Research Article

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HOLISTIC REPRODUCTIVE HEALTH FOR ALL: A FEASIBILITY STUDY FOR INTEGRATING AYURVEDA AND YOGA SERVICES TO ADDRESS REPRODUCTIVE HEALTH ISSUES IN URBAN SETTLEMENTS THROUGH MOBILE HEALTH UNIT

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ABSTRACT

Background: Reproductive health disparities in underserved urban populations are compounded by limited healthcare access. This pilot study evaluated feasibility and efficacy of Ayurvedic interventions through mobile health units. Methods: A prospective pilot study was conducted among women aged 20-45 years (n=20) with reproductive health complaints in urban informal settlements. Participants included leucorrhea (n=10), polycystic ovary disease (n=6), and dysmenorrhea (n=4) cases. Treatment consisted of Ayurvedic formulations (Kumari Asava, Ashokaristha) with lifestyle and dietary interventions. Symptom severity was assessed weekly using five-parameter scale (0-3) for eight weeks. Results: All 20 women completed the protocol. Leucorrhea cases showed significant improvements across all parameters (mean reductions 1.3-1.7 points). Polycystic ovary disease participants achieved menstrual cycle regularization (100 percent). Dysmenorrhea cases demonstrated 69 percent pain reduction. Retention rate was 100 percent with 95 percent attendance and 92 percent adherence. Conclusion: Mobile health unit-based Ayurvedic interventions are feasible and potentially efficacious for reproductive health management in underserved populations.

Keywords: Ayurveda, reproductive health, leucorrhea, polycystic ovary disease, dysmenorrhea, mobile health unit

INTRODUCTION

Reproductive health issues including leucorrhea (white vaginal discharge), menstrual irregularities, and infertility remain prevalent among women in underserved urban areas.[1] These populations face healthcare access challenges due to economic constraints, cultural factors, and fragmented service delivery.[2] Ayurveda, the traditional Indian medicine system with over three thousand years of documented practice, offers holistic approaches focusing on constitutional therapies addressing dosha (bio-humor) imbalances through individualized treatment, lifestyle modifications, dietary interventions, and herbal formulations. Mobile health units delivering Ayurvedic care can overcome structural barriers and enhance cultural acceptance in underserved communities.

Maternal health utilization in urban informal settlements is hindered by financial hardship, poor awareness, and socio-cultural restrictions, contributing to maternal morbidity and mortality.[3,4] Traditional medicine systems like Ayurveda may offer culturally acceptable alternatives resonating with prevalent health beliefs.[5] However, evidence on feasibility and clinical outcomes of mobile health unit-based Ayurvedic interventions remains limited. This study evaluates the feasibility and preliminary efficacy of delivering Ayurvedic interventions for reproductive health conditions through mobile health units in urban informal settlements of Bangalore, Karnataka, India.

MATERIALS AND METHODS

Study Design and Setting

A prospective pilot study was conducted through a mobile health unit in urban informal settlements of Bangalore, Karnataka, over eight weeks from January to March 2024.[6] The study combined quantitative symptom monitoring with qualitative feasibility observations.
Ethical clearance number: IRB /SVYM/111/02/2024-25

Study Location: Mobile Health Unit Outpatient Department, Swami Vivekananda Youth Movement, DVG Bhavana, Ghokale Institute of Public Affairs, No. 2/86/1-A, 5th Main, Bull Temple Road, N. R. Colony, Bengaluru, Karnataka 560004, India.

Participant Selection

Inclusion Criteria: Women aged 20-45 years with reproductive health complaints including leucorrhea, polycystic ovary disease, or dysmenorrhea; willingness to comply with eight-week follow-up protocol and provision of informed written consent.

Specific Cohorts

- Leucorrhea cohort (n=10) comprised women with mild to moderate leucorrhea presenting as Shweta Pradar (white vaginal discharge) with abnormal vaginal discharge.
- Polycystic ovary disease cohort (n=6) included women with irregular menstrual cycles manifesting as irregular Artava Pravritti (menstrual flow).
- Dysmenorrhea cohort (n=4) consisted of women with primary dysmenorrhea presenting as Kashta Artava (painful menstruation) with menstrual pain.

Exclusion Criteria: Severe infections requiring immediate medical referral, pregnancy or postpartum period of less than six weeks, active sexually transmitted infections, severe uncontrolled comorbidities including diabetes mellitus or hypertension, and unwillingness to follow protocol requirements.

Treatment Protocol

Ayurvedic Interventions: Participants received standardized Ayurvedic formulations based on classical principles described in traditional texts.[7,11,12] Kumari Asava was administered at 15 millilitres twice daily after meals as per The Ayurvedic Formulary of India,[13] containing Kumari (*Aloe vera*) indicated for menstrual disorders and hormonal balance. Ashokaristha was administered at 15 millilitres twice daily after meals, a traditional formulation for gynaecological disorders,[14,15] containing Ashoka (*Saraca asoca*) indicated for leucorrhea and menstrual irregularities. These formulations target Pitta dosha (fire-water bio-humor) and Vata dosha (air-space bio-humor) imbalances implicated in reproductive tract inflammation.

Lifestyle and Dietary Modifications: All participants received counselling based on Ayurvedic dietary principles including avoidance of processed foods, increased hydration of two to three litres daily, daily consumption of buttermilk, balanced diet with antioxidant-rich foods including fresh fruits and vegetables, and regular yoga practice of 15-20 minutes daily based on evidence-based protocols for reproductive health[16,17] emphasizing pelvic floor strengthening exercises.

Condition-Specific Modifications

- Polycystic ovary disease cases received additional counselling on low-glycaemic diet guidance following Ayurvedic nutritional principles and modern dietary recommendations[18,19] along with menstrual cycle tracking instructions.
- Dysmenorrhea cases were instructed to perform specific yoga asanas including Supta Baddha Konasana (reclined bound angle pose), Balasana (child's pose), and Marjariasana (cat pose) for pain management.

Outcome Measures

Primary Outcomes: A five-parameter Ayurvedic symptom assessment scale (Table I) was utilized, adapted from classical texts including Charaka Samhita and Sushruta Samhita,[20,21] with each parameter scored from 0-3 for severity assessment. The parameters included Kati Sula (lower back pain), Daurbalya (generalized weakness), Kandu (vulvar itching), Daha (burning sensation in genital area), and Daurgandhya (foul odour of vaginal discharge).

Table 1: Five-Parameter Ayurvedic Symptom Assessment Scale

Parameter	Score 0	Score 1	Score 2	Score 3
Kati Sula (Lower Back Pain)	None	Mild (tolerable)	Moderate (interferes with daily function)	Severe (incapacitating)
Daurbalya (Weakness)	None	Post-exertion only	During normal activities	Persistent
Kandu (Vulvar Itching)	Absent	Mild occasional	Moderate (causing erythema)	Severe continuous
Daha (Burning Sensation)	Absent	Mild occasional	Moderate frequent	Severe continuous
Daurgandhya (Foul Odour)	Absent	Mild occasional	Moderate	Severe

Secondary Outcomes: Dysmenorrhea severity was assessed using numerical pain rating scale ranging from 0-10. Polycystic ovary disease outcome was assessed by menstrual cycle regularity defined as cycle length between 28-32 days. Operational feasibility was assessed through attendance rates, treatment adherence rates, and dropout rates.

Assessment Schedule

Baseline Assessment at Week 0: Initial symptom scoring, dietary assessment, and lifestyle evaluation were conducted.
Follow-up Assessments during Weeks 1-8: Weekly symptom re-assessment and treatment adjustments were performed.
Final Assessment at Week 8: Comprehensive outcome evaluation including final symptom scoring and participant feedback collection.

Data Analysis
Descriptive statistics were employed. Mean symptom scores with standard deviations were calculated at baseline and week eight. Within-group changes were described. Attendance and adherence rates were calculated as percentages. Qualitative observations were thematically organized.

RESULTS

Participant Characteristics
Twenty women successfully completed the eight-week protocol achieving 100 percent completion rate. The study cohorts comprised leucorrhea cases (n=10), polycystic ovary disease cases (n=6), and dysmenorrhea cases (n=4). Mean age ranged from 28-35 years. All participants reported poor baseline adherence to traditional Ayurvedic practices.[8]

Leucorrhea Cohort Outcomes
Weekly symptom monitoring demonstrated consistent progressive improvement across all five parameters (Table 2).

Table 2: Leucorrhea Cohort Symptom Scores (n=10)

Symptom Parameter	Baseline Mean ± SD	Week 8 Mean ± SD	Mean Change
Kati Sula	2.1 ± 0.6	0.8 ± 0.4	-1.3
Daurbalya	2.0 ± 0.7	0.6 ± 0.5	-1.4
Kandu	2.4 ± 0.5	0.7 ± 0.5	-1.7
Daha	2.2 ± 0.6	0.5 ± 0.5	-1.7
Daurgandhya	2.3 ± 0.5	0.6 ± 0.5	-1.7

All ten participants demonstrated meaningful clinical improvement. Most significant reductions occurred for itching, burning sensation, and foul odour parameters (1.7 points). Progressive decline was evident between weeks two to four.

Polycystic Ovary Disease Cohort Outcomes
All six participants presented with irregular baseline cycles (35-90 days). Following eight-week intervention, all achieved regular cycles (28-32 days) by week eight, representing 100 percent success rate. Participants reported subjective improvements in energy levels and reduced menstrual discomfort.

Dysmenorrhea Cohort Outcomes
Pain scores demonstrated progressive reduction: Baseline 7.5 ± 0.9, Week 2: 6.2 ± 1.1, Week 4: 4.8 ± 1.3, Week 6: 3.5 ± 1.4, Week 8: 2.3 ± 1.0. Mean pain reduction was 5.2 points (69 percent). All participants reported improved pain control and functional capacity.

Operational Feasibility
Attendance rate: 95 percent (190/200 visits). Treatment adherence: 92 percent (at least 80 percent compliance). Dropout rate: zero percent. Participants cited accessibility, cultural congruence, and structured follow-up as key acceptance factors.

DISCUSSION

This pilot study demonstrates that mobile health unit-based Ayurvedic interventions are feasible and potentially efficacious for reproductive health management in underserved populations, achieving 100 percent retention, 95 percent attendance, and 92 percent adherence rates.

The leucorrhea cohort showed clinically meaningful improvements (mean reductions 1.3-1.7 points) across all parameters. These findings align with classical literature describing therapeutic properties of Kumari Asava and Ashokaristha in managing Shweta Pradar (white vaginal discharge).[9] According to Ayurvedic pathophysiology, leucorrhea results from aggravated Kapha dosha (water-earth bio-humor) mixing with vitiated Pitta dosha (fire-water bio-humor) and Vata dosha (air-space bio-humor), affecting the reproductive tract.[9,22,23] Ashokaristha contains Ashoka (*Saraca asoka*) possessing Kashaya rasa (astringent taste) and Sheeta virya (cooling potency) properties balancing Pitta dosha as documented in pharmacological studies.[24,25] Kumari Asava contains Aloe vera (*Aloe barbadensis*) with cooling properties and hormonal balancing effects through endocrine modulation.[26] Progressive symptom decline between weeks two to four suggests dose-dependent response consistent with Ayurvedic pharmacological principles.

For polycystic ovary disease, achieving menstrual cycle regularization in all participants represents significant clinical outcome. From Ayurvedic perspective, the condition involves Kapha-Vata dosha imbalance leading to irregular Artava Pravritti (menstrual flow), associated with Meda dhatu (adipose tissue) accumulation.[27,28] The intervention addressed these through low-glycaemic diet reducing Meda dhatu, Kumari Asava for hormonal balance, and yoga improving pelvic circulation. The synergistic combination contributed to cycle regularization through complementary mechanisms.

Dysmenorrhea cases demonstrated 69 percent pain reduction. From Ayurvedic perspective, dysmenorrhea classified as Kashta Artava (painful menstruation) is caused by aggravated Vata dosha causing uterine spasm as described in classical texts.[29] Kumari Asava balances Vata through nutritive properties, while yoga asanas reduce muscle tension and improve pelvic blood flow supported by clinical evidence.[30] Progressive pain reduction suggests cumulative benefits rather than symptomatic relief.

The mobile health unit model effectively addressed structural barriers by eliminating transportation costs and overcoming geographical barriers, making the disease management accessible to the patients in need. Cultural congruence with traditional beliefs contributed significantly to high engagement. This cultural acceptability represents significant advantage of traditional medicine in serving populations facing cultural barriers to modern healthcare.

However, limitations include small sample size (n=20), absence of control group limiting causal inference, insufficient eight-week follow-up for long-term outcomes, restriction to Bangalore limiting generalizability, absence of objective laboratory markers, and inability to determine individual component contributions due to synergistic intervention design.

Future research should employ randomized controlled trials with adequate sample sizes, extended follow-up (at least 6-12 months), objective outcome measures (hormonal assays, microbiological cultures, ultrasound imaging), cost-effectiveness analyses, and multicentred studies across diverse settings.

CONCLUSION

This feasibility study successfully achieved its stated objectives demonstrating that mobile health unit-based Ayurvedic interventions for reproductive health are operationally viable, culturally acceptable, and potentially efficacious in underserved urban populations. The primary feasibility objective was achieved through 100 percent retention, 95 percent attendance, and 92 percent adherence, indicating Ayurvedic protocols can be successfully delivered through mobile platforms with systematic monitoring. The secondary efficacy objective showed promising results: leucorrhea cases demonstrated clinically meaningful improvements (mean reductions 1.3-1.7 points across five parameters), all polycystic ovary disease participants achieved cycle regularization, and dysmenorrhea cases experienced 69 percent pain reduction. The mobile health unit model successfully addressed access barriers while maintaining cultural congruence. These preliminary findings support larger randomized controlled trials with objective outcome measures, extended follow-up, and economic evaluations to inform policy decisions regarding traditional medicine integration within public health systems for improving reproductive health access in marginalized communities.

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ABBREVIATIONS

Int. J. Res. Ayurveda Pharm. - International Journal of Research in Ayurveda and Pharmacy
PCOD - Polycystic Ovary Disease
CTRI - Clinical Trials Registry India
AYUSH - Ayurveda, Yoga and Naturopathy, Unani, Siddha and Homoeopathy

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