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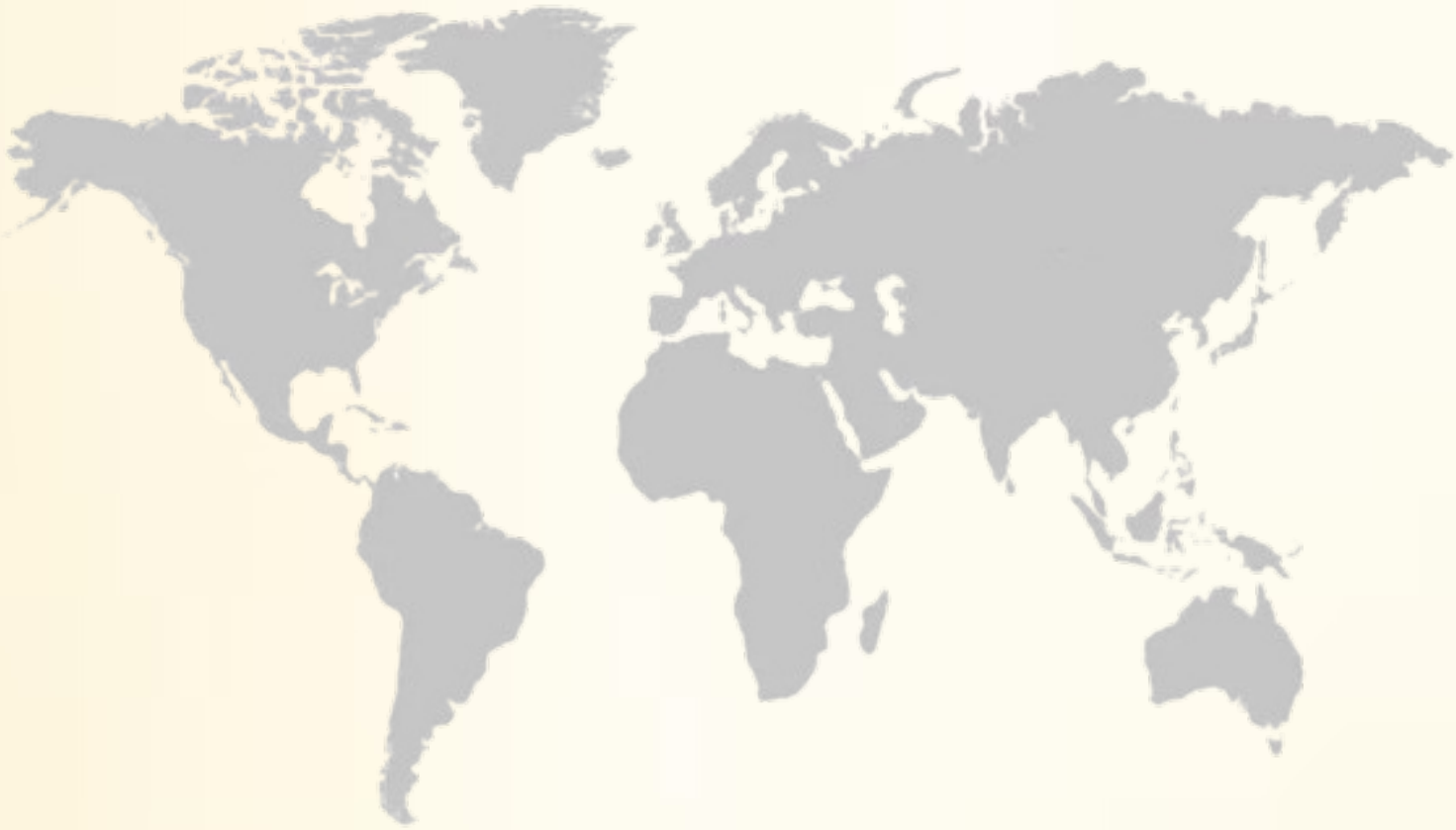

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Usability and User Experience Evaluation of a Geriatric Care Screening Tool for Nursing Practice

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Abstract

Background: Population aging continues to intensify the demand for comprehensive geriatric nursing assessments, particularly in primary care and community health settings. In many contexts, these assessments are still performed manually, which can be time-consuming, prone to documentation errors, and difficult to integrate into ongoing care planning. Digital screening tools may help address these challenges; however, their effectiveness largely depends on usability and user experience among frontline nurses.
Objective: This study aimed to evaluate the usability and user experience of the Geriatric Care Screening Tool, a digital application developed to support geriatric nursing assessments, from the perspective of nurse users.
Methods: A usability and user experience evaluation study was conducted using a descriptive quantitative design within a user-centered development framework. Twenty nurses involved in geriatric nursing services participated in the evaluation. User needs were explored through a focus group discussion (FGD), followed by expert content validation of the application. Usability was assessed using the System Usability Scale (SUS), while user experience was evaluated using the User Experience Questionnaire (UEQ). Data were analyzed descriptively and interpreted using established benchmark standards.
Results: The mean SUS score was 70.38, indicating marginally acceptable usability with a "Good" adjective rating. UEQ results showed positive user experience across all dimensions. The highest scores were observed in Clarity (1.75), Accuracy (1.20), and Stimulation (1.04). Lower scores were identified in Attractiveness (0.73), Efficiency (0.86), and Novelty (0.65), suggesting areas that require further improvement, particularly related to interface design, navigation speed, and innovative features.
Conclusion: The Geriatric Care Screening Tool demonstrated acceptable usability and a generally positive user experience among nurses. While the application meets basic functional requirements for geriatric nursing assessment, further refinement—particularly in efficiency, visual design, and innovation—is needed to optimize its use in clinical and community practice.

Keywords: Usability; user experience; digital health application; geriatric nursing; nursing assessment

INTRODUCTION

Population ageing has emerged as a major global public health challenge, requiring health systems to adapt to the increasingly complex and multidimensional needs of older adults. The World Health Organization (WHO) has emphasized that ageing populations are

characterized by a higher prevalence of multimorbidity, functional decline, cognitive impairment, and social vulnerability, necessitating integrated, person-centred, and longitudinal care approaches (1,2). In Indonesia, demographic transition toward an ageing society is progressing rapidly. National data indicate that older adults accounted for 11.75% of the total population in 2023, reflecting a significant increase compared to previous decades and signalling growing demand for geriatric health services (3,4).

Within this demographic context, nurses play a central role in the delivery of geriatric care, particularly in primary care and outpatient settings. Nurses are often responsible for early identification of health risks, monitoring functional status, coordinating multidisciplinary care, and supporting older adults' independence and quality of life. A core strategy underpinning effective geriatric nursing practice is comprehensive geriatric assessment (CGA), a structured, multidimensional process that evaluates medical, functional, psychological, and social domains to inform individualized care planning (5,6). Systematic reviews and meta-analyses consistently demonstrate that CGA can improve functional outcomes, optimize care planning, and support continuity of care when appropriately implemented (5).

Despite its recognized importance, the practical implementation of structured geriatric assessment in routine nursing practice remains challenging, particularly in settings that rely on paper-based documentation systems. Manual documentation is frequently associated with inefficiencies, data duplication, limited accessibility, and increased risk of incomplete or inaccurate records, all of which may hinder follow-up care and continuity across services (7). In Indonesia, evidence indicates that paper-based nursing documentation remains predominant, with limited adoption of fully electronic or digital assessment systems in many health facilities (8). These limitations are particularly salient in geriatric care, where assessments often involve repeated measurements across multiple domains and require longitudinal tracking.

Digital health applications offer substantial potential to address these challenges by enabling standardized data collection, automated scoring, secure storage, and real-time access to patient information. Digital assessment tools in geriatric nursing facilitate systematic capture of physical and activity metrics in older adults, enhancing efficiency, decreasing the documentation burden, and offering clinicians integrated and interpretable data to guide timely clinical decisions (9). However, evidence from health informatics research consistently highlights that the benefits of digital systems are not inherent to technology itself but depend critically on usability and user experience. Poorly designed systems may disrupt workflows, increase cognitive load, and reduce acceptance among nurses, ultimately limiting sustained use and undermining intended improvements in care quality (7).

Usability, defined as the extent to which a system can be used effectively, efficiently, and satisfactorily by specified users, is widely recognized as a prerequisite for successful digital health implementation. One of the most frequently used instruments to assess perceived usability in healthcare and human–computer interaction research is the System Usability Scale (SUS), which provides a reliable and efficient global usability score across diverse technologies and user groups (10). Complementing usability, user experience (UX) captures broader perceptions of a system, including pragmatic quality (e.g., efficiency, clarity) and hedonic quality (e.g., attractiveness, stimulation). The User Experience Questionnaire (UEQ) has been widely applied to assess these dimensions and has demonstrated robustness across cultural contexts, including recent validation studies in Indonesia (11).

Although digital tools for geriatric assessment are increasingly promoted to strengthen nursing services, important implementation-level evidence gaps remain. First, while CGA is well established conceptually, its operationalization in routine nursing workflows—particularly through digital platforms—varies considerably across settings (5). Second, in Indonesia and similar contexts, empirical evaluations of usability and user experience of digital geriatric assessment tools designed specifically for nurses are still limited, especially prior to large-scale implementation. Existing studies often focus on clinical effectiveness or general electronic health records, rather than on nurse-centred assessment tools that support geriatric screening and documentation (7). Without rigorous usability and UX evaluation, digital systems risk increasing documentation burden and resistance among users rather than facilitating high-quality geriatric nursing care.

To address this evidence gap, the Geriatric Care Screening Tool was developed to support nurses in conducting structured geriatric assessments digitally. Before broader implementation or effectiveness testing, it is essential to evaluate whether the tool is usable, acceptable, and aligned with nursing workflows. Therefore, this study aimed to assess the usability and user experience of the Geriatric Care Screening Tool among nurses, using the System Usability Scale (SUS) (12). Generating this evidence is expected to inform iterative refinement of the tool and support its feasibility for integration into geriatric nursing practice.

METHODS

Study Design

This study employed a quantitative, cross-sectional usability and user experience evaluation design. The design was selected in accordance with international recommendations for early-phase digital health research, which emphasize usability and user experience assessment prior to large-scale implementation or effectiveness testing. This approach allows systematic evaluation of whether a digital tool is acceptable, practical, and aligned with users' workflows before further clinical or implementation studies are conducted.

Setting

The study was conducted in outpatient and primary care services providing routine geriatric care, where nurses are responsible for conducting initial geriatric screening and documentation. The setting reflects real-world nursing workflows in which comprehensive geriatric assessment is performed as part of routine care, ensuring ecological validity of the usability and user experience evaluation.

Participants and Sampling

The study participants were registered nurses who were directly involved in geriatric assessment and documentation in outpatient or primary care services. Inclusion criteria were registered nurse status, active involvement in geriatric nursing care, and willingness to use the Geriatric Care Screening Tool during the evaluation period. Nurses who were not involved in geriatric assessment activities or who declined participation were excluded.

A convenience sampling strategy was used, which is considered appropriate for usability and user experience studies aimed at identifying interaction quality, workflow fit, and perceived usability rather than estimating population-level prevalence or causal effects. Previous usability research indicates that samples of 20–50 users are sufficient to identify the majority of usability issues and generate stable usability scores for standardized instruments.

Digital Tool: Geriatric Care Screening Tool

The Geriatric Care Screening Tool is a digital application designed to support nurses in conducting structured geriatric screening. The tool integrates standardized assessment domains commonly used in geriatric nursing, including functional status, mobility, cognitive screening, nutritional risk, and psychosocial indicators. The system enables structured data entry, automated scoring, and secure digital storage to facilitate continuity of care and follow-up monitoring.

Prior to this study, the tool underwent internal functional testing to ensure technical stability. However, no formal usability or user experience evaluation had been conducted, justifying the present study as an essential preparatory phase before broader implementation.

Instruments

System Usability Scale (SUS)

Usability was assessed using the System Usability Scale (SUS), a widely used and validated instrument for evaluating perceived usability of digital systems. The SUS consists of 10 items rated on a 5-point Likert scale, yielding a total score ranging from 0 to 100, with higher scores indicating better perceived usability. The SUS has demonstrated robust reliability and validity across healthcare and digital health contexts and is recommended for rapid usability evaluation of health information systems (13,14).

User Experience Questionnaire (UEQ)

User experience was assessed using the User Experience Questionnaire (UEQ), which measures six dimensions of user experience: attractiveness, perspicuity, efficiency, dependability, stimulation, and novelty. The UEQ captures both pragmatic quality (task-oriented aspects) and hedonic quality (emotional and experiential aspects), providing a comprehensive evaluation of how users perceive interaction with a digital system. The UEQ has been validated across multiple cultural contexts, including Indonesia, supporting its appropriateness for this study.

Sociodemographic and Professional Characteristics

A brief questionnaire was used to collect participants' demographic and professional characteristics, including age, gender, years of nursing experience, and prior experience with digital health systems. These data were collected to contextualize usability and user experience findings.

Data Collection Procedure

Participants were introduced to the Geriatric Care Screening Tool and provided with a brief standardized orientation on its functions. Nurses were then asked to use the tool as part of simulated or routine geriatric assessment tasks, reflecting typical clinical workflows. After completing the assigned tasks, participants independently completed the SUS and UEQ questionnaires. All data were collected anonymously to minimize social desirability bias and encourage honest feedback regarding system usability and user experience.

Data Analysis

Data were analyzed using IBM SPSS Statistics (version 27) and UEQ analysis tools following instrument developers' guidelines. Descriptive statistics (mean, standard deviation, median, and interquartile range) were used to summarize SUS scores and UEQ dimension scores. SUS scores were interpreted using established benchmarks, where scores ≥68 indicate above-average usability. UEQ results were interpreted by comparing dimension scores to established UEQ benchmark ranges, categorizing user experience as excellent, good, above average, below average, or poor.

Ethical Considerations

Ethical approval for this study was obtained from an institutional ethics committee prior to data collection (III/098/KEPK/STIKep/PPNI/Jabar/III/2024). All participants received written and verbal information about the study objectives, procedures, voluntary nature of participation, and data confidentiality. Written informed consent was obtained from all participants. Participant anonymity was maintained by assigning unique codes, and no identifiable personal information was recorded. Data were stored securely and used solely for research purposes in accordance with ethical principles of respect for persons, beneficence, and justice.

RESULTS

Figure 1 presents the radar chart of mean UEQ scores across the six user experience dimensions. Radar chart of mean User Experience Questionnaire (UEQ) dimension scores for the Geriatric Care Screening Tool as evaluated by nurses (n = 20). Scores range from −3 (very negative) to +3 (very positive), with higher values indicating more favorable user experience. Overall, the Geriatric Care Screening Tool demonstrated consistently positive user experience, with all dimensions scoring above the neutral benchmark value of 0.8.

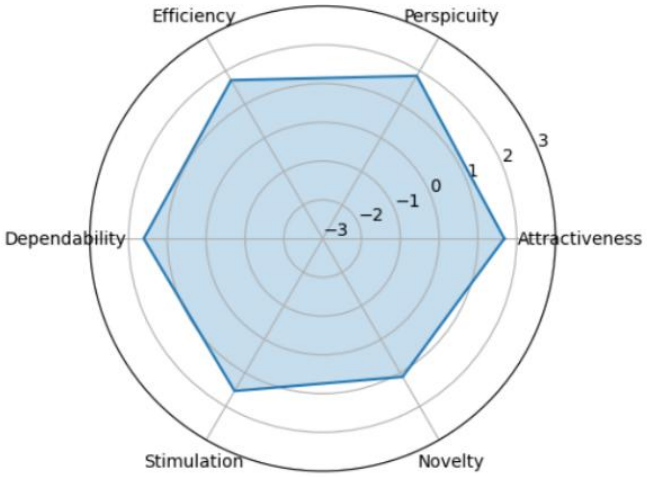

Table 1. User Experience Questionnaire (UEQ) Dimension Scores for the Geriatric Care Screening Tool (n = 20)

UEQ Dimension	Mean (M)	Standard Deviation (SD)	Benchmark Category*
Attractiveness	1.68	0.40	Excellent
Perspicuity	1.85	0.42	Excellent
Efficiency	1.72	0.38	Excellent
Dependability	1.61	0.45	Excellent
Stimulation	1.54	0.47	Above Average
Novelty	1.12	0.51	Above Average

The highest mean score was observed in the perspicuity dimension (M = 1.85, SD = 0.42), indicating that nurses perceived the system as easy to understand and learn. This was followed by efficiency (M = 1.72, SD = 0.38) and dependability (M = 1.61, SD = 0.45), suggesting that the tool supported task completion effectively and was perceived as reliable and predictable during use. The attractiveness dimension also demonstrated a high mean score (M = 1.68, SD = 0.40), reflecting an overall positive impression of the system. The stimulation dimension showed a moderately high score (M = 1.54, SD = 0.47), indicating that nurses found the system engaging and motivating to use. The lowest, though still positive, score was observed for novelty (M = 1.12, SD = 0.51), suggesting that while the system was perceived as sufficiently innovative, its primary strengths were related to pragmatic rather than exploratory or creative qualities (Table 1).
According to established UEQ benchmarks, perspicuity, efficiency, dependability, and attractiveness fell within the excellent range (>1.5), while stimulation and novelty were classified as above average (0.8–1.5). Collectively, the radar chart demonstrates a balanced and favorable user experience profile, supporting the usability and acceptability of the Geriatric Care Screening Tool for geriatric nursing assessment (Table 1).

DISCUSSION

This study evaluated the user experience of the Geriatric Care Screening Tool among nurses using the User Experience Questionnaire (UEQ). Overall, the findings demonstrate a consistently positive user experience profile across all six UEQ dimensions, with all mean scores exceeding the established positive benchmark (>0.8). These results indicate that nurses perceived the tool favorably and considered it suitable for use in routine geriatric nursing assessment.

Among the six dimensions, perspicuity achieved the highest mean score, suggesting that the system was perceived as easy to understand and learn. This finding is particularly important in clinical nursing environments, where limited time and high workload constrain opportunities for extensive training. High perspicuity indicates that the tool supports rapid onboarding and intuitive use, which are essential factors for adoption in primary care and outpatient settings (11,12)

Similarly, efficiency and dependability demonstrated excellent benchmark classifications. These dimensions reflect the system's ability to support task completion with minimal effort and to operate in a predictable and reliable manner. In the context of geriatric nursing documentation, where assessments involve multiple domains and repeated follow-up, efficiency and reliability are critical to reducing workflow disruption and documentation burden (7,15).

The attractiveness dimension also showed a high mean score), indicating a positive overall impression of the system. Positive affective responses to digital tools have been shown to influence continued use and acceptance, particularly when users are not mandated to adopt a system (10,16).

In contrast, stimulation and novelty were comparatively lower, although both remained within positive benchmark ranges. This pattern strong pragmatic quality accompanied by moderate hedonic quality is typical of clinical information systems, where users tend to prioritize clarity, efficiency, and reliability over innovation or creativity (12,17). The relatively lower novelty score suggests that the primary strengths of the tool lie in functional usability rather than exploratory or innovative features, which is appropriate for clinical assessment applications.

The findings of this study are consistent with prior research emphasizing that usability and workflow alignment are key determinants of digital health tool acceptance among clinicians. Systematic reviews of usability evaluation in hospital information systems consistently report that ease of learning, efficiency, and system reliability are the strongest predictors of user satisfaction and sustained use (18,19).

Evidence from nursing-focused studies further supports these results. Research on electronic health record (EHR) use among nurses has shown that poor usability contributes to documentation burden, increased cognitive load, and dissatisfaction, whereas well-designed systems can support efficiency and perceived safety (20,21). The high scores observed in perspicuity, efficiency, and dependability in this study suggest that the Geriatric Care Screening Tool addresses several usability issues commonly associated with paper-based or poorly designed electronic documentation systems.

From a methodological perspective, the use of UEQ aligns with recent cross-cultural usability research. Validation studies of UEQ-family instruments in Indonesia have demonstrated their applicability and reliability in evaluating user experience across digital systems, supporting the appropriateness of UEQ for assessing nurse-facing health technologies in the Indonesian context (11,14).

Clinical and Implementation Implications

The results of this study have several implications for geriatric nursing practice and digital health implementation. Facilitating adoption in routine practice: High perspicuity suggests that nurses can use the tool effectively with minimal training, which is essential for scalability in resource-constrained settings. Reducing documentation burden: Strong efficiency and dependability scores indicate that the tool may help streamline geriatric assessment documentation and reduce duplication and errors associated with paper-based systems. Supporting continuity and quality of care: Structured, reliable digital documentation can enhance longitudinal monitoring of older adults' functional status, supporting continuity of care and informed clinical decision-making. Guiding iterative development: The comparatively lower novelty score indicates that future development should prioritize maintaining pragmatic strengths while selectively enhancing engagement features only if they support clinical tasks. Importantly, this usability and user experience evaluation provides foundational evidence to support further refinement and subsequent effectiveness or implementation studies.

Study Limitations

This study has several limitations. First, the sample size (n = 20) is appropriate for a pilot usability and user experience evaluation but limits generalizability. Second, participants were recruited from a single clinical context, which may not reflect usability perceptions in other healthcare settings with different workflows or digital maturity. Third, the study relied on self-reported UEQ data; future research should incorporate objective usability metrics, such as task completion time and error rates, as well as qualitative methods to capture deeper insights into user interaction. Finally, this study did not assess downstream clinical outcomes or documentation burden reduction, which should be explored in subsequent implementation studies.

CONCLUSION

This study demonstrates that the Geriatric Care Screening Tool exhibits a favorable and balanced user experience profile, with all User Experience Questionnaire (UEQ) dimensions exceeding established positive benchmark thresholds. The tool performed particularly well in pragmatic dimensions, including perspicuity, efficiency, dependability, and attractiveness, indicating that nurses perceived the system as easy to learn, efficient to use, reliable in supporting clinical tasks, and acceptable for integration into routine geriatric nursing practice. High perspicuity is especially important in clinical environments where limited time and heavy workloads restrict opportunities for extensive training. Similarly, strong efficiency and dependability suggest that the tool aligns well with nursing workflows and may reduce documentation burden compared with conventional paper-based assessments.

Although novelty received comparatively lower scores, it remained within the positive range, reflecting that the tool prioritizes functional usability over innovative or exploratory features. This design emphasis is appropriate for clinical assessment applications, where clarity and reliability are generally valued more highly than visual novelty. Overall, the findings support the

usability and acceptability of the Geriatric Care Screening Tool as a digital approach to structured geriatric nursing assessment. Importantly, this study provides foundational usability and user experience evidence to guide iterative system refinement. Future research should evaluate the tool's impact on clinical efficiency, documentation quality, and patient-related outcomes, as well as assess its scalability and implementation feasibility in broader healthcare settings

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Author Contributions
VL: Conceptualization, study design, development coordination of the Geriatric Care Screening Tool, data collection, data analysis and interpretation, manuscript drafting, and final approval.
NAM: Methodology support, usability and user experience analysis, interpretation of findings, and critical manuscript revision.
FF: Data collection, user evaluation coordination, literature review, and critical revision of the manuscript.

Conflict of Interest
The authors declare that there is no conflict of interest related to this study.

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