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Analysis of Usability and Satisfaction of Family Assistance Teams at Risk of Stunting on the Use of Stunting Prevention Education Media Packages (PasTi PenTing)

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ABSTRACT

Stunting remains a major public health concern because of its adverse effects on child growth, development, and health. Family Assistance Teams support families at risk of stunting through education and mentoring. However, educational materials for different target groups are often provided separately. PaSti PenTing was developed to integrate technology-based educational content and local wisdom into a comprehensive package addressing nutrition-specific and nutrition-sensitive interventions for stunting prevention. This study aimed to assess the usability of PaSti PenTing and explore user satisfaction among Family Assistance Team members in Jagasatru, Cirebon City, Indonesia. This research and development (R&D) study evaluated the educational package using the Post-Study System Usability Questionnaire (PSSUQ) and a focus group discussion (FGD). Eight participants were involved, including four midwives and four cadres. The mean PSSUQ scores were 1.37 for System Usefulness (SysUse), 1.25 for Information Quality (InfoQual), 1.60 for Interface Quality (IntQual), and 1.58 for overall satisfaction. As lower PSSUQ scores indicate more favorable evaluations, these findings suggest positive perceptions of usability among the participants. Thematic analysis of the FGD data identified four themes: perceived efficiency compared with conventional educational materials, the need to improve role-based navigation, dependence on internet connectivity, and overall satisfaction accompanied by a need for additional materials to support group education. Overall, PaSti PenTing demonstrated promising preliminary usability and was positively received by the participating midwives and cadres.

INTRODUCTION

Stunting causes an increase in child pain and mortality[1], which is part of double burden malnutrition, has a very detrimental impact on health and economic productivity [2]. Based on Presidential Regulation of the Republic of Indonesia number 72 of 2021, the target stunting prevalence in 2024 is 14% [3]. Based on SSGI data in 2024, the prevalence of stunting in Indonesia has not reached the target of 19.8%[4]. All city districts in West Java Province are set to be priority loci for stunting reduction in 2022, including Cirebon City and Regency.[5] Accelerating stunting reduction is carried out through specific interventions (addressing direct causes) and sensitive interventions (addressing indirect causes) which must be implemented in a convergent, holistic, integrative and

quality manner through multi-sector cooperation by intensifying assistance for families at risk of stunting. The components of the Stunting Reduction Acceleration Team at the Village/Village level are the Family Assistance Team, consisting of midwives, PKK driving team cadres and family planning cadres who carry out assistance through counseling to prospective brides, pregnant women, breastfeeding mothers and children 0-59 months. Midwives occupy a central role as a professional partner of the government and an extension of the state in carrying out stunting prevention.[2] The collaboration of midwives and cadres can be a catalyst for accelerating stunting reduction. Interprofessional collaboration with other health workers, especially nutritionists, is very necessary.

To provide assistance, it is necessary to have educational media that is accurate, interesting and easy to understand. Digital education has been used to support maternal and child nutrition, including education about undernutrition and complementary feeding. Recent Indonesian studies have evaluated mobile applications and digital tools for stunting education and monitoring, while other interventions have examined structured nutrition education and its relationship with maternal knowledge and feeding practices 24–26 These studies indicate the potential of digital approaches, but they do not remove the need to assess whether a particular tool is understandable, usable, and acceptable to its intended users. Existing media and applications often address selected topics or user groups. The practical question that remains is whether an integrated package combining education for different stages of the family life course, nutrition-specific and nutrition-sensitive content, and locally relevant examples can be used effectively by the Family Assistance Team during routine mentoring. Edu Anemia App Can Improve Knowledge and Compliance of Adolescents Taking Fe Tablets [6]. Education using videos to increase pregnant women's knowledge about Fe tablet consumption [7]. The Mama ASIX application is more effective in increasing pregnant women's knowledge and attitudes about Exclusive Breastfeeding[8]. The use of rebon shrimp powder as a local food in Cirebon, which is a source of high animal protein and calcium at a low price can be an option in making additional food for toddlers[9] [10]. Education using video can improve MP-ASI giving practices based on local wisdom [11]. Android-based is effective on parents' knowledge of basic immunizations[12]. Educational methods can increase the knowledge and skills of cadres in monitoring the growth and development of toddlers[13]. The ABPK application with family planning has been proven to make it easier for midwives to conduct family planning counseling as well as increase client knowledge and contraceptive use [14] Based on these various studies, the existing educational media are still separate, not yet merged into one comprehensive media for specific and sensitive interventions. Based on a preliminary study on the family assistance team in Cirebon, in providing assistance, there is material that has not been delivered to each target group, so comprehensive educational media is needed so that it is more interesting and easy to use. In 2024, the design of a Stunting Prevention Education

Media Package (PaSti PenTing) based on technology and local wisdom as well as internal validation from material and media experts has been carried out with very decent results[15]. The present study addresses this gap by evaluating the usability and user satisfaction of PaSti PenTing among the midwives and cadres who provide family assistance in Jagasatru, Cirebon City. The package builds on the previously reported design and expert validation of PaSti PenTing.15 Its practical novelty is the integration of technology-based educational materials with local-wisdom content across several family life stages in one package intended to support frontline mentoring. Unlike studies that assess changes in knowledge or child outcomes, this study focuses specifically on usability and user experience. It therefore contributes preliminary evidence about the acceptability and practical use of an integrated educational package, rather than evidence of intervention effectiveness. The purpose of this study is to conduct a usability analysis and analyze the satisfaction of PasTi PenTing users (family assistance team at risk of stunting).

MATERIALS AND METHODS

This study used a Research and Development (R&D) approach and reports the usability-evaluation stage of the technology-based Stunting Prevention Education Media Package (PaSti PenTing). The package contains educational videos and explanatory materials for families at risk of stunting and incorporates nutrition-specific and nutrition-sensitive topics with locally relevant content. The earlier design and internal validation of the package have been reported elsewhere. The present study evaluated users' perceived usability through the Post-Study System Usability Questionnaire (PSSUQ) and explored their experiences and satisfaction through an FGD. The study was conducted at the Jagasatru Health Center service area, Cirebon City. The population comprised Family Assistance Team members in Cirebon City. Eight participants were selected purposively: four midwives and four cadres. The Jagasatru service area was selected because it was identified by the research team as an area with a high stunting burden.

The research instrument used a usability questionnaire and FGD guide to determine user satisfaction. FGD procedures and qualitative analysis: The qualitative data were collected through a Focus Group Discussion (FGD), not individual in-depth interviews. The FGD explored perceived information accuracy, ease of use, completeness of features, application speed, and overall satisfaction. The transcripts were analyzed thematically through coding, categorization, and development of themes. For usability questionnaire using PSSUQ: SysUse (items 1–6), InfoQual (items 7–12), IntQual (items 13–15), and Overall (items 1–16).

RESULTS

The usability analysis of PasTi PenTing used *the Post Study System Usability Questionnaire* (PSSUQ) method.

The Post-Study System Usability Questionnaire (PSSUQ) is a standardized questionnaire used to assess perceived system usability and user satisfaction. The version applied in this study was reported as containing 16 items and four reported scores: System Usefulness (SysUse), Information Quality (InfoQual), Interface Quality (IntQual), and Overall Satisfaction. The domain means for the eight participants are presented in Table 1. Lower scores indicate more favorable responses; interpretation against benchmark values should be considered alongside the scoring version and benchmark source.

Table 1. Comparison Between PSSUQ Scales with Respondents' Answers

Scale	Scale Assessment Rules	Lower Limit	Red	Upper limit	Average Respondent Data
SysUse	Average questions 1-6	2,57	2,8	3,6	1,37
InfoQual	Average questions 7-12	2,79	3,02	3,24	1,25
IntQual	Average questions 13-15	2,28	2,49	2,71	1,60
Overall	Average questions 1-16	2,62	2,82	3,02	1,58

Based on the table above, the following results were obtained:

1) For SysUse, the mean score was 1.37. This value is lower than the reference values shown in Table 1 and, given the PSSUQ scoring direction, indicates favorable perceived system usefulness among the participants.
2) For InfoQual, the mean score was 1.25. This value indicates favorable participant ratings of the information quality, subject to confirmation of the benchmark source and scoring version.
3) For IntQual, the mean score was 1.60. The result suggests favorable perceptions of the interface quality, although the qualitative findings also identify navigation improvements that users would welcome.
4) For the overall PSSUQ score, the mean was 1.58. This indicates favorable overall perceived usability in the evaluated sample; it should not be interpreted as evidence of effectiveness or readiness for implementation at other sites.

Measurement of system quality, information quality and user satisfaction through FGD

The Focus Group Discussion (FGD) was held to evaluate the acceptance and user experience of a health education media application aimed at families at risk of stunting, with a range of features ranging from brides-to-be (catin), adolescents, pregnant women, postpartum mothers, babies, to toddlers. The discussion was facilitated by the moderator with representatives of the research team and attended by informants, namely midwives and cadres. The discussion process targets five dimensions of evaluation, namely the accuracy of information, ease of use, completeness of features, speed of application, and general user satisfaction. FGD transcripts were analyzed using a thematic analysis approach through three stages , namely coding, categorization, and theme. Through this process, four main themes were identified which are described as follows:

Theme 1: Applications are Perceived as a More Efficient Substitute for Manual Educational Media

The first theme that consistently emerged from the informant's statement was the tendency to compare applications with media and manual ways of working that have been used in mentoring practices, such as flip sheets, Maternal and Child Health Books (KIA), manual body mass index (BMI) calculators, and paper-based Pre-Screening Developmental Questionnaire (KPSP) sheets. Midwives who became informants said that the application facilitates the educational process because they no longer need to bring printed devices to the field.

> *"... It makes it easier to educate the community, pregnant women, catin, teenagers. So we no longer need to carry the return sheet that we used to use."* (Informant 1)

A similar impression was also conveyed regarding the completeness of the application content, which is considered equivalent to the official reference source that has been the handle of health workers and cadres.

> *"The information from this application is enough because all the information is exactly as on the flip sheet. Instead of us opening the KIA book."* (Informant 2)

In addition to the completeness aspect, the application is also perceived to be able to simplify instruments that were previously felt to be complicated, especially in the development screening process using KPSP.

> *"It's quite clear and simple. If the CPU needs to re-evaluate... If it's simpler here, it's already in 1 summary like a checklist book."* (Informant 3)

From the perspective of cadres, the presence of the application is felt to ease the workload that was previously quite complicated when done manually.

> *"It's nice to help. What's more, cadres are complicated by this very helpful."* (Informant 4)

The statement pattern in this theme shows that the informant's acceptance of the application does not stand alone, but is formed through an active comparison process with previous manual work experience. The perceived efficiency includes two dimensions at once, namely time efficiency and simplification of administrative burdens, both of which are important considerations in the adoption of digital health technology at the primary service level.

Theme 2: The Need for User Role-Based Interface Optimization

Although the content of the application was considered good by the majority of informants, there was also a usability issue that came up repeatedly in the discussion, namely the need to press or tap the screen several times to switch between cadre mode and family/patient mode. One informant described this experience as an additional interaction load that reduced the efficiency of use in the field.

> *"... It takes effort in tapping. Once open for cadres, once open for families. So there is a menu of choices for cadres and health workers."* (Informant 1)

A second informant also described the need for a clear choice between cadre and health-team access.

> *"Most of the applications are like that, sir. So there is a choice of cadres, or health teams."* (Informant 2)

The findings on this theme indicate that the obstacles felt by informants do not lie in the substance of the educational content, but in the information architecture and the flow of application interactions. The agreement formed directly between the moderator, the development team, and the informant during the FGD, in the form of a proposed feature for selecting user roles (midwives, cadres, or families) at the beginning of the application, shows that this discussion forum also functions as a co-design mechanism between the research team and end users in the field.

Theme 3: Reliance on Digital Infrastructure as an Implementation Challenge

Beyond the design and content aspects of the application, the informants also raised structural concerns that were beyond the developers' control, namely the limited internet access in their work area. These concerns arise even though the performance of the application itself is considered quite good in terms of speed.

> *"Maybe there is no need for a quota if it has been downloaded. I'm afraid that even if the quota is full, the signal will not be there."* (Informant 3)

This concern is reinforced by the statement of another informant who explicitly stated that the smooth use of the application still depends on the availability of data quota.

> *"Immediately fast, there are no obstacles. As long as you have a quota."* (Informant 4)

These findings confirm that the acceptance of applications functionally cannot be separated from the readiness of digital infrastructure at the field level. Even if the design and content aspects have been adequately assessed by users, connectivity factors remain a structural prerequisite that determines the success of the application implementation as a whole, especially in areas with limited signal coverage.

Theme 4: High Satisfaction with the Application as a Targeted Stunting Prevention Educational Media

In general, all informants expressed satisfaction with the application, accompanied by a collective consensus on the accuracy of the information contained in it. This consensus arises spontaneously when the moderator confirms the accuracy of the application information to all discussion participants.

"Agree...." (Informant 7)

This satisfaction is also reflected in the statement that emphasizes the benefits of applications in providing a clear direction for the educational process, compared to conditions without applications that are perceived to be less directed.

"It is very useful and systematic... If this is not there, it may not be educational." (Informant 8)

"I am satisfied because the content helps a lot." (Informant 5)

However, this high satisfaction is still accompanied by a note about the limitations of the application's scope. One of the informants noted that the available material is still oriented towards individual/family assistance, so it is not fully adequate for the needs of large group counseling.

"Maybe that's enough, sir. Except for counseling to the community such as groups of pregnant women, postpartum mothers, there may be a lack of material. But this is education, education to mentoring, so it is enough." (Informant 6)

The findings of this theme show that user satisfaction is not singular, but rather accompanied by a reflective awareness of the scope limits and goals of the application. This is important to note as input for further development, especially if the application wants to expand its use for larger-scale group counseling activities.

DISCUSSION

This study evaluated the usability and user satisfaction of PaSti PenTing among eight Family Assistance Team members in the Jagasatru Health Center service area, Cirebon City. The quantitative PSSUQ results (SysUse 1.37; InfoQual 1.25; IntQual 1.60; Overall 1.58) indicate favorable perceived usability under the PSSUQ scoring direction, while the FGD generated four themes that add context to these scores. The quantitative and qualitative findings provide methodological triangulation; because the data were obtained from the same small study setting and may involve overlapping participants, they should not be described as independent population-level evidence. The findings are discussed below in relation to the existing literature.

From a nutrition perspective, the value of an educational package such as PaSti PenTing depends on whether it can help frontline workers communicate recommendations across the continuum of maternal and child nutrition. Content on maternal nutrition, breastfeeding, complementary feeding, dietary diversity, and child growth monitoring can support nutrition-specific actions, while education on household food practices and other contextual determinants can reinforce nutrition-sensitive actions. The present study did not measure whether use of PaSti PenTing changed these practices. It only provides information about whether participating midwives and cadres perceived the package as usable and satisfactory. This distinction is important: usability is a prerequisite for routine use, but it is not a substitute for evaluating educational or nutritional outcomes.

Usability Performance Compared to Similar Digital Medical Devices

The mean PSSUQ scores for PaSti PenTing were 1.37 for SysUse, 1.25 for InfoQual, 1.60 for IntQual, and 1.58 for Overall. These results indicate favorable perceived usability in the present sample when interpreted according to the PSSUQ scoring direction, in which lower scores represent more favorable responses. However, the present study was not designed as a head-to-head comparison with other applications. Therefore, the results should not be described as demonstrating superior usability. Other researchers who have produced a comprehensive android-based application to monitor children's growth and development were carried out in Yogyakarta[16]. Comparisons with other studies are contextual only because differences in instruments, versions, populations, settings, and procedures may affect scores. PSSUQ is not specific to mobile health; the MAUQ was developed and validated for mHealth applications and may be considered in a subsequent evaluation[17]

Digital Media as a Perception Substitute for Manual Educational Tools

The first theme obtained from the focus group discussion was that PaSti PenTing was consistently compared by informants with flip sheets, Maternal and Child Health Books, manual BMI calculators, and paper-based KPSP sheets, reflecting a broader pattern that was also documented in

community mHealth research in Indonesia. In a three-year hybrid action study that resulted in the Posyandu mobile application, cadres described their paper notebooks as something that "could be used immediately", but in the end they accepted the digital alternative after being proven to be able to maintain the functionality of the paper-based Posyandu Information System while eliminating repetitive duplication of data entry.[18] A similar logic of substitution is also evident in the study's findings: informants do not describe PaSti PenTing as a completely foreign new burden, but rather as a lighter and faster equivalent to the tools they are already obliged to carry and use. This "equivalent but more efficient" framing is in line with research on the usability of culturally tailored nutrition education applications for Indonesian users, where the perception of usability is closely related to the extent to which the digital tool replicates the content that the user already trusts in a more practical form, rather than replacing it with completely foreign material.[19] Thus, the acceptance of digital health education tools among community support workers in Indonesia seems to be determined more by credible sustainability with instruments they already trust, rather than by technological novelty alone.

Role-Based Interface Friction as a Repetitive but Solvable Design Problem

The second theme is that there is input to reduce repetitive taps when moving between the cadre view and the family/patient view. The emergence of the same structural demand, different access points based on roles for supervisors, cadres, and end-users independently on two different mHealth evaluations of the Indonesian community indicates that this is not a fortuitous lack of usability, but rather a generic need for each digital tool designed to serve multiple user roles at once in the same maternal and child health workflow. This interpretation is reinforced by user-centered design (UCD) research on the mHealth supervision tool for health cadres in Sierra Leone, where the iterative involvement of field workers as well as their supervisors in group discussions and usability testing proved necessary to resolve similar friction between roles before the tool could be considered feasible to scale.[20] Last but not least, the fact that the research team and informants succeeded in formulating a concrete solution in the form of a role selection screen when the application was first opened so that in the FGD it shows that this forum functions more than just a passive evaluation event.

Infrastructure Dependence as an External Obstacle to Tools That Are Actually Well Designed

The third theme underscores a limitation in the implementation of mHealth in low- and middle-income countries (LMICs): even if an application has excellent usability, its performance in the field still depends on connectivity that is beyond the control of its designers. The informant's concern is that data quota and signal strength, not the design of the application itself, will ultimately determine performance in the field. This is in line with findings on the mHealth program for health cadres in sub-Saharan Africa. In Kampala, Uganda, infrastructure constraints, including unstable connectivity and mobile data costs, were identified as major institutional barriers to the usability, acceptability, and

sustainability of mHealth tools for community health workers.[21] In rural Malawi, health cadres using the YendaNafe app also identified the availability and adequacy of network connectivity as important sociotechnical factors shaping the sustainability of use, although their attitudes towards the tool itself were generally positive. [22] Given that the informants in this study explicitly proposed a similar solution, content that can still be used "after downloading", regardless of the availability of signals afterwards, an offline-first architecture, rather than just a gradual improvement of online performance, should be treated as a priority specification in the next PaSti PenTing development cycle, especially if this application is to be expanded beyond the UPT Jagasatru Health Center to areas with coverage equivalent or weaker tissue.

Satisfaction, Scope, and Policy Relevance of a Limited Digital Intervention

The fourth theme indicates that high satisfaction with PaSti PenTing is accompanied by reflective assessments, rather than uncritical reception, from informants, although the app is rated adequate for individual family assistance, one informant notes that the app provides relatively little material for larger-scale community counseling sessions, and the development team confirms that the app is indeed designed specifically for at-risk families stunting, not for the general public. This limited scope design is in line with the latest evidence in Indonesia that comprehensive, specifically designed stunting applications are viewed positively by health stakeholders when their scope is clearly defined and validated iteratively. A Delphi study and pilot of a comprehensive "Stunting Super App" app also found a strong consensus among healthcare professionals after the app's target population and functional limits were explicitly described.[23] Recent Indonesian studies of digital stunting tools and nutrition education provide relevant context for future outcome evaluation [24-26]. In the framework of a convergent and multisectoral strategy to accelerate Indonesia's stunting reduction, where the Family Assistance Team consisting of midwives and cadres is the implementing mechanism at the frontline, these findings indicate that PaSti PenTing has functioned as it should and that informant requests for additional group counseling materials should be treated as an opportunity to develop complementary modules, not as evidence of design weaknesses in the current tool Focus on individual/family mentoring.

Methodological Reflections and Limitations

The findings should be interpreted in light of several methodological limitations. First, the study involved a small purposively selected sample of eight participants from one primary health-center service area, which limits transferability to other settings. Participant selection may have introduced selection bias. Second, the FGD included members of the research/development context; this may have influenced responses and increased the possibility of social-desirability bias. Third, the study

relied on self-reported perceptions and did not include objective task-completion time, error rates, or other direct performance measures. The duration and intensity of participants' exposure to the application should also be considered when interpreting their responses. Fourth, there was no comparison group, and the study did not assess changes in knowledge, feeding practices, service delivery, or child growth outcomes. Fifth, the manuscript requires fuller reporting of the qualitative coding process, including the number of coders and whether intercoder comparison was undertaken. These limitations mean that the findings provide preliminary evidence of perceived usability and satisfaction, not evidence of effectiveness or readiness for broad implementation. A multisite-controlled study assessing whether PaSti PenTing impacts measurable improvements in caregiver knowledge, consistency of service delivery, or ultimately child growth outcomes, is a necessary follow-up step before wider adoption can be recommended.

CONCLUSION

PaSti PenTing demonstrated favorable preliminary perceived usability among the eight participating Family Assistance Team members in the Jagasatru Health Center service area, Cirebon City. The mean PSSUQ scores were 1.37 for SysUse, 1.25 for InfoQual, 1.60 for IntQual, and 1.58 for Overall. FGD findings indicated perceived efficiency compared with manual media and overall satisfaction, while also identifying the need to simplify role-based navigation, improve access when internet connectivity is limited, and consider supplementary materials for group education. These results represent preliminary evidence from a small, single-site evaluation and do not establish effects on knowledge, behavior, nutrition practices, or child growth. Future development should consider role-based access and offline functionality, followed by a larger multisite evaluation using objective usability measures and an mHealth-specific instrument.

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