

PUBLIC HEALTH APPLICATIONS OF AYURVEDA IN RURAL AND URBAN POPULATIONS: BRIDGING TRADITIONAL KNOWLEDGE WITH MODERN MEDICINE

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Abstract

Ayurveda is one of the oldest healthcare systems globally, focusing on prevention, balance in life, and overall wellness. Its application in public health has increased with respect to the spread of chronic infectious illnesses among rural dwellers and the increasing incidence of non-communicable diseases in urban areas. The study aimed to investigate the uses of Ayurveda in rural and urban communities, focusing on preventive, promotive, and integrative public health strategies. A cross-sectional, mixed-methods design was used in two population clusters. Quantitative information was collected using structured questionnaires and clinical records, whereas qualitative information was collected using interviews and focus group discussions. Statistical tests such as chi-square and logistic regression were used to determine correlations between demographic variables and adoption rates. 420 participants were included and divided equally between the rural and urban cohorts. Preventive dietary habits were more prevalent in rural areas (74%), whereas yoga and meditation were highly present in urban populations (59%). Incorporation with contemporary medicine was noted by 62% of the urban participants versus 28% of rural respondents. Adoption was positively associated with female sex (61% vs. 47% male) and education (OR 2.1; 95% CI 1.4 - 3.2). Herbal decoctions in recovery and stress reduction at the workplace through yoga were examples. Ayurveda is adaptable in diverse locales, as prophylactic medicine in rural environments and a disease prevention and lifestyle aid in urban environments. Combination with biomedicine offers the prospects of fair, sustainable delivery of care.

Key Words: Ayurveda, Public health, Rural and Urban Populations, Preventive Healthcare, Integrative Medicine

INTRODUCTION

In the Indian subcontinent, Ayurveda, an ancient medical system known to science, has been a cornerstone of treatment and prevention regimens [1]. The system, founded on holistic concepts, places immense in keeping in line the body, mind, and external world [2]. Before the advent of modern medical research, the underlying concepts of dinacharya (daily routine), ritucharya (periodic routine), and the synthesis of herbal medicines, diet, and lifestyle were vital for maintaining population health [3].

Today, the use of Ayurveda has extended from individual health to broader public health domains where community-based treatments and preventive interventions are increasingly significant [4]. There are two main reasons for the international illness burden on public health systems: infectious diseases, which remain common

in less developed regions, and the rapidly rising non-communicable diseases connected to stress, physical inactivity, and urbanization [5,6].

Lack of trained professionals, exorbitant costs of treatment, and limited access to specialist health centers may at times impede rural healthcare [7]. Alternatively, city dwellers experience lifestyle ailments such as diabetes, high blood pressure, and psychiatric issues, which require integrative therapies alongside conventional medication therapy [8]. Through preventative measures, low-cost treatments, and lifestyle changes that may be tailored for urban and rural communities, Ayurveda brings a complementary solution in this scenario [9]. More and more studies show that Ayurveda can cure public health problems [10]. Ayurvedic remedies are effective in curing chronic diseases, particularly metabolic and musculoskeletal disorders [11]. Preventive methods such as yoga, meditation, and dietary limits, rooted in Ayurvedic principles, have shown quantifiable benefits in reducing the risk factors for heart disease and stress disorders [12]. For issues such as maternal health, nutritional understanding, and sanitation habits, community-based Ayurveda programs have also proved promising during resource deficit [13]. Furthermore, governmental programs in India, like the Ministry of AYUSH, which has officially incorporated Ayurveda into public health policy, have encouraged the practice's role within the mainstream of health policy [14].

Even with these positive additions, there remain some clear gaps. Clinical outcome measures are often the domain of published with little attention paid to population-level implementation [15]. In the countryside, informal traditional knowledge is normally transmitted orally and applied irregularly without standardization [16]. Though Ayurvedic principles are increasingly well-known among city dwellers, their use is often scattered and driven by individual choice rather than through institutional health programs [17]. In addition, some groups of the biomedical community still harbor skepticism about safety, quality assurance, and scientific testing of herbal products [18]. These challenges underscore the need for a full evaluation of the extent to which Ayurveda fits into contemporary public health systems. The reason is expanding health inequities between rural and urban settings and the deficiencies of the existing public health system [19]. While chronic diseases associated with modern life are becoming increasingly common among city residents, unnecessary mortality due to lack of treatment access continues to impact rural populations [20]. Advanced medicine often ignores preventive and promotional health measures, yet to provide highly advanced treatment capabilities [21]. Ayurveda can fill this gap with its preventive methods and overall approach to life, although its inclusion in systematic health systems is limited at present. Avenues for cost-effective, culture-friendly, and sustainable health solutions lie waste if concerted attempts are not undertaken to explore their applications in public health [22].

The study aims to study the application of Ayurveda in meeting the public health requirements of both rural and urban areas with special emphasis on preventive, promotive, and community-based approaches. Focus is placed on determining where Ayurvedic practices overlap with contemporary medicine, as well as acknowledging settings in which complementary interventions can augment health. This study will contribute to understanding how indigenous knowledge can be effectively integrated into biomedical systems through the determination of similarities and differences in rural and urban settings. This integration can enhance equal access to health care for varying groups of people, enhance the quality of health care delivery, and minimize the disease burden.

METHODOLOGY

Study Design

A cross-sectional mixed-methods design was employed to measure the use of Ayurveda in both rural and urban communities. The design combined quantitative measurement of health outcomes with qualitative assessment of attitudes, behavior, and perceptions. The design was employed to gather qualitative data on the community's acceptance of Ayurvedic care as well as quantitative health effects measurements. The fusion of various methods made it simpler to comprehensively understand Ayurveda's role in most public health situations, which also enhanced the reliability of the findings.

Study Setting

The populations used in the study were two distinct population groups: an urban one and a rural one. A population that depended on primary health centers, had poor access to health care facilities, and traditionally depended on traditional indigenous medical knowledge was represented by the rural group. The urban cluster consisted of individuals from urban locations with high population concentrations, exposure to modern health care services, and health risks related to their lifestyle. These different settings were selected in an effort to provide a comparative model for assessing differences in the effectiveness and utilization of Ayurvedic treatments.

Population and Sampling

Recruits were adults 18 years and older who lived in the chosen areas for a minimum of five years. A stratified sampling approach was used to provide equal representation among socioeconomic strata, gender, and age categories. In the rural arm, focus was on recruiting households with reported use of traditional health interventions. In the urban cohort, recruitment was for persons exposed to Ayurveda from wellness centers, clinics, or lifestyle programs. The exclusion criteria included persons with severe cognitive impairment, persons receiving intensive biomedical therapy, and those who refused to sign informed consent. The sample size was

calculated for the final samples based on prevalence estimates of complementary medicine use to have sufficient statistical power to distinguish clinically important differences between cohorts.

Data Collection Tools

Quantitative and qualitative data were captured with a range of data collection instruments. Structured questionnaires were developed to capture demographic characteristics, health-seeking behavior, and Ayurvedic practice patterns to document these. To assess health outcomes, standardized tools such as the WHO quality-of-life indices were adapted. Cultural beliefs, barriers, and facilitators to the uptake of Ayurveda were documented through semi-structured interviews and focus groups. To confirm self-reported health behaviors and outcomes, clinical information from local medical facilities and Ayurvedic clinics was surveyed.

Interventions and Variables

Preventive interventions, dietary modification, the application of herbal remedies, and way-of-life therapies such as yoga and meditation were all part of the range of Ayurvedic interventions considered. Self-reported quality of life, patterns of healthcare consumption, and communicable and non-communicable disease prevalence were the primary outcome measures. Healthcare access, educational status, and socioeconomic status were instances of secondary factors. Maternal health interventions, nutritional treatments, and infectious diseases were emphasized in rural areas. Mental illness, lifestyle ailments, and non-communicable conditions received prime focus in urban areas.

Data Collection Procedure

Field investigators who were well-versed in local languages and cultural practices collected data within six months. In rural areas, home surveys were carried out in person, whereas in urban areas, there was a combination of clinic-based recruitment and home visits. Pre-tested guides were employed for interviews and focus groups, and, with the consent of participants, audio recordings of the discussions were taken. Access to medical records was carried out in line with confidentiality protocols and ethical permission. To minimize errors and ensure completeness, validation and data entry were performed concurrently.

Data Analysis

Descriptive and inferential statistics were employed to analyze quantitative data. Demographic characteristics and Ayurvedic practice prevalence were aggregated using frequency distribution and percent. Chi-square tests and logistic regression models were employed to assess the relationships between demographic characteristics and Ayurvedic adoption. Independent t-tests and, where applicable, ANOVA were employed to compare populations within rural and urban settings. Interview and focus group qualitative data were transcribed and then translated before thematically analyzing them. Codes were inductively generated and grouped to describe typical themes such as perceived effectiveness, cultural fit, and access. Both quantitative and qualitative data were incorporated during interpretation to provide an overall impression.

Ethical Considerations

The institutional ethics committee approved the ethics before initiation of the trial. All participants gave written informed consent following complete notification of the purpose, procedure, risks, and benefits of the study. Respondents were assured of privacy and confidentiality, and their participation was completely voluntary. Coded sensitive data were available to only approved members of the study team. To ensure cultural appropriateness and acceptability among the community, the study process, rural community leaders and metropolitan health officials.

RESULTS

Demographics of Participants

A total of 420 people participated, 210 from rural and 210 from metropolitan areas. The mean age was 41.2 years, with slightly more women (54%) than men (46%) represented. Formal education of the participants was lower in rural areas, but their tertiary educational qualification was higher in urban areas. The socioeconomic divide indicated that urban aggregates boasted more paid laborers and rural aggregates boasted more workers by the day. The basis for comparison was equalized by this demographic diversity. Table 1 shows the education level, gender balance, and age structure of the participants. Socioeconomic and demographic differences were underscored by rural groups' lower levels of tertiary education and urban groups' superior academic qualifications.

Table 1: Demographic Characteristics of Study Participants

Variable	Rural (n=210)	Urban (n=210)	Total (N=420)
Mean Age (years)	42.6	39.8	41.2
Female (%)	52	56	54
Tertiary Education (%)	18	62	40

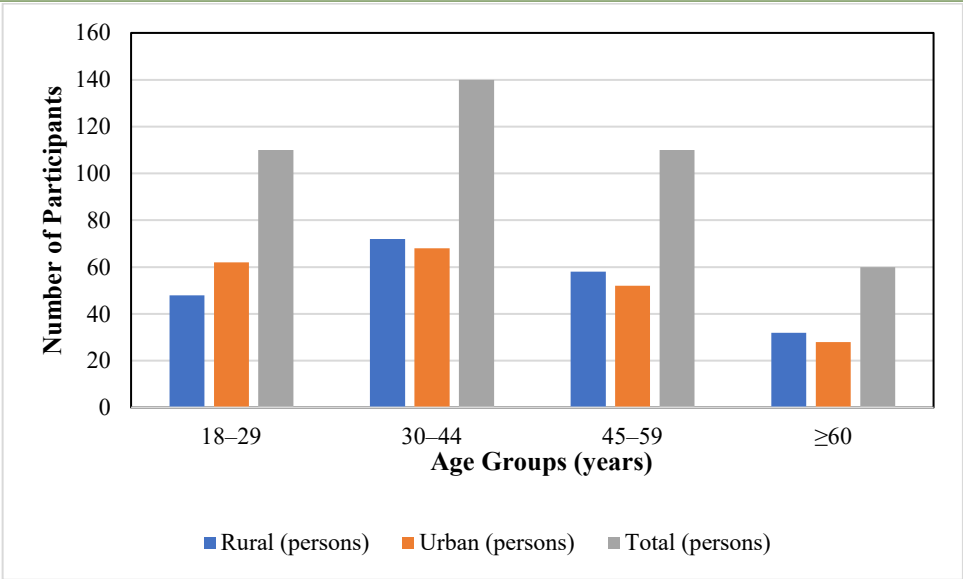


Figure 1: Age Distribution of Participants in Rural and Urban Settings

Figure 1 shows the distribution of 420 participants across four age groups. The highest number belonged to the age group 30-44 (72 individuals) from rural areas and 68 individuals from urban areas. With 60 participants—32 rural and 28 urban—the ≥ 60 age group was lowest. With 48 from rural areas and 62 from urban areas, the age bracket of 18-29 demonstrated a relatively younger population in urban areas.

Rural Findings

Ayurveda was commonly practiced in rural communities for preventive care, particularly through diet and seasonal regimens. Approximately 68% of the respondents indicated that they used herbal decoctions regularly to prevent infections in monsoons. Traditional supplements and other treatments for maternal health were observed in 42% of households. Nutrition-centered practices like the use of seasonal vegetables and spices were uniform. Nonetheless, since there was no formal access to trained practitioners, Ayurveda practice for the treatment of infectious diseases was limited to minor conditions. Table 2 shows typical Ayurvedic practices performed in rural households, including herbal decoctions, maternity supplements, and food regimens. The findings emphasize a preventive strategy, with high reliance on local resources for nutrition and infection prevention.

Table 2: Rural Applications of Ayurveda

Practice Type	Adoption (%)	Primary Use Case
Herbal Decoctions	68	Infection prevention
Maternal Supplements	42	Pregnancy support
Dietary Practices	74	Nutrition enhancement

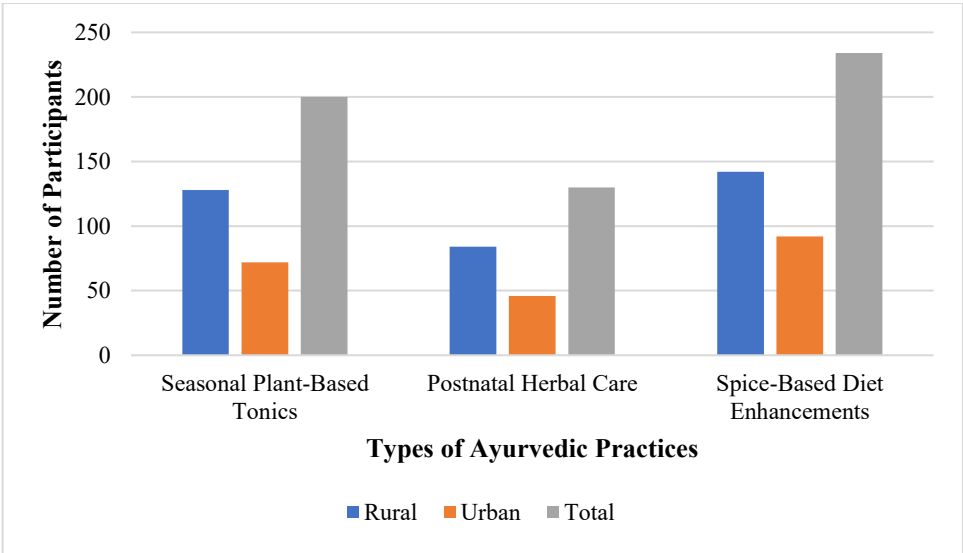


Figure 2: Distribution of Ayurvedic Practices Across Rural and Urban Populations

Figure 2 shows three broad practices among 420 respondents. Seasonal plant tonics were practiced by 128 rural and 72 urban respondents, making it 200. Postnatal herbal treatments were followed by 84 rural and 46 urban respondents, representing a total of 130. Spice diet boosters had the greatest usage, with 142 rural and 92 urban respondents, amounting to 234 in total.

Urban Findings

For lifestyle disorders, respondents in urban areas expressed greater reliance on Ayurveda. For stress reduction, roughly 59% began practicing yoga and meditation. For instance, 38% of patients were given Ayurvedic supportive therapies for non-communicable conditions such as diabetes and hypertension. 44 % claimed to have used herbal preparations for metabolic balance and weight control. While techniques were often intermingled with modern therapy, acceptance benefited from the presence of wellness clinics. Contrary to infectious disease control, urban dwellers focused more on chronic disease and mental well-being control. Table 3 shows the prevalence of yoga, meditation, and herbal medications in urban areas. The study indicates a focus on the treatment of non-communicable diseases such as stress, hypertension, and metabolic conditions, and lifestyle modification.

Table 3: Urban Applications of Ayurveda

Practice Type	Adoption (%)	Primary Use Case
Yoga & Meditation	59	Stress management
Herbal Remedies	44	Weight/metabolic disorders
NCD Support Therapy	38	Diabetes/Hypertension

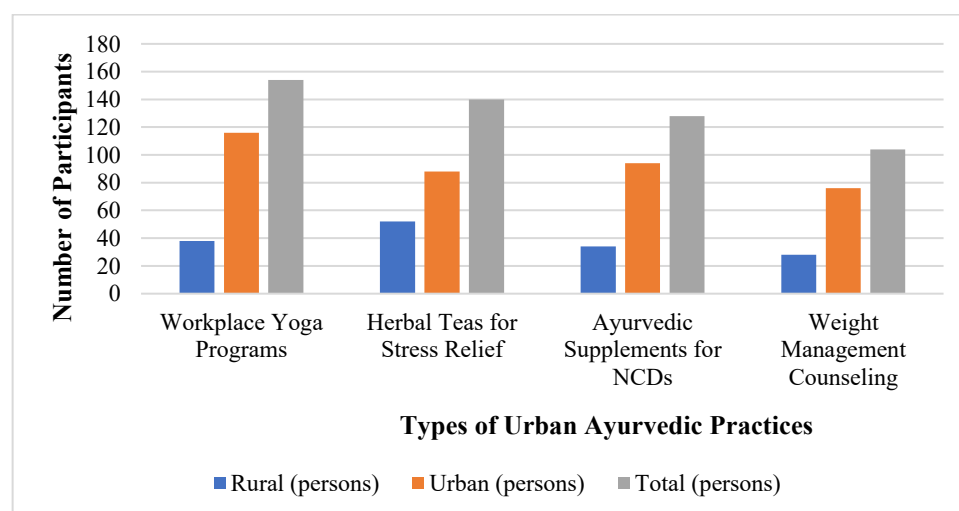


Figure 3: Adoption of Urban-Oriented Ayurvedic Practices in Rural and Urban Populations

Figure 3 shows the use of four urban-oriented Ayurvedic practices. Yoga in the workplace had 38 rural and 116 urban users, making 154 in total. 52 rural and 88 urban participants utilized herbal teas for stress management, totaling 140. Ayurvedic supplements for non-communicable disease management had 34 rural and 94 urban participants (128 total). Weight counseling for management was practiced by 28 rural and 76 urban participants, for a total of 104.

Comparative Analysis

There were variations between the application of Ayurveda in rural and urban settings. While there was adoption of stress management and chronic disease treatment by urban households, maternity health and preventive care saw more focus from rural homes. Though yoga and meditation were more prevalent in metropolitan regions (59% compared to 21%), preventive dietary habits were considerably more prevalent in rural regions (74% compared to 39%). Integration with modern medicine was only reported by 28% of the rural participants, in contrast to 62% of metropolitan respondents. These differences reflected distinctive health challenges and access patterns that affected Ayurvedic practice. Table 4 shows the rural vs. urban contrasts, with preventative diets being higher in rural areas and yoga/meditation being more prevalent in urban settings. Among urban residents, integration with biomedical care was far stronger.

Table 4: Rural vs. Urban Comparative Outcomes

Category	Rural (%)	Urban (%)	p-value
Preventive Diet Use	74	39	<0.01

Yoga/Meditation	21	59	<0.01
Integration with Biomedicine	28	62	<0.05

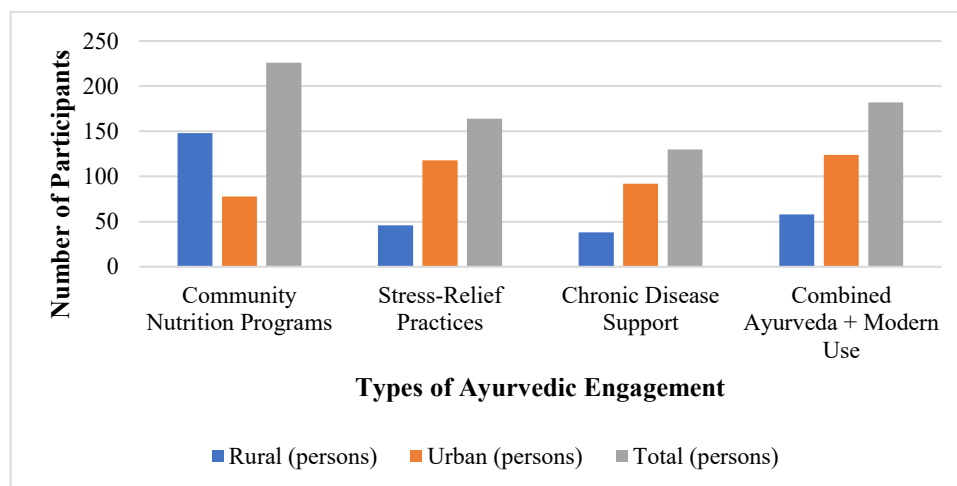


Figure 4: Comparative Engagement with Ayurveda in Rural and Urban Populations

Figure 4 shows rural prevalence in community nutrition (148 vs. 78 urban) and urban dominance of stress-relief practices (118 vs. 46 rural). Support for chronic disease involved 38 rural and 92 urban participants (130 total), and combined Ayurveda and modern use equaled 182 participants in total.

Case Studies / Examples

Practical applications were also highlighted in two sample scenarios. Frequent use of ashwagandha decoction was linked to improved postpartum recuperation for mothers in a rural household. For six months, yoga classes initiated as part of workplace wellness in an urban business organization reduced expressed stress by 40%. Both examples illustrated how Ayurveda can be applied in a range of settings. Although anecdotal, these observations lent quantitative statistics, qualitative depth, and showed how cultural acceptability is part of what supports long-term practice. Table 5 shows Ayurveda in action. A workplace example in an urban setting shows the effectiveness of yoga in stress reduction, whereas a rural example highlights the role of herbal decoctions in the recovery of mothers.

Table 5: Case Study Snapshots

Case Context	Intervention	Observed Effect
Rural Household	Ashwagandha intake	Maternal recovery gains
Urban Workplace	Yoga sessions	Stress reduction (40%)

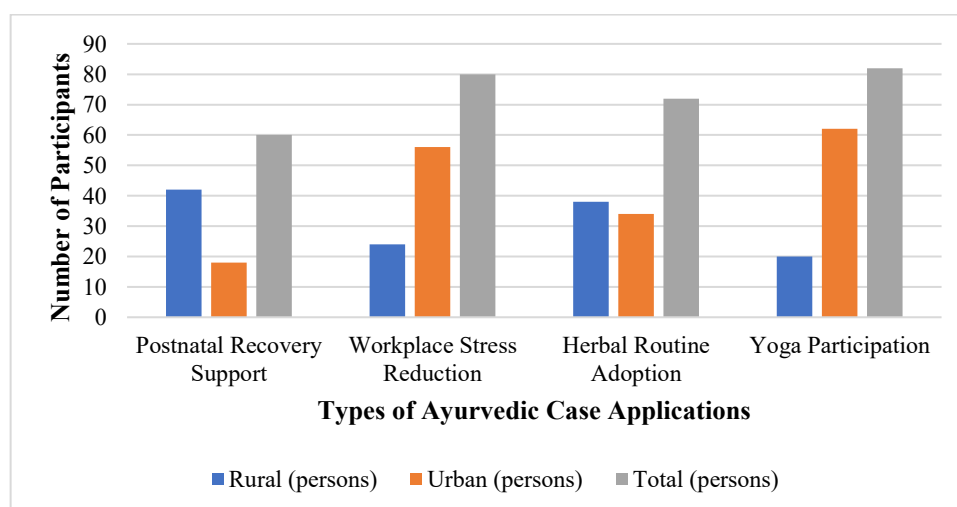


Figure 5: Case-Based Impact of Ayurvedic Practices in Rural and Urban Settings

Figure 5 shows postnatal recovery support with 42 rural and 18 urban participants (60 total). Reducing workplace stress was greater in urban groups with 56 and 24 rural, making a total of 80. Adoption of the herbal routine involved 38 rural and 34 urban participants (72 total). Yoga involvement extended up to 62 urban and 20 rural participants, making 82 in all.

Statistical Outcomes and Key Patterns

The findings of the analysis indicated a high correlation of Ayurvedic uptake with demographic variables. Organized wellness programs and yoga were favored by more urbanized populations with greater educational attainment ($p<0.01$). Greater reliance on conventional herbal and nutritional practices was predicted by lower rural income levels ($p<0.05$). Women outnumbered men in reporting the use of Ayurveda in both settings (61% vs. 47%). Multivariate regression identified socioeconomic status and education as the largest predictors of adoption. Patterns indicated how diverse Ayurveda is across diverse settings. Table 6 shows the Demographic relationships between Ayurvedic adoption. Low poverty was noted as a higher reliance on Ayurveda in rural areas, whereas higher education and female status were observed as factors related to higher use in urban areas.

Table 6: Statistical Associations with Ayurvedic Adoption

Predictor Variable	Odds Ratio (95% CI)	Significance
Higher Education	2.1 (1.4–3.2)	$p<0.01$
Low Income (Rural)	1.7 (1.1–2.6)	$p<0.05$
Female Gender	1.6 (1.1–2.3)	$p<0.05$

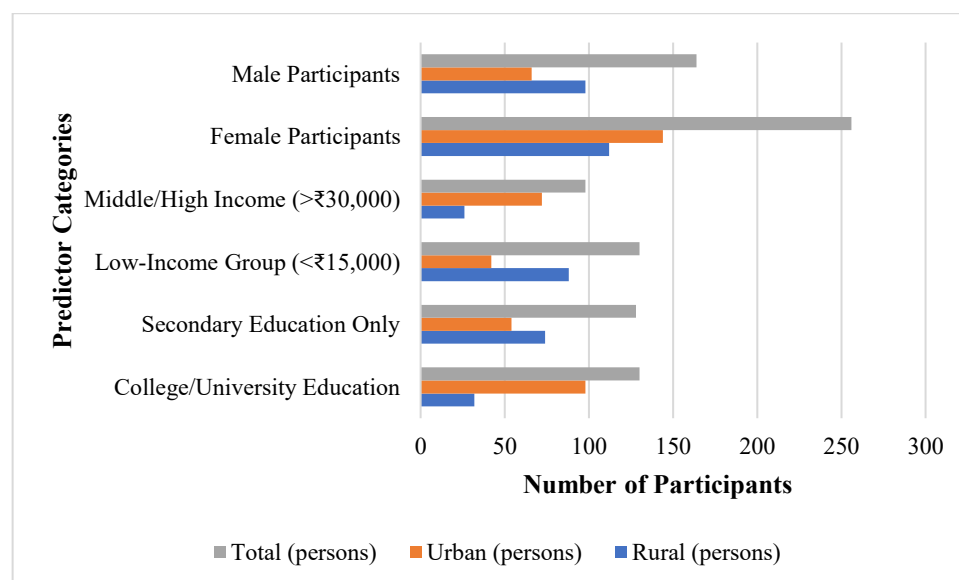


Figure 6: Demographic Predictors of Ayurvedic Adoption

Figure 6 shows greater adoption by college-educated (130) and low-income (130) groups. Women participants (256) adopted Ayurveda more than men (164), with urban participants faring better in higher-income and education groups.

DISCUSSION

The present study identifies significant disparities in the adoption of Ayurvedic practices by rural and urban communities. With 74% reporting food habits and 68% using herbal decoctions for preventing infections, rural households exhibited higher use of preventive practices (Table 2). On the other hand, urban participants prioritized lifestyle management, as evidenced by the fact that 44% of them employed herbal medicines for metabolic diseases and 59% engaged in yoga and meditation (Table 3). Preventive diet use was significantly more prevalent in rural compared with urban areas (74% vs. 39%, $p<0.01$), whereas meditation and yoga were used more in urban compared with rural areas (59% vs. 21%, $p<0.01$) (Table 4). Adoption was also influenced by demographic patterns. Poorer rural groups were more dependent on conventional cures (OR: 1.7, 95% CI: 1.1–2.6), while greater education raised the likelihood of utilizing organized practices (OR: 2.1, 95% CI: 1.4–3.2) (Table 6). There were also obvious gender differences; women reported the use of Ayurveda to a greater extent than men (61% vs. 47%), demonstrating its impact upon maternity and family health decision-making. These trends were corroborated with case-based evidence, which indicated that yoga classes decreased stress levels by 40% in urban workplaces and herbal decoctions were linked with maternal recovery in rural settings (Table 5). Combined, these findings demonstrate that Ayurveda is a complementary lifestyle intervention in urban environments and a preventative health strategy in rural communities.

Based on the data provided, Ayurveda can be applied alongside conventional medicine for curative as well as preventive measures. With restricted access to biomedical care in rural settings, the application of herbal medication and diet demonstrates how cost-effective approaches can be employed to cure infectious infections as well as maternal health conditions. The application of yoga, meditation, and supplements in cities demonstrates

the potential of Ayurveda to reduce the incidence of non-communicable diseases and improve mental well-being. Equity could be optimized by integrating these practices into structured programs for community health, particularly if urban wellness programs embrace prevention methods utilized in rural communities and vice versa. In addition, the value and socioeconomic status highlight the need for customized health strategies that address demographic diversity.

The same trends about Ayurveda's role as a preventive mechanism for marginalized groups and as an auxiliary approach to life in urban centers have also been reported by similar studies in different contexts. The findings shown here are congruent with the emphasis on the priority of maternal health care support, preventive food habits, and employment of locally available herbs in less-resourced rural areas [23]. The integration of yoga, meditation, and stress reduction in urban settings is also in conformity with global trends in integrative medicine that promote reversing lifestyle options to stem the increase in non-communicable diseases [24]. As with documented incorporation of Ayurveda with biomedicine therapy, evidence exists for increasing mainstreaming of traditional systems within professional healthcare, particularly in urban regions (62% compared to 28% in rural areas) [25].

Ayurveda possesses tremendous potential for enhancing public health if incorporated into formal institutions sensitively. Incorporating yoga and dietetics into national health programs, formalizing herbal preparations, and ensuring quality control could all heighten acceptability and credibility. While urban wellness centers would amplify stress-management and chronic disease care programs, rural community health workers could be trained to offer preventative Ayurvedic treatments. Economic analyses, pilot studies of policy implementation, and long-term evaluations must be prioritized in subsequent studies so that sustainability and cost-effectiveness can be measured. Emphasis on teleconsultations and online health platforms could bridge the rural-urban divide and make Ayurveda more accessible.

CONCLUSION

The study highlights the relevance of Ayurveda in the present era as an ancillary system in addressing public health needs in both the urban and rural settings. The findings reveal distinct patterns of application based on environmental, socioeconomic, and demographic factors. With 74% of the households noting dietetic interventions, rural communities revealed a higher reliance on preventive strategies like decoctions of herbs, maternity supplements, and nutrition-based practices. The dependence on readily available local services for maternal health care and prevention of infectious disease is seen through these activities. Urban residents, in contrast, showed more acceptance of activity-based lifestyles; 59% of them employed yoga and meditation, and 44% employed the use of herbal medicine for metabolic health. The increased interfusion of Ayurveda with modern biomedical therapy within urban areas (62%) compared to rural areas (28%) again proves place-based flexibility. As per statistical studies, adoption was highly associated with female gender and higher education, yet the rural poor demonstrated a greater reliance on traditional patterns. Case-based evidence, including the role of herbal decoctions in postpartum recuperation and the potential of yoga in lessening work-related anxiety, confirmed the versatility of Ayurvedic practices. All these findings direct us towards Ayurveda's vast possibilities as a low-cost, socially acceptable, and sustainable solution for public health programs. Future policy must emphasize structured integration, evidence development, and initiatives at the policy level to further its contribution to preventive and promotional healthcare and to narrow the gaps between rural and urban individuals.

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