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Development and Psychometric Evaluation of an Integrated Android-Based Application for Non-Communicable Disease Prevention and Management

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Abstract

Background: The rising prevalence of non-communicable diseases (NCDs) necessitates the development of innovative digital healthcare solutions to improve prevention and self-management. This study developed and evaluated an Android-based application for NCD prevention and management, focusing on feasibility, validity, and reliability.

Methods: A research and development (R&D) approach was utilized, comprising four stages: define, design, develop, and disseminate. The application underwent expert feasibility testing with nursing experts, community specialist physicians, contextual experts, and program managers. Construct validity was determined using item-total correlation (Pearson), and reliability was assessed with Cronbach's alpha. Additionally, a small-scale user trial with 40 participants evaluated ease of use, appearance, satisfaction, and overall usability using a 17-item Likert-scale instrument. The application achieved high feasibility, with an overall score of 86.4%.

Results: All items met established validity and reliability criteria. User testing further indicated strong acceptance, favorable usability, high user satisfaction, and a positive interface evaluation.

Conclusion: In summary, the Android-based NCD application is feasible, valid, and reliable for supporting the prevention and management of non-communicable diseases. Larger-scale studies are warranted to assess its effectiveness in improving health behaviors and outcomes.

Keywords: Android-Based Application, Non-Communicable Diseases (NCDs), Reliability, Validity

BACKGROUND

Non-communicable diseases (NCDs) represent the leading cause of death globally, accounting for approximately 74% of all deaths and resulting in more than 43 million fatalities annually (1). In Indonesia, NCDs continue to pose a significant public health challenge and are among the primary contributors to mortality. According to the Indonesian National Health Survey Report, hypertension, stroke, and diabetes mellitus are the predominant NCDs contributing to mortality. Among individuals aged 15 years and older, the prevalence of hypertension is 22.2%, while diabetes mellitus stands at 10.5%. The report further indicates that hypertension (61.6%) and diabetes (34.2%) are the leading underlying causes of death, with complications from hypertension, such as stroke, accounting for a mortality rate of 52.5% (2).

Provincial Health Profile data indicate that Central Java exhibits a high prevalence of NCDs, with hypertension comprising 73.1% of reported cases, followed by diabetes mellitus at 8.7%, and stroke at 1% (3). In Salatiga, hypertension and diabetes mellitus remain the predominant NCDs. The Salatiga City Health Profile for 2024 recorded 62,179 individuals with hypertension and 6,013 with diabetes (4). The high prevalence of these conditions in urban areas such as Salatiga underscores the need for targeted and measurable local interventions. Without appropriate and sustainable management, these conditions pose a significant risk of fatality and disability.

The substantial prevalence of hypertension and diabetes in urban areas such as Salatiga highlights a significant burden of NCDs and the necessity for targeted local interventions. In addition to affecting population health, the NCD burden threatens the sustainability of health systems and economic development, making NCD prevention a global priority within the Sustainable Development Goals (SDGs) (5,6). While promotive and preventive strategies, such as health education, early screening, and continuity of care, are essential, their implementation remains inadequate in many contexts. Digital health technologies have emerged as a promising approach to expand service coverage and improve community engagement. Nevertheless, despite the growing adoption of mobile health applications, their effectiveness in NCD management remains limited (7). Most current applications are limited to single functions, such as education or monitoring, and do not integrate screening, education, and follow-up care (8). This gap underscores the need for comprehensive digital health solutions for NCD management.

Many existing health applications have not undergone rigorous evaluations of content validity and reliability, which are essential for scientific research and clinical implementation (9,10). Previous studies have often limited health app functionality to a single feature (11,12). Additionally, assessment methodologies frequently rely solely on general expert opinion, lacking multidisciplinary perspectives that integrate clinical, engineering, and usability expertise. As a result, cross-disciplinary evaluation of NCD applications remains uncommon (13,14,15). Validated instruments such as the Mobile App Rating Scale (MARS) and the mHealth App Usability Questionnaire (MAUQ) are widely used to assess the quality and usability of mHealth applications, including engagement, functionality, aesthetics, information quality, and user satisfaction (16,17). However, these tools primarily address user experience and general app performance, with limited focus on rigorous psychometric evaluation, particularly construct validity and reliability. This limitation highlights the need for comprehensive measurement frameworks, such as the Consensus-based Standards for the Selection of Health Measurement Instruments (COSMIN), which provide standardized guidelines for assessing validity, internal consistency, and reliability (18). Integrating such frameworks is crucial to ensure that mHealth applications are not only functional and user-friendly but also scientifically robust and suitable for clinical and research use. This research is novel in developing an Android-based health application that integrates three essential components of NCD control: education, risk screening, and home follow-up care. Methodologically, this application is expected to generate stronger scientific evidence than

previous NCD app research, which has generally focused only on functional or usability aspects, thereby addressing the specific needs of the Salatiga community. The objective of this study is to develop, validate, and assess the reliability of an Android-based health application that integrates NCD education, risk screening, and home follow-up care services to support comprehensive prevention and management of non-communicable diseases.

METHODS

Study Design

This study uses a Research and Development (R&D) approach to develop an Android-based health application integrated into the prevention and control of non-communicable diseases (NCDs), comprising NCD education features, NCD screening, and home care services. The Dick and Carey model was adopted because it provides a systematic, iterative framework suitable for developing an Android-based health application. Its structured stages, including needs analysis, design, revision, and evaluation, align with the process required to develop, validate, and refine integrated features for education, screening, and follow-up care services, which is then simplified into four main stages: Define, Design, Develop, and Disseminate (17-19). *Define stage*:user needs and the local context of Salatiga City were analyzed as the basis for application development. *Design stage*: the application prototype was systematically designed, including the application structure, user flow, and interface. *Develop stage*: The application was refined based on validation and user testing results prior to dissemination.

Setting and Participants

A small-scale trial was conducted with 40 respondents in the Gandu village area. The village locations were selected purposively because the application is intended for the general public and requires testing with users with varying health literacy, technology use habits, and socio-cultural contexts to realistically assess content understandability and ease of use. The small-scale user trial involving 40 participants was conducted as part of the development phase and also used to assess preliminary construct validity and internal consistency reliability. Therefore, the findings from this stage should be interpreted as initial psychometric evidence to support application refinement prior to larger-scale validation (22).

The inclusion criteria for this study included respondents aged 15–60 years, able to operate an Android smartphone, and willing to participate by providing informed consent. The exclusion criteria included respondents who were unable to read, had visual impairments, did not complete the user trial, or withdrew their consent during data collection.

Instrument

The research instrument employed in this study was a product assessment tool derived from a small-scale user trial to evaluate the application's quality. This assessment tool comprised 17 items addressing three primary aspects: ease of use, interface, satisfaction, and usability. Each item was rated on a 1–5 Likert scale. The instrument was developed and adapted from the mHealth App Usability Questionnaire (MAUQ) to suit the context of the Android-based NCD application, and it underwent preliminary construct validity and reliability testing during the user trial.

Data Analysis

Expert Test: Expert tests were conducted using the Expert Feasibility Evaluation. The multidisciplinary expert panel assessed various aspects in their respective fields. This approach enables a comprehensive evaluation of product feasibility. Evaluation results included assessment scores from

each expert on a Likert scale of 1 to 5, the average and percentage of feasibility per expert, feasibility categories, and a summary of input and revision recommendations for each feature. Percentage scores were calculated as (obtained score/maximum score) × 100%. Feasibility levels were interpreted using the following percentage criteria: 90–100% (very feasible), 80–89% (feasible), 70–79% (quite feasible), 60–69% (less feasible), and less than 60% (not feasible) (23,24).

Construct Validity*:* Construct validity testing continues after the expert test, as the expert test evaluates the product's feasibility conceptually and substantively. In contrast, construct validity ensures that each instrument item accurately represents the construct being measured, based on actual user responses (25,26). Construct validity was assessed using Pearson item-total correlations in SPSS version 25. Items were considered valid if they met the following criteria: a calculated r (rxy) greater than the r table value (0.312), a significance value (p) less than 0.05, and a positive correlation coefficient, indicating a unidirectional relationship between item scores and the total construct score.

Internal Consistency Reliability: Instrument reliability, defined as measurement consistency, was assessed using Cronbach's alpha (27). A minimum threshold of 0.70 was set for acceptable internal consistency. An Exploratory Factor Analysis (EFA) was not conducted because the small-scale user trial included only 40 participants during the development phase. This sample size was deemed suitable for preliminary usability, construct validity, and reliability testing, but insufficient for stable factor analysis, which typically requires a larger sample (28,29).

Ethical Considerations

This research has obtained approval from the Ethics Committee of the Faculty of Health Sciences, Satya Wacana Christian University, with the number: No. 016/KOMISIETIK/EC/7/2025. The entire research process was carried out in accordance with research ethics principles, including obtaining informed consent, maintaining the confidentiality of respondents' data, and ensuring respondents' right to withdraw at any time.

RESULT AND DISCUSSION

RESULT

During the development phase, the Android-based health application for non-communicable diseases (NCDs) underwent a systematic feasibility evaluation and quality testing process. Expert feasibility evaluation was conducted to assess content suitability, clinical relevance, and the completeness and feasibility of the application's features. In addition, the application assessment instrument was tested in a limited user trial with 40 respondents and subsequently analyzed using construct validity testing with Pearson correlation and reliability testing using Cronbach's Alpha. This section presents expert assessments for each feature, a summary of the overall expert feasibility of the NCD application, and results from construct validity and instrument reliability tests based on user data.

Table 1. Expert Feasibility Evaluation Results on PTM education features

Expert	Number of Items	Total Score	Mean Score	Percentage	Category	Recommendations
NCD Manager	5	21	4.20	84%	Feasible	Need to add the latest data sources, add educational videos, and complete risk factors.
Community Specialist	5	20	4.00	80%	Feasible	Add local risk factors, complete materials (nutrition therapy, ROM videos, FAST images), improve statement consistency, and reduce text.

Nursing Specialist	5	21	4.20	84%	Feasible	Add information on the golden time for stroke.
NCD Website Manager	5	23	4.60	92%	Highly feasible	Add a back button and data security.
Contextual Expert	5	16	3.20	64%	Moderately feasible	Improve EYD, simplify unfamiliar terms, clarify local context, and conduct a small-scale trial.

The expert evaluation of the PTM educational media shows feasibility scores ranging from 64% to 92%, indicating differences in assessment across expert groups. The highest score was given by the NCD Website Manager (92%, highly feasible), indicating that the website functions very well, although improvements are still needed in navigation (e.g., adding a back button) and data security. Three experts—the NCD Manager (84%), Nursing Specialist (84%), and Community Specialist (80%)—rated the product as feasible, meaning the content is generally appropriate for PTM management, nursing practice, and community use. However, they suggested several improvements, including updating data sources, adding educational videos and visual materials (such as ROM exercises and FAST stroke signs), including information about stroke golden time, and simplifying and improving the consistency of the language. The Contextual Expert gave the lowest score (64%, moderately feasible), indicating that the content still needs improvement in local context, simpler language, correct use of EYD, and better user understanding. A small-scale trial was also recommended before wider implementation. Overall, the results show that the PTM educational media is highly feasible, but still requires improvements, especially in content simplification, contextual relevance, and technical refinement.

Table 2. Expert Feasibility Evaluation Results for the PTM screening feature

Expert	Number of Items	Total Score	Mean Score	Percentage	Category	Recommendations
NCD Manager	5	25	5.00	100%	Highly feasible	Add screening history, uric acid and cholesterol (optional), and physical activity limits.
Community Specialist	5	21	4.20	84%	Feasible	Add GDS/GDP/2PP screening, clarify BMI categories, and print or send results to the app user's WhatsApp.
Nursing Specialist	5	25	5.00	100%	Highly feasible	No substantial revisions (already good).
NCD Website Manager	5	23	4.60	92%	Highly feasible	Enlarge fonts and improve design.
Contextual Expert	5	19	3.80	76%	Feasible	Simplify long sentences and reduce unfamiliar terms.

Expert assessments of the NCD screening feature indicated high feasibility, with an average score of 76–100%. NCD managers and nursing experts rated the feature as highly feasible, emphasizing the completeness of the materials, including screening history, uric acid, cholesterol, and physical activity limits. Community physicians recommended adding GDS/FBG/2PP screening, clarifying BMI categories, and offering the option to print or send results via WhatsApp. Web managers highlighted improvements to the design and font size, while contextual experts emphasized simplifying long sentences and reducing unfamiliar terms. Overall, the feature is ready for implementation, with improvements to the content and interface to improve effectiveness and readability for users.

Table 3. Expert Feasibility Evaluation Results for Homecare Service Features

Expert	Number of Items	Total Score	Mean Score	Percentage	Category	Recommendations
NCD Manager	5	24	4.80	96%	Highly feasible	Complete cohort information or service history, and improve the map navigation button.
Community Specialist	5	23	4.60	92%	Highly feasible	Complete cohort information or service history and improve the map navigation button
Nursing Specialist	5	25	5.00	100%	Highly feasible	No substantial revisions (features are appropriate and valuable).
NCD Website Manager	5	20	4.00	80%	Feasible	Implement photo censorship, improve visual design, and adjust the back button position so it's not at the bottom.
Contextual Expert	5	18	3.60	72%	Feasible	Adjust local context to make it more relevant and accessible to users.

Expert evaluations of the NCD service features demonstrated high feasibility, with average scores ranging from 72 to 100 percent. NCD managers and nursing experts highlighted the completeness of cohort and service history information, as well as the functionality of map navigation buttons. Community physicians underscored the significance of interactive service features. Web managers identified the integration of photo sensors, enhancements in visual design, and repositioning the back button as key improvements. Language and contextual experts recommended adapting the features to local contexts to increase relevance and user accessibility. The feature is considered ready for implementation, with suggestions to refine content, interface, and interactivity to optimize effectiveness and readability for users.

Table 4. Overall Expert Feasibility Summary of the Android-Based PTM Application

Feature	Total Items (All Experts)	Total Score	Max Score	Overall Mean Score	Overall Feasibility (%)	Feasibility Category
PTM Screening	25	113	125	4.52	90.4	Highly feasible
PTM Education	25	101	125	4.04	80.8	Feasible
Homecare Service	25	110	125	4.40	88.0	Highly feasible
Overall Application	75	324	375	4.32	86.4	Highly feasible

Expert evaluation of the Android-based PTM application found it highly feasible overall, with an average score of 4.32 (86.4%). Specifically, the PTM screening and home care features were rated highly feasible with scores of 4.52 (90.4%) and 4.40 (88.0%), respectively, while the PTM education feature scored 4.04 (80.8%), indicating adequate feasibility. These results support the conclusion that overall, the Android-based PTM application meets high feasibility standards and is ready for implementation. However, some minor improvements to the education features and interface could further enhance its effectiveness and readability for users.

To ensure the instrument used in this study accurately assessed the overall application of PTM, a construct validity test was conducted. This test aimed to determine the suitability of each instrument item to the construct being measured. The complete construct validity results are presented in Table 5.

Table 5. Results of construct validity test

component	rxy	r table	significance	explanation
Ease of Use				
Easy-to-use app	0.366	0.312	0.020	valid
Easy-to-learn app	0.523	0.312	0.001	valid
Consistent navigation	0.595	0.312	0.000	valid
All functions accessible	0.766	0.312	0.000	valid
Easy to return to the home menu	0.649	0.312	0.000	valid
Interface and Satisfaction				
Attractive app display	0.600	0.312	0.000	valid
Easy to find information	0.477	0.312	0.002	valid
Displays action progress	0.619	0.312	0.000	valid
Privacy remains secure	0.566	0.312	0.000	valid
Appropriate usage time	0.644	0.312	0.000	valid
Intention to reuse	0.597	0.312	0.000	valid
Attractive app	0.736	0.312	0.000	valid
Usefulness				
Beneficial for health	0.558	0.312	0.000	valid
Learn about home care services	0.638	0.312	0.000	valid
Helps prevent the risk of disease	0.640	0.312	0.000	valid
All features are complete according to your needs	0.521	0.312	0.001	valid
Stable even on weak connections	0.684	0.312	0.000	valid

rxy: calculated value of validation results.

The construct validity analysis showed that all 17 instrument items met the validity criteria, with Pearson correlation coefficients (rxy) ranging from 0.366 to 0.766, all exceeding the r-table value of 0.312 and reaching statistical significance ($p < 0.05$). This indicates that each item shows a significant positive correlation with the total score and adequately contributes to its respective construct. Across the three dimensions: Ease of Use, Interface, Satisfaction, and Usefulness. The items demonstrated satisfactory preliminary construct validity, suggesting that the instrument can measure aspects of the Android application's usability and quality development phase. After construct validity is established, the results of the reliability test assessing the instrument's internal consistency are presented in Table 6.

Table 6. Reliability Test Results

component	α	explanation
Ease of Use		
Easy-to-use app	0.878	reliable
Easy-to-learn app	0.873	reliable
Consistent navigation	0.881	reliable
All functions accessible	0.863	reliable
Easy to return to the home menu	0.871	reliable

component	α	explanation
Interface and Satisfaction		
Attractive app display	0.870	reliable
Easy to find information	0.875	reliable
Displays action progress	0.870	reliable
Privacy remains secure	0.872	reliable
Appropriate usage time	0.869	reliable
Intention to reuse	0.871	reliable
Attractive app	0.866	reliable
Usefulness		
Beneficial for health	0.872	reliable
Learn about home care services	0.869	reliable
Helps prevent the risk of disease	0.869	reliable
All features are complete according to your needs	0.873	reliable
Stable even on weak connections	0.867	reliable

α: Cronbach's Alpha.

The reliability analysis showed that all items across the Ease of Use, Interface and Satisfaction, and Usefulness dimensions demonstrated satisfactory internal consistency, with Cronbach's alpha values ranging from 0.863 to 0.881. Furthermore, the overall 17-item instrument yielded a total Cronbach's alpha of 0.878, indicating good internal consistency reliability. These findings suggest that the instrument items consistently measure the intended constructs and are sufficiently reliable for preliminary evaluation of the Android-based NCD application during the development phase.

DISCUSSION

This research makes a significant contribution to the development of Android-based digital health applications that support promotive and preventive efforts, particularly by reducing the risk of non-communicable diseases (NCDs) and disseminating information on home care services. In contemporary healthcare, the success of digital innovation depends not only on feature availability but also on user acceptance, which is shaped by perceived ease of use, interface quality, satisfaction, and usefulness. This perspective is consistent with technology acceptance frameworks such as the Technology Acceptance Model (TAM), which identifies perceived ease of use and perceived usefulness as primary determinants of reuse intentions and sustained engagement with health technology (30,31). Accordingly, the evaluation approach adopted in this study is justified, as it assesses the application as an integrated and functional system rather than focusing on isolated features.

The expert evaluation results demonstrate that the application meets the eligibility criteria and provide substantial recommendations to enhance its quality prior to user deployment. Expert involvement at the evaluation stage ensures content relevance, accurate health terminology, a precise user flow, and an interface that meets user needs. These findings underscore that expert validation is a critical phase in the development of digital health technologies, as it enables early identification of conceptual and design issues, thereby reducing bias and implementation errors during user testing. Previous studies have established that expert review is essential for ensuring content quality and improving usability readiness, particularly in healthcare contexts that require accurate information and user security (32).

Expert feedback on each application feature provided detailed insights into usability and content context, identifying areas requiring improvement to enhance responsiveness to user needs. Recommendations regarding NCD screening features, such as service history and the inclusion of physical activity restrictions, highlight the necessity for more comprehensive clinical information. This observation is consistent with previous research indicating that health applications that provide users with clinical data on their health history tend to increase engagement and improve the accuracy of health

risk monitoring (33,34). For the NCD education feature, suggestions to incorporate local risk factors, educational videos, and emphasize information on the critical period for stroke support a multimedia-based educational approach. Prior studies have demonstrated that integrating video and illustration elements in health applications enhances user understanding and information retention (35). Additionally, recommendations for home care services, including improvements in interactivity, clarity of map navigation buttons, photo sensors, and font size, underscore the importance of strengthening the interface and accessibility. Research by Schnall et al. supports the finding that user experience in digital health applications is highly dependent on interface responsiveness and ease of navigation (36). Contextual recommendations for local language and content adjustments align with evidence that localizing digital health content by adapting language, culture, and resource availability is vital for increasing user engagement and facilitating accurate interpretation of health information (37). Collectively, this expert input advances both the technical and design aspects of the application, promoting user-centered and contextually relevant solutions that enhance acceptance and functional effectiveness. However, these expert evaluation findings should be interpreted with caution, as the assessment was based on a purposively selected panel of five multidisciplinary experts, which may introduce subjective judgment bias and variability in perspectives. Although expert review is a key component of formative evaluation in health technology development, methodological studies indicate that such assessments may be influenced by professional background, contextual expectations, and individual judgment tendencies (17).

The construct validity test results indicated that all 17 statement items were valid, with Pearson correlation values (rxy) ranging from 0.366 to 0.766, all exceeding the r-table value of 0.312, and p-values between 0.000 and 0.020 ($p < 0.05$). These results demonstrate that each item correlates adequately with the total score and conceptually represents the construct being measured. Construct validity is a critical aspect of evaluating digital health applications, as it ensures the instrument accurately measures dimensions of user experience, including ease of use, interface satisfaction, and the application's usefulness in supporting health behaviors. This approach is consistent with usability literature, which emphasizes that construct validity measurement underpins the scientific assessment and replicability of technology acceptance instruments (17,38). Accordingly, the instrument in this study meets robust construct evaluation standards for assessing the overall quality of health applications. However, these construct validity findings should be considered preliminary, as the validation procedure was limited to Pearson item-total correlations during the small-scale development phase. Advanced psychometric methods, such as Exploratory Factor Analysis (EFA) and Confirmatory Factor Analysis (CFA), were not conducted due to the limited sample size ($n = 40$), which falls below recommended thresholds for stable factor analysis. Previous psychometric research suggests that EFA typically requires at least 100 participants or a participant-to-item ratio of 5:1 to ensure factor stability and replicability (39). Therefore, these findings should be regarded as initial construct validity evidence within the research and development phase, warranting further large-scale validation in future studies.

The reliability test showed excellent results, with Cronbach's alpha (α) values ranging from 0.863 to 0.88. The reliability test produced strong results, with Cronbach's alpha (α) values ranging from 0.863 to 0.881, consistently surpassing the acceptable reliability threshold ($\alpha > 0.60$). These values indicate high internal consistency, demonstrating that the instrument's items reliably measure the same construct. High reliability is essential in application development research, as unreliable instruments produce inconsistent data, complicating decisions regarding application quality (40,41). In usability evaluation, a high Cronbach's alpha signifies that the instrument consistently measures user perceptions and is suitable for further large-scale assessment (42,43). The reliability findings in this study confirm that the application assessment instrument possesses adequate psychometric quality. However, these results should be interpreted within the context of a small-scale, preliminary user trial. In early-stage

instrument development, reliability evidence from small samples is valuable for formative evaluation and item refinement, but larger samples are necessary to establish more robust psychometric stability across diverse populations. Research on mHealth usability instruments similarly recommends subsequent validation at larger scales to confirm internal consistency across different user groups (17). The application is well-prepared for use as a digital-based health management support medium. This finding is important because various studies have shown that the failure of health application implementation is often not due to a lack of technology but rather to poor usability, inconsistent alignment with user needs, and a weak systematic evaluation process (44). With strong evidence of validity and reliability, this application has the potential to increase user acceptance, enhance user satisfaction, and encourage continued use in the context of promotive and preventive services. Despite these promising findings, several limitations should be acknowledged. The small-scale user trial involved only 40 respondents, which may limit the generalizability and robustness of the psychometric findings. In addition, the validation process was limited to preliminary construct validity and internal consistency testing, without advanced psychometric methods such as EFA or CFA. Furthermore, the expert evaluation may be subject to potential subjective bias due to the purposive selection of a limited expert panel. Further research is recommended to continue testing on a larger scale to evaluate the application's effectiveness in changing health behaviors, monitoring compliance, and reducing the long-term risk of NCDs.

CONCLUSION

This study shows that the Android-based NCD application is feasible based on the results of expert feasibility evaluations on all features, namely NCD screening, NCD education, and home care services, with the overall feasibility of the application being in the highly feasible category. In addition, the results of the construct validity test prove that all evaluation instrument items are declared valid (rxy > r-table; $p < 0.05$), while the reliability test shows perfect internal consistency (Cronbach's alpha 0.863–0.881; $\alpha > 0.60$). Therefore, this application is considered to have adequate content quality, functionality, and usability, and is supported by valid and reliable evaluation instruments, suggesting it has the potential to serve as a digital medium for the prevention and management of NCDs in the community.

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AUTHOR'S CONTRIBUTION STATEMENT

A.A.P: product development, data collection, conceptualisation, data analysis, writing, and finalisation of the manuscript. R.E.R: product development and conceptualisation. W.Y., S.S., F.R., and E.Y: product development and data collection.

CONFLICT OF INTEREST

The authors declare no conflict of interest.

DECLARATION OF GENERATIVE AI AND AI-ASSISTED TECHNOLOGIES IN THE WRITING PROCESS

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