

DEFINING INDIVIDUALISED CARE IN INFECTION CONTROL FOR CANCER PATIENTS: A CONCEPT ANALYSIS FOR EVIDENCE-BASED NURSING PRACTICE

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Abstract

Individualised care in infection control is increasingly recognised as central to safe, effective, patient-centred oncology nursing practice. Cancer patients face heightened infection vulnerability from immunosuppression, neutropenia, invasive devices, and prolonged hospital exposure, yet the concept of individualised infection control remains inconsistently defined and insufficiently operationalised, limiting evidence-based assessment, education, and policy development. The main objective was to clarify individualised care in infection control for cancer patients using Walker and Avant's (2011) eight-step concept analysis framework, and to propose an evidence-based definition applicable to oncology nursing practice, education, research, and policy. A concept analysis followed Walker and Avant's eight-step model. A systematic search of PubMed, Web of Science, and CINAHL (2020-2025) identified 162 records; following two-stage screening of titles, abstracts, and 50 full texts, fifteen studies were retained. Thematic synthesis extracted definitions, attributes, antecedents, consequences, and empirical referents, illustrated through model, borderline, related, and contrary cases. Four defining attributes were identified: individualised infection risk assessment and stratification; targeted, patient-specific, evidence-based infection prevention interventions; person-centred communication, patient engagement, and shared decision-making; and continuous reassessment, dynamic care adaptation, and multidisciplinary coordination. Key antecedents included nurse competency, documented patient risk profiles, enabling organisational conditions, and patient engagement readiness. Consequences included reduced healthcare-associated infection, improved quality of life and treatment adherence, enhanced self-efficacy, reduced healthcare utilisation, and strengthened nursing practice standards. Individualised care in infection control for cancer patients is a dynamic, evidence-based, risk-stratified, and patient-centred nursing practice. The proposed definition strengthens conceptual clarity, supports valid assessment and intervention frameworks, and informs oncology nursing education, practice, and policy aimed at improving infection-related outcomes, particularly in resource-limited settings such as Nigeria.

Keywords: cancer nursing; concept analysis; healthcare-associated infection; individualised care; infection control

INTRODUCTION

Cancer patients constitute one of the most infection-vulnerable populations in healthcare. Cancer and its treatment produce immunosuppression, neutropenia, mucosal barrier disruption, and haematopoietic compromise, while the care trajectory involves repeated hospital exposure, implantable vascular devices, and high-acuity environments harbouring antimicrobial-resistant organisms. Stewart et al. (2021), in a large NHS Scotland cohort, demonstrated that cancer comorbidity is among the strongest independent predictors of healthcare-associated infection (HAI) at hospital admission, establishing cancer-specific infection prevention as a clinical priority distinct from general HAI prevention.

The burden of infection extends beyond immediate morbidity: infections interrupt chemotherapy cycles, prolong hospitalisation, increase antibiotic exposure, and are associated with significant mortality. The developmental challenges of most of the economies of West African countries, Nigeria inclusive, have always made the provision of health infrastructures inadequate to meeting the needs of population health (Tinuola, 2016). Viola et al. (2023) showed that device-related infections frequently necessitate device removal and delay life-saving therapy, while Lin et al. (2025) demonstrated that standard nursing care was associated with a 24.6% HAI incidence in leukaemia patients, reduced to 12.4% through a personalised nursing pathway.

Conventional infection prevention in oncology has historically relied on universal protocol bundles applied uniformly regardless of individual risk profiles. Stewart et al. (2021) proposed a paradigm shift toward personalised infection prevention and control (IPC) targeting patients at greatest individual HAI risk from

admission. In the oncology context, Altinisik and Arikan (2022) found that more experienced oncology nurses individualise care more effectively, and that perceptual gaps between nurses and patients regarding individualised care persist. Hynnekleiv et al. (2025) further revealed that individualised nursing care in cancer settings is systematically under-documented in electronic health records, particularly the relational dimensions that most reflect genuine individualisation.

The intersection of individualised nursing care and infection control in oncology remains conceptually underdeveloped despite its clinical urgency. Although infection control and individualised care have each received substantial independent scholarly attention, their integration within cancer nursing has not been subjected to a systematic Walker and Avant concept analysis capable of identifying combined defining attributes, antecedents, consequences, and empirical referents. This conceptual gap limits the development of oncology-specific individualised IPC protocols, competency standards, and quality indicators, which this study addresses. This study is set out to conceptualize individualised care in infection control for cancer patients by identifying its core characteristics and distinguishing it from related but distinct concepts; identify the defining attributes, antecedents, and consequences of individualised care in infection control for cancer patients, to inform oncology nursing assessment, educational design, and policy development; and propose an evidence-based definition that enhances conceptual clarity and supports future research, nursing education, and practice innovation in oncology infection control.

This study is anchored in Walker and Avant's (2011) eight-step concept analysis method, comprising: selecting a concept, determining the aims of analysis, identifying uses of the concept, determining defining attributes, constructing model, borderline, related, and contrary cases, identifying antecedents and

consequences, and defining empirical referents. This structured framework enables systematic clarification of an ambiguous or under-theorised nursing concept and supports the derivation of an operational, evidence-based definition suitable for practice, education, and policy application.

METHODS

Design

This study employed Walker and Avant's (2011) eight-step concept analysis method to clarify individualised care in infection control for cancer patients, enabling systematic identification of the concept's uses, defining attributes, illustrative cases, antecedents, consequences, and empirical referents.

Literature Search and Study Selection

A comprehensive search of PubMed, Web of Science, and CINAHL was conducted using terms including individualised care cancer patients, personalised nursing oncology, infection prevention cancer nursing, neutropenia nursing infection prevention, and individualised care concept analysis, supplemented by reference list screening. A two-stage screening process was applied: 162 identified records were screened at title/abstract level, followed by full-text review of 50 articles. Fifteen studies were retained for direct relevance, methodological rigour, and conceptual contribution (see table 1). The Mixed Methods Appraisal Tool was used to assess study quality across designs; quality findings informed interpretation but did not serve as exclusion criteria, consistent with the synthesising purpose of concept analysis.

Method of Analysis

Thematic analysis was conducted across all included studies. Full-text articles were independently reviewed and coded line by line; codes were iteratively compared across studies and grouped into higher-order themes corresponding to defining attributes, antecedents, consequences, and empirical referents. Two

reviewers independently coded the data, resolving discrepancies through consensus discussion, with thematic saturation considered achieved when no new themes emerged (Walker & Avant, 2011; Braun & Clarke, 2019).

Table 1: Summary of Inclusion and Exclusion Criteria

Criteria	Inclusion	Exclusion
Concept focus	Explicit engagement with individualised/personalised nursing care or infection prevention in cancer/oncology settings	Incidental mention without conceptual or empirical engagement
Study type	Concept analyses, systematic/scoping/integrative reviews, cohort, cross-sectional, RCT, and qualitative studies	Purely theoretical papers or editorials without empirical substantiation
Context	Oncology wards, cancer centres, haematology/BMT units, inpatient and community cancer care	Non-cancer populations without oncology IPC relevance
Language / Date	English language; published 2020-2025, with allowance for foundational conceptual works	Non-English without translation; outside date range without conceptual necessity

RESULTS

Thematic synthesis of the fifteen included studies, spanning Scotland, Turkey, Norway, China, Portugal, Spain, the United States, and Iran, confirmed that individualised care in infection control for cancer patients is deployed across clinical, educational, and policy contexts with a shared commitment to moving beyond universal protocol application toward risk-stratified, patient-centred, and dynamically adapted infection prevention.

Defining Attributes

Four defining attributes were identified (Table 2). All four must be simultaneously present for individualised infection control to be fully enacted and clinically effective.

Table 2: Defining Attributes of Individualised Care in Infection Control for Cancer Patients

Defining Attribute	Description
Individualised infection risk assessment and stratification	A structured, patient-specific assessment of infection risk (cancer type/stage, immunosuppression, neutropenia severity, device presence, comorbidities, prior HAI history) that goes beyond universal precautions. Stewart et al. (2021) confirmed cancer comorbidity as a leading HAI predictor; Lin et al. (2025) showed a personalised risk assessment pathway reduced HAI incidence by 50%.
Targeted, patient-specific, evidence-based IPC interventions	Selection, adaptation, and sequencing of evidence-based interventions tailored to each patient's risk profile and clinical trajectory rather than uniform bundles (Lin et al., 2025; Cooley et al., 2023; Viola et al., 2023).
Person-centred communication, patient engagement, and shared decision-making	Communication that engages patients and families as active participants in understanding and adhering to tailored IPC measures. Elkefi and Asan (2023) confirmed that patient-centred communication improves quality of care, self-efficacy, and trust; Hynnekleiv et al. (2025) found this dimension the least documented.
Continuous reassessment, dynamic adaptation, and multidisciplinary coordination	Ongoing reassessment and real-time interprofessional coordination as risk profiles evolve across treatment cycles and device-related events (Lin et al., 2025; Bledsaw et al., 2023).

Model, Borderline, Related, and Contrary Cases

A model case illustrating full expression of the concept involved a 48-year-old woman with acute myeloid leukaemia in severe neutropenia (ANC $0.3 \times 10^9/L$) with a 12-day PICC line in situ. Her nurse conducted a structured risk assessment, activated individualised temperature-monitoring, device-care, and dietary plans,

negotiated a family-visiting protocol addressing her disclosed anxiety, and dynamically escalated precautions as her blood counts declined — the admission concluded without HAI acquisition, demonstrating all four attributes in concert.

A borderline case involved standard neutropenic-precaution protocols applied uniformly without individual risk stratification, device-specific assessment, or patient-specific communication — safe at a generic level but not individualised. A related case (individualised pharmacological medication review) shared the individualisation principle but addressed medication rather than infection risk, confirming the concept's specificity to infection-control nursing practice. A contrary case, in which a severely neutropenic patient received no risk assessment, no device monitoring, and no infection education, resulted in a preventable Hickman-line bloodstream infection — the direct antithesis of the concept (Stewart et al., 2021; Viola et al., 2023; Lin et al., 2025).

Antecedents

Antecedents operate at nurse, patient, and organisational levels (Table 3), confirming that individualised infection control is simultaneously a professional competency and a structurally enabled practice.

Table 3: Antecedents of Individualised Care in Infection Control for Cancer Patients

Antecedent	Explanation
Nurse competency and individualised assessment skills	Naghdi et al. (2021) found only 11.8% of oncology/BMT nurses had good neutropenia knowledge and only 19.2% good infection control practice, establishing the knowledge-practice gap as a critical antecedent.
Documented patient risk-profile identification	Stewart et al. (2021) and Hynnekleiv et al. (2025) confirmed that prospective, documented risk stratification enables individualised planning that generic protocols cannot achieve.
Enabling organisational conditions	López-Domingo and Rodríguez-Martín (2021) linked staffing ratios, autonomy, and leadership to individualised care delivery; Tartari et al. (2021) found only 12.5% of countries have all WHO IPC core components in place.
Patient engagement	Elkefi and Asan (2023) and Cervantes (2023) confirmed

readiness and patient capacity for engagement as a modifiable health literacy antecedent, developable through structured education.

Consequences

Consequences span clinical, psychological, economic, and professional domains (Table 4), confirming individualised infection control as a comprehensive evidence-based nursing investment rather than merely a patient-experience enhancement.

Table 4: Consequences of Individualised Care in Infection Control for Cancer Patients

Consequence	Description
Reduced HAI and treatment-related infection incidence	Lin et al. (2025) reported 50% HAI reduction, 2.6-day antibiotic reduction, and 3.2-day hospital-stay reduction; Bledsaw et al. (2023) reported reduced central-line-associated bloodstream infections through interdisciplinary care.
Improved quality of life, wellbeing, and adherence	Liu and Guo (2025) found personalised nursing significantly improved quality of life and raised treatment adherence to 91.2%; Elkefi and Asan (2023) confirmed improved quality of care and self-efficacy.
Enhanced patient self-efficacy and engagement	Elkefi and Asan (2023) and Cervantes (2023) confirmed that individualised infection education strengthens patient confidence and active participation in protective behaviours.
Reduced healthcare utilisation and cost	Connor et al. (2023) found 94% of infection-prevention-related evidence-based practices showed positive return on investment; Liang et al. (2020) confirmed reduced inpatient utilisation through patient-centred oncology care.
Strengthened nursing standards and evidence-based culture	Cooley et al. (2023) confirmed infection control as the most frequently implemented evidence-based practice topic in oncology nursing; Ryu et al. (2025) identified evidence-based knowledge as foundational to infection control nursing.

Empirical Referents

Empirical referents operationalise each defining attribute through validated instruments and clinical indicators (Table 5), enabling measurement and evaluation of individualised infection control in research and clinical audit.

Table 5: Empirical Referents of Individualised Care in Infection Control for Cancer Patients

Empirical Referent	Attribute Measured / Source
Individualized Care Scale (ICS-A/ICS-B, Nurse version)	Person-centred communication and engagement (Altinisik & Arikan, 2022; Ramos et al., 2024a)
Personalised infection risk assessment protocol (ANC, PICC status, HAI risk score)	Individual risk stratification (Stewart et al., 2021; Lin et al., 2025)
EORTC QLQ-C30 / Hospital Anxiety and Depression Scale	Treatment adherence and quality-of-life consequences (Liu & Guo, 2025; Elkefi & Asan, 2023)
WHO Infection Prevention and Control Assessment Framework (IPCAF)	Organisational IPC infrastructure antecedent (Tartari et al., 2021; Azak et al., 2023)
Neutropenia knowledge questionnaire and IPC practice checklist	Nurse competency antecedent (Naghdi et al., 2021)
HAI surveillance and antibiotic-use-duration tracking	Primary consequence referents (Lin et al., 2025; Wall et al., 2022)

DISCUSSIONS

This concept analysis proposes that individualised care in infection control for cancer patients is a dynamic, risk-stratified, patient-centred, and evidence-grounded nursing practice in which oncology nurses systematically identify each patient's unique infection vulnerability, deliver targeted evidence-based interventions, engage patients and families as informed partners, and continuously adapt care through multidisciplinary coordination. This positions individualised infection control as both a clinical safety strategy and a comprehensive nursing practice model.

Lin et al.'s (2025) retrospective cohort evidence, demonstrating a 50% HAI reduction through a personalised nursing pathway, translates directly to Nigerian tertiary hospital oncology settings, where haematological malignancies are increasingly prevalent and infrastructure constraints may elevate baseline HAI risk. Stewart et al.'s (2021) identification of cancer comorbidity as a leading HAI predictor provides the epidemiological rationale for prioritising individualised infection control in cancer populations specifically.

Naghdi et al.'s (2021) finding that only 11.8% of oncology nurses demonstrated good neutropenia knowledge is particularly significant for the Nigerian and broader West African context, where oncology-specific infection control training is not consistently embedded in nursing curricula. This knowledge-practice gap constitutes the most modifiable antecedent identified in this analysis, and its remediation through structured continuing professional education is the most immediately actionable recommendation arising from this study. Altinisik and Arikan's (2022) finding that nurses' perceptions of individualised care exceed those of their patients raises an important alignment concern: nurses who believe they deliver individualised care while patients experience it as standardised operate with a professional blind spot with direct consequences for adherence and trust. Hynnekleiv et al. (2025) confirmed the structural dimension of this gap — documentation systems designed for efficiency rather than person-centred individualisation render the relational dimensions of care systematically invisible.

The global infrastructure findings of Tartari et al. (2021) and Azak et al. (2023), showing that only a minority of countries have all WHO IPC core components in place, confirm that individualised infection control for Nigerian oncology nursing must proceed alongside, not instead of, investment in structural IPC prerequisites such as surveillance systems, staffing, and training. Individualised care in

infection control must also be distinguished from related constructs: standard universal precautions are a necessary component but lack risk stratification; personalised medicine operates at the treatment-prescription rather than nursing-care level; and person-centred care is a broader philosophy of which individualised infection control is a specific clinical application.

Proposed Evidence-Based Definition

Individualised care in infection control for cancer patients is a dynamic, risk-stratified, patient-centred, and evidence-grounded nursing practice in which oncology nurses systematically assess each patient's unique infection vulnerability through structured multi-domain assessment, deliver targeted evidence-based interventions tailored to that individual's risk factors and clinical trajectory, engage patients and families as active partners through person-centred communication, and continuously reassess and adapt care through multidisciplinary coordination — with the purpose of reducing infection incidence, improving treatment adherence, enhancing quality of life and self-efficacy, and advancing evidence-based oncology nursing standards. Corroborating the above, Tinuola (2021) in a study, observed that risk behavior, an indulgence in any action or activity that can cause potential harm to the individual as a consequence of whatever he chooses to do is a major consideration in the epidemiology of chronic diseases.

CONCLUSION

This concept analysis clarifies individualised care in infection control for cancer patients as a dynamic, risk-stratified, patient-centred, and evidence-grounded nursing practice encompassing individualised risk assessment, targeted evidence-based interventions, person-centred communication, and continuous multidisciplinary reassessment. Drawing on fifteen studies across multiple international settings, the analysis distinguishes this concept from standard universal precautions, personalised medicine, and general person-centred care, and

provides a robust conceptual and definitional foundation for oncology nursing research, education, and policy, including within resource-limited settings such as Nigeria.

RECOMMENDATIONS

- i. Oncology nursing curricula should embed structured content on neutropenia management, individual infection risk assessment, and person-centred communication as core competencies, addressing the knowledge-practice gap identified by Naghdi et al. (2021).
- ii. Hospitals should adopt structured individual infection risk assessment tools at cancer patient admission and require documented, individualised infection prevention care plans as a component of oncology nursing quality standards.
- iii. Healthcare policymakers, particularly in Nigeria and sub-Saharan Africa, should invest concurrently in nursing competency development and structural IPC infrastructure (surveillance systems, staffing, training), consistent with the findings of Tartari et al. (2021) and Harun et al. (2022).
- iv. Future research should test and validate the proposed definition through intervention trials measuring the effect of individualised infection control nursing pathways on HAI incidence, treatment adherence, and quality of life in Nigerian oncology settings, using the empirical referents identified in this analysis.

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