CONFERENCE PAPER

Telehealth in Pregnancy: Historical Evolution and Practical Insights from Iran and Türkiye

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Abstract
This narrative review explores the history of telehealth in pregnancy, following the evolution of telehealth since initial physiological monitoring systems in the 1960s to the complex digital platforms that many have embraced during and after the COVID-19 pandemic. Although the progress has been global, there is an increased interest in Iran and Türkiye, where telehealth initiatives have evolved significantly over the past years. The literature review was performed through queries in PubMed, Google Scholar, and Scopus with the following keywords: telehealth, telemedicine, pregnancy, Iran, Türkiye, history. Telehealth in obstetrics was initially in the form of low-end consultations in the 1990s, but has evolved into high-end digital gadgets (e.g. apps, sensors) by the 2010s. Equity, privacy, and evidence-based standards should be considered in the requirements of the future integration owing to the desire of quality and accessibility.

Key words: History, Iran, Telemedicine, Türkiye, Digital Health

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Introduction

The idea of providing medical services between locations deemed to be a distance apart is not a recent innovation. The history of telehealth goes back to even before the era of the ubiquitous smartphone. During the 1960s, National Aeronautics and Space Administration (NASA) first applied remote monitoring of vital signs of astronauts, a technological basis of telemedicine. Starting with the Gemini Program, telemetry of heart rate, temperature, and other physiological parameters in real-time to watch-side controllers on Earth became possible and made medical monitoring of spaceflight possible.

Meanwhile, in the same period, ground-based projects such as the 1964 Nebraska Psychiatric Institute two-way closed-circuit television link allowed remotely located psychiatric care in rural locations to be consulted upon by urban practitioners. In 1967, the staff of Massachusetts General Hospital implemented the use of telemedicine support to assist patients at safety complexes in Boston in the city of Logan. In this regard, microwave audio/video communication was the method used in this implementation. In the early 1970s, new satellite-based telemedicine programs arose to serve remote populations, with NASA implementing the Space Technology Applied to Rural Papago Advanced Health Care (STARPAHC) project to provide care to the Papago (Tohono Oodham) reservation, along with similar projects in Alaska and throughout the United States at the federally funded research stations. In the late 1970s and early 1980s, Canada and Australia tried satellite-delivered telemedicine, and late in the 1989 Armenian earthquake, teleconsultations between the U.S. and the Soviet Union proved useful (Melton, et al., 2020, pp. 253–271; Rahmah, et al., 2025).

Nonetheless, despite the fast pace of telemedicine development in the areas of psychiatry, emergency care, and rural health practice, its usage in the framework of pregnancy is not considerable. A key reason was that maternal care is inherently more complicated and carries greater risks, as healthcare providers must simultaneously safeguard the well-being of both the mother and the fetus. This dual responsibility contributes to a more cautious and gradual adoption of telehealth in the field of obstetrics.

The most significant transformationtelehealth occured during the COVID-19 pandemic, when it was rapidly adopted by almost all healthcare systems just in order to continue the antenatal care with the lowest risks of being infected by the infectious disease (Fryer, et al., 2020). This was also the reflection of what happened in the upper-middle-income economies, and geographically large countries of Iran (17th largeststst country globally) and Türkiye (37th largest) where healthcare systems have promptly embraced the use of telehealth platforms to maintain maternal services. In Iran, the integration of virtual prenatal counseling, diabetes care, and mental health support of pregnant women has been reported as a success, especially during times of pandemic limitations (Rafiee, et al., 2024). In Türkiye, there has been a notable increase in the use of mobile health apps and video

consultations to monitor high-risk pregnancies and increase maternal satisfaction. However, issues related to digital literacy and challenges faced in rural areas pose significant limitations to their implementation and ultimate success (Aydogdu, and Aydogdu, 2013).

While telehealth offers remarkable benefits, there are also concerns about equal accessibility, digital literacy, data privacy, and long-term cost-efficiency. The purpose of this review is to summarize the state of telehealth development during pregnancy around the world, with a specific emphasis on Iran and Türkiye and the evaluation of clinical outcomes in a range of high-risk scenarios to derive a set of implications that can be used to inform future adoption.

Materials and Methods

We conducted a narrative literature review up to August 2025 in PubMed, Google Scholar, and Scopus databases. Search terms included "*telehealth*", "*telemedicine*", "*pregnancy*", "*Iran*", "*Türkiye*", and "*history*". We prioritized systematic reviews, randomized controlled trials (RCTs), meta-analyses, and observational cohort studies. Reference lists of key articles were scanned for additional relevant studies. Inclusion criteria comprised articles published in peer-reviewed journals in English, indexed in PubMed or reputable scholarly databases. We selected studies that described historical evolution, technological tools, clinical trials, and pandemic-era adaptations related to telehealth in pregnancy.

Results

A brief history of telehealth in Iran and Türkiye during pregnancy is illustrated in Table 1.

Discussion

There is strong evidence regarding the efficacy of telehealth in managing at-risk pregnancies like GDM and hypertensive disorders that have similar outcomes to in-person care. In addition, the COVID-period experiences demonstrated that telehealth is robust and able to protect continuity in prenatal care in response to crises. These findings indicate the role of telehealth as an addition, and possible alternative, to face-to-face care.

While telehealth has benefits, major gaps in digital equality still exist. Women in lower income, rural, or linguistically diverse areas are also at risk of lacking access to broadband, devices or lack appropriate digital literacy levels, which may exacerbate existing inequalities. Future wearable and AI integration have the potential to provide more and more personalized antenatal monitoring, with the possibility of predicting complications, such as preeclampsia, early (Fryer, et al., 2020; Melton, et al., 2020, pp. 253–271).

Table 1: A Brief History of Telehealth in Pregnancy (Global, Iran, and Türkiye)

Era / Region	Period	Key Developments
Early Era: Foundations & Pilot Programs	1990s -2000s	Remote obstetric consultations via phone/video; electronic transfer of ultrasound images to remote sites. Pilot studies showed feasibility and clinician acceptance but were limited by technology.
Technological Maturation	2000s -2015	Web-based prenatal education; digital tracking of maternal vitals (blood pressure, weight, fetal movement) via online portals. Emergence of smartphone apps (e.g., gestational diabetes management). Systematic reviews supported feasibility but highlighted limited evidence quality.
COVID-19 Acceleration	2020 -2022	Rapid adoption of virtual prenatal visits to minimize infection risk. Hybrid models of care (virtual + in-person). Studies showed no increase in adverse maternal/fetal outcomes. High patient satisfaction; providers reported better flexibility but noted digital divide.
Emerging Tools & Future Horizons	2023 -2025	Pilot testing of wearable sensors (blood pressure cuffs, CGMs) integrated into telehealth platforms. Early use of AI for risk prediction. Expansion to perinatal mental health (anxiety, depression).
Telehealth for High-Risk Conditions	Ongoing	In gestational diabetes: telehealth improves postprandial glycemic control, reduces cesarean delivery, decreases clinic visits without adverse perinatal outcomes. In hypertensive disorders: remote BP monitoring allows earlier detection and prevention.
Iran - First Use & Development	1900s - present	First use via telegraph lines >120 years ago. Modern projects began in late 2000s with e-health programs for remote areas. Early systems: teleconsultations, SMS-based messaging, EHR integration. COVID-19 accelerated adoption of antenatal telehealth apps, remote monitoring, and self-care guidance.
Türkiye - First Use & Development	1997 -present	First attempt: UMEDIA Project (1997). Health Transformation Program (2003) emphasized digital health. Development of e-Nabız national health record system enabling patient access and teleconsultation. During COVID-19, rapid scale-up of antenatal telehealth and online prenatal education with positive acceptance.

Although both Iran and Türkiye have rapidly increased the use of telehealth during and following the COVID-19 pandemic, they follow different trends. The centralized policies and e-Nabiz system in Türkiye created an integration nationwide, but the progress in Iran has been more disorganized, and based rather on academic and local initiatives. Both nations share common obstacles, in particular, digital disparity and the lack of infrastructures, but the policy-oriented approach of Türkiye can serve as a more efficient way of how telehealth can be implemented in other countries to improve everyday maternal care (Aydogdu, and Aydogdu, 2013; Rafiee, et al., 2024).

Moving forward, healthcare systems need to evolve from pilot initiatives to full-scale institutionalization by embedding telehealth into national maternal care protocols. Practical actions include developing standardized clinical guidelines, training programs for both providers and patients, and policies for reimbursement and liability. Equally important is ensuring digital equity through affordable connectivity, community-based digital literacy initiatives, and device accessibility, particularly in rural and underserved regions. Investments in secure, HIPAA-compliant platforms, AI-driven risk prediction, and wearable technology integration will enhance personalized care. Countries like Iran and Türkiye, characterized by their rapid yet differing adoption pathways, provide critical lessons on how policy-driven strategies can scale telehealth in a sustainable manner.

Conclusion

By implementing these measures, telehealth can move beyond crisis-driven solutions to become a cornerstone of equitable, cost-effective, and high-quality maternal healthcare globally.

Authors' Contribution

Nikki Maleki, Brandon S. Shaw, Fuat Ince and Ardalan Shariat contributed to the design and implementation of the research, to the analysis of the results and to the writing of the manuscript.

All authors read and approved the final version of the work.

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Conflict of Interest

None.

References

Aydogdu, C., and Aydogdu, O., 2013. An overview of telemedicine in Türkiye. *Biotecnol, an Indian Journal*, 7, pp. 89–101.

Fryer, K., Delgado, A., Foti, T., Reid, C.N., and Marshall, J., 2020. Implementation of

obstetric telehealth during COVID-19 and beyond. *Matern Child Health J*, 24(9), pp.1104–1110

Melton, S., Simmons, S.C., Smith, B.A., and Hamilton, D.R., 2020. *Telemedicine, in: Principles of Clinical Medicine for Space Flight*. New York, NY: Springer.

Rafiee, Z., Eshaghzadeh, N.S.M., Pirani, H., et al, 2024. History of Telehealth in Iran. *jiitm*, 14 (4), pp. 297-306.

Rahmah, L., Sukadiono, S., Mundakir, M., et al, 2025. A Review of Telesurgery in Extreme Settings: A Narrative Review. *Telemed. J e-health Off J Am Telemed Assoc*, 31, pp. 701–715. https://doi.org/10.1089/tmj.2024.0428