

Use of Mobile Application in Mother-Newborn Care

Ms. Suman Dabas¹, Ms. Vanita Kumari², Dr. Smriti Arora³

¹Tutor, College Of Nursing, Aiiims-New Delhi

²Tutor, College Of Nursing, Aiiims-Rishikesh

³Professor Cum Principal, College Of Nursing, Aiiims-Rishikesh

Abstract

The increasing use of mobile technology in healthcare has created new opportunities to improve maternal and newborn care through accessible, interactive, and evidence-based information. The transition to parenthood can be challenging, as mothers and families require knowledge, skills, and emotional support for effective postpartum and newborn care. This review explores the use and potential of mobile applications in mother–newborn care. Existing literature indicates that mobile applications can provide breastfeeding education and support, newborn feeding and sleep monitoring, growth and developmental guidance, health and medical record management, appointment reminders, emergency information, and parental well-being support. Studies have also demonstrated that mHealth interventions can improve maternal and child health practices, continuity of care, parental confidence, and selected health outcomes. However, limitations in the functionality, credibility, usability, and comprehensiveness of existing applications highlight the need for professionally developed and evidence-based solutions. Mobile applications also offer opportunities for nursing education, clinical practice, and research by supporting health education, clinical learning, data collection, follow-up, and evaluation of maternal and newborn outcomes. Overall, a comprehensive and user-friendly mother–newborn care mobile application has the potential to complement existing healthcare services, promote informed caregiving, improve continuity of care, and strengthen maternal and newborn health outcomes.

Introduction

The rapid development of mobile computing devices, including smartphones and tablets, has transformed healthcare delivery by providing healthcare professionals with convenient access to information, communication, patient monitoring, clinical decision-making, and education at the point of care.¹ The advanced features of these devices, such as internet connectivity, cameras, audio recording, applications, and high-resolution displays, have further expanded their potential in healthcare.²

The transition to parenthood can be challenging and stressful due to new caregiving responsibilities, changes in family relationships, and the need to acquire knowledge and skills for newborn care.³⁻⁴ Parents require both **informational support**, such as advice and guidance, and **emotional support**, including reassurance and empathy.⁵ Mobile applications can provide these forms of support continuously and conveniently through educational resources, social networking, messaging, live chats, and other interactive features.⁶⁻⁷

Therefore, mobile applications have considerable potential to strengthen **mother and newborn care** by providing accessible, personalized, interactive, and evidence-based health information. A well-designed

application can support mothers in acquiring knowledge and skills related to breastfeeding, newborn care, recognition of danger signs, and appropriate healthcare-seeking, while also facilitating communication with healthcare professionals.

Review of literature

Nayak, B.S. et al. (2018)⁸ conducted a randomized controlled trial to evaluate the effectiveness of an mHealth-based preterm home-care program on developmental outcomes of preterm infants. The study included 300 preterm-mother dyads randomized into intervention and control groups. The intervention group received a mobile-based Preterm Home Care Program supported by trained community health workers using the NeoRaksha application, while the control group received standard care. The study aimed to improve continuity of care after NICU discharge and enhance developmental outcomes through technology-enabled home-based follow-up.

Banerjee, J. et al. (2019)⁹ conducted an experimental study to evaluate the effectiveness of an Integrated Family Delivered Care (IFDC) programme on infant health outcomes and parental experience. The programme included an IFDC mobile application, an education and competency-based training package, and staff training. Among 89 recruited families, 37 infants were compared with 57 gestational-age- and birth-weight-matched retrospective controls. The IFDC group had significantly shorter length of hospital stay and lower corrected gestational age at discharge. Infants born at <30 weeks also achieved full suck feeding earlier, suggesting that family-integrated, technology-supported care may improve outcomes for preterm infants.

Bailey, E. et al. (2022)¹⁰ conducted a qualitative study using Appreciative Inquiry to explore how and why first-time mothers used the *Baby Buddy* app and their perceived benefits and challenges. Semi-structured interviews were conducted with 17 mothers across three UK sites, and data were thematically analysed. Mothers valued the app for providing reliable, accessible information that increased their confidence and supported communication with healthcare professionals. However, some preferred face-to-face support for discussing specific or complex concerns and desired more detailed information on certain topics. The study concluded that accessible and reliable app-based information can enhance mothers' knowledge, confidence, and communication with healthcare professionals.

Entsieh A, Emmelin M, and Pettersson K (2015)¹¹ conducted a qualitative study to explore pregnant and nursing mothers' experiences with the *Mobile Midwife* mHealth programme. Semi-structured in-depth interviews and focus group discussions were conducted among 29 mothers aged 20–35 years. Thematic analysis identified an overarching theme of “*embracing Mobile Midwife as a trustworthy and constant source of support*,” with benefits including improved understanding of pregnancy-related advice, preparation for specialized care, and increased confidence in child care. The study concluded that mHealth interventions can serve as a valuable complementary approach to strengthening maternal health and healthcare systems.

Lee Y, and Moon M (2016)¹² conducted a cross-sectional study to explore the use, characteristics, content, and credibility of mobile applications related to pregnancy, childbirth, and childcare among pregnant women. Among the participants, 55% used such applications, with first-time mothers showing greater usage. Information on pregnancy risks and diseases was most frequently accessed, while users expressed a need for expert advice and Q&A features regarding diet and medications. Although mobile applications were an important source of information, the credibility of their information sources received

the lowest rating. The study emphasized the need for credible, professionally developed and managed pregnancy and childcare applications.

Sardi L, Redman L, Bezad R, Aleman J (2019)¹³ A systematic review was conducted to evaluate the functionalities and technical features of postnatal mobile applications available on iOS and Android platforms. Using a systematic literature review protocol, 48 postnatal apps were assessed using a 37-item questionnaire developed from the literature on postnatal care and an evaluation of existing apps. The findings showed that most apps had relatively low functional scores, reflecting the complexity and multidimensional nature of postnatal care. The study highlighted gaps in existing applications and recommended further development of comprehensive, evidence-based, and user-suitable postnatal mobile applications.

Saha, S. and Quazi, Z.S. (2022)¹⁴ conducted a mixed-method study to evaluate the effectiveness of the **TeCHO+**, a mobile and web-based application designed to support frontline health workers in delivering maternal and child health services. The study compared service coverage and data quality before and one year after implementation among postpartum women and mothers of children in Gujarat. Following implementation, significant improvements were observed in full antenatal care, iron-folic acid consumption, early initiation of breastfeeding, and selected childhood immunization indicators. Data quality also improved, while health workers reported substantial time savings in documentation. The study concluded that technology-enabled frontline health services can improve the coverage and quality of maternal and child healthcare.

Sampathkumar S. Sankar M, Ramasamy S. et al. (2022)¹⁵ A mixed-method study was conducted to assess the feasibility of a text-messaging intervention for postnatal care in India and identify barriers and facilitators to its use. Most participants reported that the messages helped them understand postpartum changes, provided continuity of care, and clarified conflicting information. Over 90% read the messages daily, and approximately 75% shared the information with others. Key barriers included technical problems, lack of perceived usefulness, limited time, and family-related decision-making. Qualitative findings highlighted the value of reliable, current, accessible, and relevant information. The study concluded that text messaging is a feasible and acceptable approach for delivering targeted postnatal health information.

Feroz, A., Perveen, S. and Aftab, W. (2017)¹⁶ conducted a systematic review to assess the role of mHealth applications in improving antenatal and postnatal care in low- and middle-income countries. Fourteen studies were included in the final analysis, with most interventions focusing on client education and behaviour-change communication through SMS and voice reminders. The review found that mHealth interventions can improve preventive maternal healthcare services, particularly by promoting positive behaviours during pregnancy and the postnatal period. However, evidence regarding other mHealth applications was limited, highlighting the need for more controlled and well-reported studies.

Coelhoso, C.C., Tobo P. et al. (2019)¹⁷ conducted a randomized controlled trial to evaluate the effectiveness of a mobile app for stress management and well-being among working women. A total of 490 eligible participants were randomized to an intervention or active control app. The intervention consisted of an 8-week programme with guided practices and educational sessions, while outcomes were assessed using the Perceived Stress Scale and WHO-5 Well-Being Index. The intervention group showed significant improvements in work-related well-being and reductions in work-related and overall stress compared with the control group. The study concluded that a structured mobile app can effectively reduce stress and improve well-being among working women.

Garner, S.L. , Young P. *et al.* (2023)¹⁸ conducted a randomized controlled trial to evaluate the effectiveness of a culturally responsive, interactive gaming mHealth application for improving diabetes health literacy among an underserved urban population in India. Participants were randomized to either an mHealth education group or a traditional verbal education group. Both groups demonstrated significant improvements in diabetes health literacy, with no significant difference between the two approaches ($P=.9306$). The study concluded that culturally tailored mHealth education can be as effective as conventional verbal education and may provide a cost-effective approach to health education in low- and middle-income settings..

Gopichandran, L. , Garg, R. *et al.* (2023)¹⁹ developed and evaluated a mobile application to improve medication adherence and symptom monitoring among cancer patients receiving palliative care. The system used cloud-based data synchronization and medication reminders, while enabling patients to record medication adherence, daily symptoms, symptom severity, and SOS medication use. Ten palliative-care physicians tested the system and successfully verified data transfer between the web-based platform and mobile application. The study concluded that the application could enhance patient–physician communication, improve symptom management and medication adherence, and potentially improve quality of life and reduce hospitalizations.

Use of mobile application in postpartum mother care

Mobile applications can support maternal and newborn care by providing prenatal education and information on fetal development, nutrition, and healthy pregnancy practices, along with reminders for antenatal check-ups, vaccinations, and other appointments. They can facilitate monitoring and tracking of infant growth, feeding, sleep, and diaper changes, and provide breastfeeding support through guidance on techniques, troubleshooting, and access to lactation consultants or support groups. Mobile applications can also offer information on postpartum recovery, exercise, mental health, and medication adherence, as well as enable telemedicine and virtual consultations with healthcare professionals. They may provide quick access to emergency resources, facilitate peer and community support, and enable remote monitoring of high-risk pregnancies. Applications can be designed with language and cultural sensitivity to improve accessibility, integrate with electronic health records for secure access to health information, and provide parenting resources related to infant care, child development, and behaviour management.

Use of mobile application in Newborn care

Mobile applications can support parents and caregivers in newborn care by providing information and tools for **feeding, sleep, growth and developmental milestones, breastfeeding, temperature and health monitoring, emergency and first-aid care, parental well-being, and health record management**. These features can promote informed caregiving, timely healthcare seeking, and continuity of newborn care.

Nursing implication of mobile application in Nursing Research: Mobile applications offer opportunities to advance nursing research in maternal and newborn care. They can support intervention studies, multicentre research, and long-term follow-up to evaluate maternal and newborn outcomes. Applications can also be developed for neonates in specialized units and used in quality-improvement initiatives to identify nursing needs and enhance continuity of care. Future research may assess the **effectiveness, usability, acceptability, cost-effectiveness, and scalability** of mobile health interventions.

Nursing implication of mobile application in clinical practice:

The application can **save nurses' time in providing health education** on postpartum and newborn care. It can **prepare pregnant women for postpartum and newborn care** through accessible, timely, and interactive education.

Conclusion

In conclusion, a mobile application for mother and newborn care has the potential to revolutionize the way maternal and infant health care is delivered. By providing accessible, personalized and reliable information and support, such an application can significantly contribute to the well-being of mothers and their newborns. However, it is imperative to approach this development with a strong commitment to privacy, user-friendliness and ongoing collaboration with healthcare professionals.

References

1. Mosa AS, Yoo I, Sheets L. A systematic review of health care apps for smartphones. *BMC Med Inform Dec Mak*. 2012 Jul;12:67. [[PMC free article](#)] [[PubMed](#)] [[Google Scholar](#)]
2. Boulos MN, Wheeler S, Tavares C, Jones R. How smartphones are changing the face of mobile and participatory health care; an overview, with example from eCAALYX. *Biomed Eng Online*. 2011 Apr;10:24. [[PMC free article](#)] [[PubMed](#)] [[Google Scholar](#)]
3. Colliver Y, Hatzigianni M, Davies B. Why can't I find quality apps for my child? A model to understand all stakeholders' perspectives on quality learning through digital play. *Early Child Dev Care* 2020;190:2612-26.
4. Richardson B, Dol J, Rutledge K, et al. Evaluation of mobile apps targeted to parents of infants in the neonatal intensive care unit: systematic app review. *JMIR Mhealth Uhealth* 2019;7:e11620
5. Virani A, Duffett-Leger L, Letourneau N. Parents' perspectives of parenting app use. *J Inform Nurs* 2020;5:8-18.
6. Wallace S, Clark M, White J. 'It's on my iPhone': attitudes to the use of mobile computing devices in medical education, a mixed-methods study. *BMJ Open*. 2012 Aug;2:e001099. [[PMC free article](#)] [[PubMed](#)] [[Google Scholar](#)]
7. Ozdalga E, Ozdalga A, Ahuja N. The smartphone in medicine: a review of current and potential use among physicians and students. *J Med Internet Res*. 2012;14(5):e128. [[PMC free article](#)] [[PubMed](#)] [[Google Scholar](#)]
8. Nayak, B.S. et al. (2018) 'Randomized controlled trial on effectiveness of mhealth (mobile/smartphone) based preterm home care program on developmental outcomes of preterms: Study protocol', *Journal of Advanced Nursing*, 75(2), pp. 452–460. doi:10.1111/jan.13879.
9. Banerjee, J. et al. (2019) 'Improving infant outcomes through implementation of a family integrated care bundle including a parent supporting mobile application', *Archives of Disease in Childhood - Fetal and Neonatal Edition*, 105(2), pp. 172–177. doi:10.1136/archdischild-2018-316435.
10. Bailey, E. et al. (2022) 'First-time mothers' understanding and use of a pregnancy and parenting mobile app (The baby buddy app): Qualitative Study using Appreciative Inquiry', *JMIR mHealth and uHealth*, 10(11). doi:10.2196/32757.
11. Entsieh, A.A., Emmelin, M. and Pettersson, K.O. (2015) 'Learning the abcs of pregnancy and newborn care through mobile technology', *Global Health Action*, 8(1), p. 29340. doi:10.3402/gha.v8.29340.

12. Lee, Y. and Moon, M. (2016) 'Utilization and content evaluation of mobile applications for pregnancy, birth, and child care', *Healthcare Informatics Research*, 22(2), p. 73. doi:10.4258/hir.2016.22.2.73.
13. Saha, S. and Quazi, Z.S. (2022) 'Does digitally enabling frontline health workers improve coverage and quality of maternal and Child Health Services? findings from a mixed methods evaluation of Techo+ in Gujarat', *Frontiers in Public Health*, 10. doi:10.3389/fpubh.2022.856561.
14. Sardi, L. et al. (2020) 'Mobile health applications for postnatal care: Review and analysis of functionalities and technical features', *Computer Methods and Programs in Biomedicine*, 184, p. 105114. doi:10.1016/j.cmpb.2019.105114.
15. Sampathkumar S. Sankar M, Ramasamy S. et al. (2022) 'Uptake, engagement and acceptance, barriers and facilitators of a text messaging intervention for postnatal care of mother and child in India—a mixed methods feasibility study', *International Journal of Environmental Research and Public Health*, 19(15), p. 8914. doi:10.3390/ijerph19158914.
16. Feroz, A., Perveen, S. and Aftab, W. (2017) 'Role of mhealth applications for improving antenatal and postnatal care in low and middle income countries: A systematic review', *BMC Health Services Research*, 17(1). doi:10.1186/s12913-017-2664-7.
17. Coelho, C.C. et al. (2019) 'A new mental health mobile app for well-being and stress reduction in working women: Randomized controlled trial', *Journal of Medical Internet Research*, 21(11). doi:10.2196/14269.
18. Garner, S.L. et al. (2023) 'Effectiveness of a culturally responsive mhealth gaming application to improve diabetes health literacy in India', *CIN: Computers, Informatics, Nursing*, Publish Ahead of Print. doi:10.1097/cin.0000000000001009.
19. Gopichandran, L. et al. (2023) 'Development of Mobile Application-based system for improving medication adherence among cancer patients receiving palliative therapy', *Indian Journal of Palliative Care*, 29, pp. 51–56. doi:10.25259/ijpc_12_2021.