

SwasthGarbh – Mobile App for Improving Antenatal Care in Uttarakhand

About the Applicant

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- Type: Academic Institution | Prospective Interventional Study (May 2023–Jun 2025)

Problem Statement / Digital Challenge

- Pregnant women in hilly Uttarakhand lack easy access to doctors & antenatal care
- High rates of missed ANC visits, poor medication adherence, delayed complication detection
- Gap in real-time patient-physician communication post-COVID
- Stakeholders affected: Pregnant women, nursing officers, antenatal medical officers

Digital Tool / Solution Implemented

- SwasthGarbh (Healthy Pregnancy) – bilingual (Hindi/English) 2-way interactive Android app developed with IIT Roorkee
- In-house (outsourced development): IIT Roorkee + AIIMS Rishikesh Dept of OBG
- Key features: ANC visit scheduling & reminders, medication reminders, test result tracking, real-time alert if parameters cross normal range, SOS doctor communication, photo upload, dietary & exercise counselling, post-delivery vaccination schedule

Digital Implementation Highlight

- Rollout: 6 months post-IEC approval (AIIMS/IEC/22/641); CTRI registered (CTRI/2023/05/052368)
- Staff trained: Antenatal Medical Officers + 2 OBG Residents; 112 cases + 114 controls enrolled
- Champion: Dr Anupama Bahadur (Team Lead); IIT Roorkee (tech); AIIMS Rishikesh OPD (site)

Digital Impact

- ↑ ANC visits: Mean 6.25 (cases) vs 5.32 (controls), $p < 0.001$; WHO visit compliance 78% vs 66%
- ↑ Investigation compliance: 80.4% cases vs 58.8% controls ($p < 0.001$); significantly higher NT/NB, dual marker, Level-2 USG uptake
- ↑ Hemoglobin at delivery: 11.68 (cases) vs 10.84 (controls), $p < 0.001$; anemia prevalence 11.6% vs 41.2%
- ↓ Complications: 67.9% cases had none vs 47.4% controls ($p = 0.002$); better BP control at delivery ($p = 0.006$)
- ↑ Dietary & physical activity counselling: 90.2% cases vs 50% controls ($p < 0.001$)
- Higher patient satisfaction on all dimensions: respect, openness, information sharing, care

Key Enablers

Enablers:

- IIT Roorkee academic collaboration for app design
- AIIMS institutional support & IEC approval
- Bilingual (Hindi/English) interface for patient accessibility
- Free app for patients & doctors – zero cost barrier

Challenges:

- Smartphone ownership limited; Android-only (no iOS)
- Connectivity issues in hilly/remote areas
- Convenience sampling limits generalizability

Lessons Learned / Replicability

Top Learnings:

- mHealth bridges access gaps in resource-limited settings – significant ANC compliance improvement even with modest smartphone penetration
- Real-time automated alerts (abnormal parameters/danger signs) are transformative for high-risk pregnancy management
- Two-way communication is key – patients engaged more when they could reach their doctor via the app

What hospitals should consider:

- Integrate ASHA worker login to extend reach (1 doctor : 25 ASHAs : 500-600 patients)
- Add geotagging for critical patient location tracking
- Expand to iOS and regional languages for broader adoption