



Beyond The Screen: Academic Benefits, Student Satisfaction, And The Quality Of Midwife-Patient Interaction After Digital Continuity Of Care (CoC) Learning

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Abstract:

Background: Continuity of Care (CoC) is a cornerstone of quality midwifery services and a key strategy for reducing maternal and infant mortality. Integrating mobile Health (mHealth) technology into CoC-based midwifery curricula is intended to strengthen holistic patient monitoring while preserving humanistic, patient-centered communication.

Aim: This study evaluated midwifery students' perceived academic benefit and satisfaction after digital CoC learning, and examined the associated quality of midwife-patient interaction and patient satisfaction.

Methods: An observational analytic study with a quasi-experimental post-test design was conducted among 51 midwifery students of Poltekkes Kemenkes Tasikmalaya (Cirebon campus) and 51 patients receiving continuity care through the D Kia application across four partner hospitals in Cirebon and Indramayu. Data were collected using structured Likert-scale questionnaires and analyzed descriptively.

Results: Students reported very high perceived academic benefit (mean 4.46 ± 0.62) and interaction satisfaction (mean 4.42), while patients rated communication quality (mean 4.52) and satisfaction with CoC (mean 4.50 ± 0.63) as very high.

Conclusions: Digital CoC learning was perceived very positively by both students and patients without compromising humanistic communication.

Implication: Findings support wider integration of mHealth into midwifery curricula to prepare digitally competent, patient-centered future midwives.

Keywords: Continuity of Care; mHealth; Midwifery Education; Digital Learning; Patient Satisfaction



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INTRODUCTION

Efforts to reduce the Maternal Mortality Rate (MMR) and Infant Mortality Rate (IMR) remain a global priority under the Sustainable Development Goals (SDGs). Achieving this target depends heavily on the availability of professional midwives capable of delivering Continuity of Care (CoC), a model of sustained, relationship-based care from

pregnancy through the postnatal period. In line with the Health Transformation agenda of the Indonesian Ministry of Health, midwifery education institutions are required to adapt to advances in information technology in order to produce graduates who are competent and adaptive in the digital era.

One pressing innovation in this regard is the development of a technology-based midwifery curriculum built around mobile Health (mHealth) applications. Integrating digital technology into CoC learning is expected to help students monitor maternal and child health holistically, systematically, and in real time, while reducing the administrative burden traditionally associated with paper-based documentation. High-quality midwifery education strengthens the delivery of midwifery services and is recognized as a key factor contributing to a country's maternal and neonatal health outcomes.

This study is a continuation of an earlier project that introduced a CoC Mobile learning platform into the midwifery curriculum. In its most recent implementation, the platform was updated and rebranded as the "D Kia" application by its developer team, and formal training for 51 midwifery students of the Cirebon campus of Poltekkes Kemenkes Tasikmalaya was conducted online in May 2026. Following this training, students used the application to provide continuity care to patients across four partner hospitals in Cirebon and Indramayu.

While digital transformation is often assumed to simplify administrative tasks, its effect on students' satisfaction in building trust with patients during real clinical encounters has not been extensively mapped analytically. Few studies specifically analyze the post-implementation period of digital CoC systems from the combined perspective of midwifery students and the patients they serve. This study therefore aims to evaluate students' perceived academic benefit and satisfaction after digital CoC learning, to assess the quality of communication and patient satisfaction toward students' digitally supported care, and to examine how these two sides of the experience relate to one another.

LITERATURE REVIEW

Continuity of Care (CoC) in midwifery refers to a model of care in which a woman receives sustained services from the same midwife, or a small team of midwives, from pregnancy through labor and the postpartum period. Midwifery services play an essential role in delivering care tailored to women's needs, encompassing preconception, pregnancy, and childbirth care as well as health education (Hunter et al., 2022; Janke et al., 2024). At

its core, CoC comprises three pillars: relational continuity, in which patients build an ongoing interpersonal relationship with a consistent care provider; management continuity, in which the care plan remains coordinated even when referral to another facility is required; and informational continuity, ensured through accurate and accessible health records such as the Maternal and Child Health Handbook or, increasingly, digital CoC applications.

Women gain trust and a sense of empowerment through midwifery services grounded in a consistent, trusted relationship with their midwife (Baghini et al., 2023). Midwives are also an integral part of the health system, facilitating collaboration among health professionals to provide counseling and continuity of care throughout the antenatal, intranatal, and postnatal periods (Asadzadeh et al., 2020; Aune et al., 2021; Vermeulen et al., 2023). Because midwifery service quality must continually be strengthened to prepare graduates for twenty-first century practice, competency-based CoC curriculum development has become essential (Muraraneza & Mtshali, 2021). Such curricula must also meet educational standards that prepare graduates for professional practice aimed at improving the quality of maternity services (Carter et al., 2020), which explains why midwifery education worldwide continues to evolve in response to its significant influence on students' preparedness to deliver continuous, woman-centered care (Johnston et al., 2022; Utami & Putri, 2021).

In the digital era, CoC is increasingly supported by mHealth systems or mobile applications, such as the D Kia application examined in this study. Digitalization in this context is intended to simplify synchronized documentation between students and midwives, provide automated reminders for patient visit schedules, and enable real-time monitoring of clinical data, functions similarly reported in other community-based mHealth monitoring initiatives in Indonesia (Rinawan et al., 2021; Susanti et al., 2022). At the same time, several studies caution that clinical documentation, whether paper-based or digital, can become a perceived burden if not well integrated into workflow (Cooper et al., 2021), and that nursing and midwifery students' experiences of digital systems during placement vary depending on how well the technology is embedded into supervised practice (Peacock et al., 2022).

The underlying philosophy of CoC is that it is not merely about "completing a medical task," but about ensuring that a woman receives holistic, humane, and high-quality companionship throughout her journey to motherhood. This philosophy frames the central question addressed in this study: whether the introduction of a digital CoC platform can

deliver genuine academic and clinical benefit without eroding the humanistic, relationship-centered essence of midwifery care.

METHOD

This study used an observational analytic design with a quasi-experimental, post-test-only approach. The independent variables were students' perceived academic benefit and satisfaction with digital CoC learning; the dependent variable was the quality of midwife-patient interaction, together with patients' satisfaction with the continuity care received.

The study was conducted at the Cirebon campus of Poltekkes Kemenkes Tasikmalaya and at four partner clinical practice sites, namely RSUD Gunung Jati, RS 45 Kuningan, RSUD Waled, and RSUD Indramayu, between January and December 2026. The population comprised midwifery students of Poltekkes Kemenkes Tasikmalaya; the sample consisted of 51 students who took part in the socialization and training for digital CoC learning, together with 51 patients who received continuity midwifery care from these students using the D Kia application.

Data collection began with a preparatory phase (January-May 2026), during which the research instruments were developed and validated, ethical clearance was obtained given that both patients and students were involved as subjects, and administrative permits were secured from the four partner hospitals. Application training for the 51 sampled students was held online via Zoom on 13 May 2026, facilitated by the developer team from Universitas Padjadjaran (UNPAD). Data collection took place from 14 to 30 May 2026 at the respective practice sites, using structured questionnaires distributed through Google Forms and completed independently by student respondents and, with student guidance, by patient respondents, following informed consent. Researchers also conducted field observation of the quality of midwife-patient interaction during care delivery, alongside monitoring visits to each hospital. An evaluation session with student respondents was held on 13 June 2026 to identify challenges encountered during data collection.

The student questionnaire consisted of ten sociodemographic and technology-use items followed by a twenty-item, five-point Likert-scale (Strongly Agree to Strongly Disagree) instrument divided into two domains: perceived academic benefit of digital transition (10 items) and satisfaction with midwife-patient interaction quality (10 items). A parallel questionnaire was administered to patients, covering digital-therapeutic communication quality and satisfaction with continuity care received. Data were processed

through editing, coding and entry, and cleaning, before univariate analysis was performed to describe respondent characteristics and mean domain scores (mean $\pm$ SD), interpreted using a five-point interval scale in which a mean of 4.21-5.00 was categorized as "very high." Consistent with the analysis plan set out in the study protocol, associations between the independent and dependent variables are further tested using the Chi-Square test to determine statistical significance ($p < 0.05$).

DISCUSSION

Respondent Characteristics

A total of 51 midwifery students and 51 patients participated in this study. Table 1 presents the sociodemographic and technology-related characteristics of the student respondents.

Table 1. Characteristics of Student Respondents (n=51)

Characteristic	Category	n	%
Age	18 years	1	2.0
	19 years	21	41.2
	20 years	25	49.0
	21 years	4	7.8
Device Used	Android	37	72.5
	iOS	13	25.5
	Tablet	1	2.0
Daily Smartphone Use	< 2 hours	1	2.0
	3-4 hours	24	47.1
	> 5 hours	26	51.0
Prior mHealth Experience	No	24	47.1
	Yes	27	52.9
Internet Access	Good	51	100.0
Prior Documentation Method	100% Paper-based	38	74.5
	Mixed	13	25.5
Clinical Practice Site	Hospital	51	100.0
Prior CoC Case Handling	Never	31	60.8
	Yes	20	39.2

Source: Research Data

Most student respondents were 19-20 years old (49% aged 20 years, 41.2% aged 19 years), predominantly used Android devices (72.5%), and reported using a smartphone for more than five hours per day (51%). More than half (52.9%) had prior experience with mHealth applications, and all respondents (100%) reported good internet access at their practice sites. Notably, 74.5% had previously relied entirely on paper-based documentation, and 60.8% had never handled a CoC case before this study, indicating that most students entered the digital CoC learning experience without substantial prior exposure to either the technology or the care model itself.

Table 2 presents the characteristics of the patient respondents who received continuity care through the application.

Table 2. Characteristics of Patient Respondents (n=51)

Characteristic	Category	n	%
Age	< 20 years	3	5.9
	20-35 years	6	11.8
	> 35 years	42	82.4
Occupation	Employed	10	19.6
	Not Employed	41	80.4
Education	Elementary/Junior High	25	49.0
	Senior High School	23	45.1
	Higher Education	3	5.9
Number of Children	1	26	50.9
	2-4	24	47.1
	> 4	1	2.0
Type of Care Received	Pregnancy (ANC)	22	43.1
	Labor (INC)	12	23.5
	Postpartum (PNC)	17	33.3
Prior Use of Health Apps	Yes	19	37.3
	No	32	62.7
Personal Smartphone Ownership	Yes	3	5.9
	No	48	94.1

Source: Research Data

Patient respondents were predominantly older than 35 years (82.4%), not employed (80.4%), and had completed only elementary or junior secondary education (49%). Most patients (94.1%) reported not owning a personal smartphone, and 62.7% had never

previously used a health-related mobile application such as Halodoc or a digital maternal and child health record. This profile suggests that the patients served in this study represented a population with comparatively limited digital literacy and access, making the humanistic, mediated role of the midwifery student in operating the application on the patient's behalf especially important.

Perceived Academic Benefit, Satisfaction, and Interaction Quality

Students' perceived academic benefit of the digital transition was rated very high overall (mean 4.46 ± 0.62). The highest-rated item was "I feel that mHealth integration is an essential step in improving the quality of midwifery education" (mean 4.54 ± 0.58), while the lowest-rated item, "the digital transition reduces administrative burden so I can focus more on the substance of care" (mean 4.36 ± 0.69), remained within the very high category. Students' satisfaction with the quality of their interaction with patients was likewise rated very high (mean 4.42), although the item concerning whether application use in front of patients disrupted verbal interaction scored comparatively lowest (mean 4.25 ± 0.77). From the patient perspective, digital-therapeutic communication quality was rated very high (mean 4.52 ± 0.61), with patients most strongly agreeing that students gave them the opportunity to ask questions after being shown their health data, and that the language used by students when explaining the application was polite and easy to understand (both mean 4.57). Patient satisfaction with the continuity care received was also very high (mean 4.50 ± 0.63), led by the item on feeling safer during pregnancy or the postpartum period because of the mHealth application (mean 4.53 ± 0.64). Table 3 summarizes the mean scores across all four dimensions measured in this study.

Table 3. Summary of Mean Scores Across the Four Study Dimensions

Dimension	Respondent	Mean $\pm$ SD	Category
Perceived Academic Benefit (Digital Transition)	Students (n=51)	4.46 ± 0.62	Very High
Satisfaction with Midwife-Patient Interaction Quality	Students (n=51)	4.42 ± 0.63	Very High
Digital-Therapeutic Communication Quality	Patients (n=51)	4.52 ± 0.61	Very High
Patient Satisfaction with Continuity of Care	Patients (n=51)	4.50 ± 0.63	Very High

Source: Research Data

Interpretation

These findings align with prior evidence that well-designed mHealth tools can support, rather than hinder, therapeutic communication when embedded thoughtfully into supervised clinical practice (Peacock et al., 2022). Contrary to concerns that digital documentation increases workload and detracts from patient-centered attention (Cooper et al., 2021), students in this study reported that the digital transition reduced administrative burden and allowed them to focus more on the substance of care, consistent with the broader aim of freeing midwives and students to deliver more relationally continuous care (Gamble et al., 2020).

The very high satisfaction reported on both sides also supports the argument that continuity of care models, regardless of the medium through which information is recorded, strengthen women's trust and confidence in their care providers (Baghini et al., 2023; Tickle et al., 2022). Importantly, patients rated students' maintenance of eye contact and attentiveness highly (mean 4.51 ± 0.70), addressing a common concern in the digital health literature that technology use during consultation risks depersonalizing the clinical encounter (Kumar et al., 2021). This suggests that, when guided by a structured curriculum and adequate training such as that provided by the UNPAD facilitator team, midwifery students are able to integrate digital tools into practice while preserving the humanistic core of CoC.

Nonetheless, the comparatively lower score on students' concentration during verbal interaction while using the application signals an area that still requires pedagogical attention, echoing findings that nursing and midwifery students' comfort with digital systems on placement is highly dependent on training quality and workflow design (Peacock et al., 2022). At the time of this progress report, quantitative bivariate testing (Chi-Square) between students' perceived benefit and satisfaction and the quality of midwife-patient interaction, as set out in the study protocol, is being finalized. Preliminary descriptive findings nonetheless point toward a consistent, positive relationship between the two, as both variables clustered predominantly in the very high category among student and patient respondents alike, in line with the broader literature linking educational quality and continuity-based practice with stronger maternal health outcomes (Smith et al., 2023; Ige & Ngcobo, 2024).

CONCLUSION

This study demonstrates that the post-implementation of digital Continuity of Care learning through the D Kia application was received very positively by both midwifery students and patients at Poltekkes Kemenkes Tasikmalaya. Students perceived substantial academic benefit from the transition to a digital learning platform and reported high satisfaction with the quality of their interaction with patients, while patients in turn rated the communication quality and continuity of care they received as very high. Rather than replacing the humanistic essence of midwifery care, the digital platform appeared to support it, providing students with tools that strengthened clinical confidence, documentation accuracy, and patient engagement without diminishing attentiveness or verbal communication. These findings answer the research questions concerning students' perceptions and the quality of midwife-patient interaction following digital CoC learning, and indicate that a thoughtfully implemented mHealth-based curriculum can advance both the academic and relational goals of midwifery education.

IMPLICATION

For the academic world, these findings provide empirical support for integrating mHealth-based Continuity of Care learning into midwifery curricula as a means of preparing digitally competent graduates without sacrificing person-centered care skills. For midwifery education institutions such as Poltekkes Kemenkes Tasikmalaya, the results strengthen the evidence base for the ongoing digital transformation of the curriculum and reinforce the institution's position as an innovative provider of health professional education. For clinical practice and patients, the study suggests that continuity care mediated by well-designed digital tools can maintain, and in some respects enhance, patients' trust, sense of safety, and satisfaction during pregnancy, childbirth, and the postpartum period. At the national and international level, these findings contribute to the broader evidence base supporting the Sustainable Development Goals target of reducing maternal and infant mortality through the preparation of technologically adaptive, humanistic midwifery professionals.

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