

ORIGINAL RESEARCH ARTICLE

Integration of Ayurvedic Knowledge in School Education: A Study from Varanasi

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ABSTRACT

Background: This study investigates the integration of Ayurvedic knowledge in school education by analyzing the National Council of Educational Research and Training (NCERT) textbooks (Classes 6–12) and assessing awareness among senior secondary students in Varanasi city.

Objectives: The research aims to evaluate the representation of Ayurveda in NCERT textbooks and to measure students' awareness and understanding of Ayurvedic concepts across different demographic variables such as gender and school type.

Methodology: Employing a descriptive survey design, data were collected from 847 students across government and private schools. The NCERT textbooks were systematically reviewed for content related to health, hygiene, diet, yoga, and traditional medicine.

Results: The findings revealed that while most students possessed a moderate level of awareness regarding Ayurveda, only a limited proportion demonstrated high knowledge. Female students and those from private schools exhibited significantly higher awareness levels. Chi-square analysis confirmed statistically significant associations between awareness, gender, and school type.

Conclusion: The study highlights a notable gap between curricular representation and actual student awareness, underscoring the need for structured, experiential, and equitable integration of Ayurvedic concepts in school education.

Recommendations: Curriculum enhancement, experiential learning initiatives, teacher capacity building, and alignment with the National Education Policy (NEP) 2020 are recommended. The findings provide meaningful insights for policymakers, educators, and curriculum developers to promote the effective inclusion of Indian Knowledge Systems in contemporary education.

1. INTRODUCTION

Ayurveda, the traditional system of medicine that originated in India, represents one of the oldest holistic approaches to health and well-being. Rooted in the Vedic tradition, it emphasizes balance between body, mind, and environment through principles of diet, lifestyle,

and natural remedies. In contemporary times, Ayurveda has regained significance not only in healthcare but also as a cultural and intellectual heritage that requires preservation and transmission to younger generations. Education plays a vital role in this transmission, ensuring that students develop both awareness and appreciation for indigenous knowledge systems.

In recent years, the Government of India has emphasized the integration of traditional knowledge systems, including Ayurveda, within the mainstream educational framework. The National Education Policy (NEP) 2020 specifically highlights the importance of promoting Indian

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Knowledge Systems (IKS) as part of school curricula, aiming to make learning more holistic, experiential, and rooted in cultural heritage.^[1] This policy initiative provides a strong rationale for examining the existing representation of Ayurveda in school education and its impact on student awareness.

School textbooks, particularly those developed by the National Council of Educational Research and Training (NCERT), are central to curriculum delivery in India. They not only reflect national educational priorities but also shape the worldview of students. While Ayurveda-related concepts such as health, hygiene, nutrition, yoga, and lifestyle practices are embedded across various subjects, it remains unclear how deeply students engage with these ideas or whether they translate into meaningful awareness.

Varanasi, a historic center of Ayurveda and traditional learning, provides an important context for such an inquiry. Despite its rich cultural heritage, the actual level of awareness among students in urban schools may be influenced by factors such as curriculum design, teaching practices, and socio-economic differences between government and private schools. Hence, assessing both curricular representation and student awareness offers valuable insights into the extent of Ayurveda's integration into education.

Against this background, the present study seeks to explore the integration of Ayurvedic knowledge in school education by analyzing NCERT textbooks from Classes 6 to 12 and surveying the awareness levels of senior secondary students in Varanasi. The findings aim to highlight existing gaps and propose directions for strengthening the role of Ayurveda in formal education, in alignment with the goals of NEP 2020.

2. REVIEW OF LITERATURE

The roots of Ayurveda can be traced to the Vedic period, with the *Atharva Veda* containing the earliest references to health, disease, and treatment. Classical texts such as the *Charaka Samhita*, *Sushruta Samhita*, and *Ashtanga Hridaya* further systematized Ayurvedic principles, laying the foundation for preventive and curative healthcare. Over centuries, Ayurveda has been transmitted through both oral traditions and formal education, forming an integral part of India's knowledge heritage.

Several scholars have emphasized the relevance of Ayurveda in modern contexts. Studies highlight its role in promoting preventive healthcare, healthy lifestyle practices, and sustainable living (Sharma, 2019; Patwardhan, 2021).^[2] Research further suggests that awareness of Ayurveda among younger populations remains limited, often shaped by family practices rather than formal education (Deshpande, 2020).^[3] These points highlight the need for systematic curricular inclusion to ensure that students acquire authentic knowledge rather than a fragmented understanding.

In terms of curriculum, the NCERT textbooks are central to India's school education system, offering uniformity across states. Content analysis of these textbooks reveals that Ayurveda is not taught as a separate subject, but elements related to traditional medicine, health, and lifestyle are integrated across science, social science, and biology curricula. For instance, topics such as balanced diet, personal hygiene, medicinal plants, and yoga are included at different grade levels (NCERT, 2006–2019).^[4] However, studies note that these references are often brief, lacking depth and context (Rao and Gupta, 2018).^[5]

The importance of integrating indigenous knowledge systems in school education has been emphasized by various policy documents. The NEP

2020 strongly advocates for the inclusion of IKS, including Ayurveda, in school and higher education. Scholars argue that such integration not only enriches learning but also fosters cultural pride and global recognition of India's intellectual traditions. However, empirical studies assessing how well these curricular references translate into student awareness remain limited, particularly at the school level.

Research on Ayurveda awareness among students indicates a general familiarity with common practices such as home remedies, herbal treatments, and yoga, but deeper cognitive understanding is often missing (Verma, 2017; Singh and Tiwari, 2020).^[6] Gender and school-type differences have also been observed, with private school students and female students often demonstrating relatively higher awareness levels (Kumar, 2018).^[7] These patterns underline the socio-cultural factors influencing knowledge acquisition beyond textbook learning.

Overall, the literature points to three critical gaps:

1. While Ayurveda is mentioned in NCERT curricula, its representation is fragmented and insufficient
2. Empirical data on student awareness at the school level, especially in urban centers like Varanasi, is scarce
3. There is a lack of studies linking curricular representation with actual student awareness, particularly in the light of NEP 2020.

The present study attempts to bridge these gaps by analyzing NCERT textbooks for Ayurveda-related content and by surveying senior secondary students in Varanasi to assess their level of awareness.

3. OBJECTIVES OF THE STUDY

The present study was undertaken with the following objectives:

1. To analyze the representation of Ayurveda in NCERT textbooks from Classes 6 to 12, with reference to themes of health, lifestyle, and traditional knowledge
2. To assess the level of awareness about Ayurveda among senior secondary students in Varanasi city
3. To examine variations in awareness across gender and school type (government and private schools)
4. To suggest pedagogical strategies for better integration of Ayurvedic knowledge into school education, in alignment with the vision of the NEP 2020.

4. METHODOLOGY

4.1. Research Design

The study employed a descriptive survey design, combining quantitative data from student questionnaires with qualitative content analysis of NCERT textbooks. This mixed approach was adopted to capture both the curricular representation of Ayurveda and the actual awareness levels of students.

4.2. Population and Sample

The population of the study consisted of senior secondary school students in Varanasi city, Uttar Pradesh. A sample of 847 students was selected through stratified random sampling to ensure representation of both government and private schools. Of the total respondents, 231 (27.3%) were from government schools and 616 (72.7%) from private schools, reflecting the proportionate distribution of students across school types in the city. Both male and female students were included in the sample.

4.3. Research Tools

Two main tools were employed:

1. Questionnaire for Students:
 - A structured questionnaire consisting of 46 items was developed
 - Items were designed to assess three dimensions: (a) general awareness of Ayurveda, (b) understanding and application of Ayurvedic principles, and (c) perceptions of Ayurveda in daily life
 - Both closed-ended (multiple-choice) and awareness-based items were included.^[8]
2. Textbook Analysis Framework:
 - NCERT textbooks from Classes 6 to 12 were analyzed to identify Ayurveda-related content
 - Content analysis focused on references to health, hygiene, diet, medicinal plants, yoga, and preventive healthcare
 - The analysis mapped the progression of Ayurvedic themes across different grade levels and subjects.

4.4. Data Collection Procedure

Data were collected in two stages:

1. Curriculum Analysis: NCERT textbooks currently prescribed across classes 6–12 were systematically reviewed
2. Student Survey: Questionnaires were administered directly to students in selected schools of Varanasi, with prior permission from school authorities. Respondents were briefed about the purpose of the study, and confidentiality of responses was ensured.

4.5. Data Analysis

- Quantitative data were analyzed using frequencies, percentages, and Chi-square tests to examine variations in awareness by gender and school type
- Textbook content was categorized thematically to highlight the presence and depth of Ayurveda-related topics
- Results from both analyses were triangulated to identify consistencies and gaps between curricular content and student awareness.

5. RESULTS

5.1. Representation of Ayurveda in NCERT Textbooks

The content analysis of NCERT textbooks from Classes 6 to 12 revealed that Ayurveda-related concepts are integrated indirectly across subjects, rather than presented as a separate discipline.

- Classes 6–8: At the middle school level, Ayurveda-related ideas appear mainly through themes of *health, hygiene, balanced diet, and medicinal plants*. For example, Class 6 Science textbooks highlight the importance of clean water, nutrition, and traditional remedies, while Social Science books make occasional references to India's medical traditions
- Classes 9–10: In high school, references expand into *lifestyle, preventive healthcare, and yoga*. Class 10 Science introduces the importance of immunity and disease prevention, with indirect connections to Ayurvedic principles
- Classes 11–12: At the senior secondary stage, the Biology curriculum contains brief references to *plant-based medicine, pharmacognosy, and indigenous medical systems*. History and Philosophy subjects also note the contributions of ancient texts such as the *Charaka Samhita* and *Sushruta Samhita*.

Overall, while Ayurveda is present in the NCERT curriculum, its representation is fragmented and often brief, without systematic progression or deeper conceptual engagement.

5.2. Awareness of Ayurveda among Students

Survey findings from 847 senior secondary students in Varanasi provided insights into their level of awareness regarding Ayurveda.

The awareness of Ayurveda among senior secondary students was assessed using descriptive statistics. The results are presented below in terms of overall awareness, gender-wise awareness, and school-type differences.

5.2.1. Overall awareness

A majority of students demonstrated basic awareness of Ayurveda, particularly regarding home remedies, herbal treatments, and the use of Ayurvedic practices in daily life. However, a deeper understanding of Ayurvedic principles (such as doshas, preventive care frameworks, or classical texts) was limited.

5.2.1.1. Interpretation

The results show that majority of the students (44.7%) fall into the *moderate awareness* category, indicating a general but not comprehensive understanding of Ayurveda. Nearly one-third (29.3%) of students demonstrated high awareness, while 26.0% exhibited low awareness [Table 1]. This suggests that while Ayurveda is a familiar concept, deeper engagement remains limited.

5.2.2. Gender-wise awareness

Analysis revealed that female students displayed relatively higher awareness levels compared to male students across most domains. The Chi-square test confirmed statistically significant differences in several items.

5.2.2.1. Interpretation

The data indicate that female students possess higher levels of awareness compared to male students. While 33.6% of females demonstrated high awareness, only 24.8% of males did so. Conversely, low awareness was more prevalent among males (29.1%) than females (23.0%) [Table 2]. The Chi-square test confirmed that these differences were statistically significant ($P < 0.05$) [Table 3].

5.2.3. School-type awareness

5.2.3.1. School-type differences

Private school students showed greater awareness compared to their government school counterparts. This suggests that socio-economic background, parental influence, and exposure to health-related resources play an important role in shaping awareness.

5.2.3.2. Interpretation

Private school students demonstrated higher levels of awareness compared to government school students. High awareness was reported among 32.8% of private school students, whereas only 19.9% of government school students achieved the same. Low awareness was more common in government schools (34.6%) compared to private schools (22.7%) [Table 4]. These findings indicate that institutional factors, including resources and exposure, play a role in shaping Ayurveda awareness.

5.2.4. Domain-wise awareness

Students were more familiar with practical aspects of Ayurveda (e.g., use of turmeric, tulsi, or yoga) than with theoretical aspects (e.g., tridosha theory, Ayurvedic classical texts). Students showed

notable differences in awareness depending on the domain of Ayurveda:

- Practical aspects: Most students were familiar with day-to-day applications, such as the use of turmeric, tulsi, herbal remedies, and yoga
- Theoretical aspects: Awareness of Ayurvedic concepts such as the tridosha theory, classical texts (Charaka Samhita, Sushruta Samhita), and detailed preventive care frameworks was comparatively low.

5.2.4.1. Interpretation

These findings indicate that while Ayurveda is widely recognized in practical, lifestyle-related contexts, students' theoretical understanding remains limited. This underscores the gap between curricular content and cognitive assimilation of Ayurvedic knowledge.

These findings indicate that while Ayurveda-related knowledge is part of the cultural environment and occasionally reinforced through the curriculum, its translation into structured awareness among students is uneven.

5.2.5. Chi-square test results

To determine whether differences in awareness of Ayurveda were statistically significant across gender and type of school, the Chi-square test of independence was applied.

5.2.5.1. Interpretation

The Chi-square analysis confirmed that both gender and type of school were significantly associated with awareness of Ayurveda. Female students had higher levels of awareness than male students, and private school students showed significantly greater awareness compared to their government school counterparts. These results highlight that demographic and institutional variables play a critical role in shaping knowledge of Ayurveda.

6. DISCUSSION

The findings of the present study highlight important insights into the integration of Ayurvedic knowledge in school education and its translation into student awareness.

6.1. Overall Awareness Levels

The study revealed that while most students possessed at least a moderate level of awareness about Ayurveda, only a smaller proportion demonstrated high awareness, and a significant segment remained in the low-awareness category. This suggests that Ayurveda is familiar as a cultural and domestic practice, but structured and in-depth understanding remains limited. These results are consistent with Verma (2017), who observed that adolescents often recognize Ayurveda in terms of common home remedies rather than as a comprehensive system of healthcare.^[9]

6.2. Gender Differences in Awareness

The Chi-square test confirmed a significant association between gender and Ayurveda awareness. Female students exhibited higher levels of awareness compared to male students. This finding resonates with earlier research (Kumar, 2018; Singh and Tiwari, 2020), which also reported that girls tend to have stronger knowledge of health-related practices. Socialization patterns may contribute to this trend, as girls are more often engaged in household health practices, including the use of herbs and dietary care. The higher awareness among females underscores the influence of family and cultural roles in shaping Ayurveda-related knowledge.

6.3. School-type Differences in Awareness

Significant differences were also found between students of government and private schools, with private school students demonstrating higher levels of awareness. This outcome may be linked to socio-economic advantages, greater exposure to extracurricular resources, and more active parental involvement often found in private school contexts. Government school students, on the other hand, may have limited access to supplementary materials beyond their textbooks. This pattern corresponds with Deshpande (2020), who noted socio-economic status as a strong determinant of indigenous health knowledge among adolescents. The results emphasize the need for equitable strategies so that Ayurveda awareness is not confined to specific socio-economic groups.

6.4. Curriculum Representation versus Student Awareness

The analysis of NCERT textbooks showed that Ayurveda-related concepts are present but fragmented and brief. While health, hygiene, and lifestyle themes are incorporated at different grade levels, they do not appear as a coherent body of knowledge. This fragmented representation may explain why student awareness remains moderate rather than high. Rao and Gupta (2018) similarly observed that Ayurveda in NCERT textbooks is often reduced to peripheral references rather than being systematically developed.^[10] The disjunction between curricular content and student awareness underscores the need for better pedagogical approaches.

6.5. Implications for NEP 2020 and Integration of Ayurveda

The findings of this study acquire special significance in the context of the NEP 2020, which emphasizes the inclusion of IKS, including Ayurveda, in education. The uneven awareness among students and the fragmented representation in textbooks highlight the challenges of achieving this vision. For meaningful integration, Ayurveda should not only appear as textbook content but also be incorporated into experiential and applied learning. Initiatives such as Ayurveda clubs, herbal gardens, workshops on traditional medicine, and teacher training can bridge the gap between curriculum and lived awareness.

6.6. Synthesis with Literature

The present study adds to existing scholarship by providing empirical evidence from Varanasi, a city historically linked with Ayurveda. The results reaffirm prior studies (Sharma, 2019; Patwardhan, 2021) on the potential of Ayurveda as a preventive health system, while also highlighting the persistent gap between curricular representation and student awareness. The gender and school-type differences observed further support earlier findings (Singh and Tiwari, 2020; Deshpande, 2020), indicating that cultural roles and socio-economic contexts significantly influence awareness levels.

7. CONCLUSION AND RECOMMENDATIONS

7.1. Conclusion

This study examined the awareness of Ayurveda among senior secondary school students in Varanasi, analyzing differences by gender and school type while also reviewing the representation of Ayurveda in NCERT textbooks. The results indicate that although Ayurveda is recognized by most students, the depth of awareness remains moderate, with only a limited proportion demonstrating high knowledge. Significant differences were observed between male and female students, with females showing comparatively higher awareness, and between government and private school students, with private school students being more aware.

The analysis of NCERT textbooks revealed that Ayurvedic concepts are present but scattered and insufficiently developed, limiting their potential to foster comprehensive awareness. These findings suggest a gap between curricular intent and student outcomes. In the broader context of NEP 2020, which prioritizes the integration of IKS, the study underscores the need for more structured and experiential inclusion of Ayurveda in school education.

Overall, the research highlights that Ayurveda, despite its historical and cultural significance, is yet to be systematically integrated into mainstream education in a way that ensures equitable awareness across genders and school types.

7.2. Recommendations

Based on the findings, the following recommendations are proposed:

1. Curriculum strengthening
 - Develop a more coherent and structured inclusion of Ayurveda in NCERT textbooks, ensuring continuity and depth from classes 6 to 12
 - Highlight both theoretical principles and practical applications, moving beyond scattered references.
2. Experiential learning approaches
 - Establish herbal gardens, Ayurveda clubs, and activity-based modules in schools to promote hands-on learning
 - Encourage projects, workshops, and case studies that connect Ayurveda with daily life practices.
3. Teacher training and resources
 - Provide training programs and resource materials for teachers to deliver Ayurveda-related content effectively
 - Incorporate Ayurveda themes in teacher education curricula to build capacity.
4. Equity in awareness
 - Special efforts should target government schools to reduce disparities in Ayurveda awareness compared to private schools
 - Use community participation, local resource persons, and digital platforms to widen access.
5. Alignment with NEP 2020
 - Link Ayurveda education initiatives with the NEP 2020 vision of promoting IKSs
 - Develop pilot projects in collaboration with NCERT, Central Council for Research in Ayurvedic Sciences, and local institutions in Varanasi as a model for nationwide adoption.

7.3. Future Research

Further studies may expand to other regions beyond Varanasi, explore longitudinal impacts of curricular integration, and evaluate the effectiveness of innovative pedagogical interventions in building deeper student engagement with Ayurveda.

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9. AUTHORS' CONTRIBUTIONS

All authors have contributed equally to conception, design, data collection, analysis, drafting, and final approval of the manuscript.

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11. ETHICAL APPROVALS

This study does not require ethical clearance as it is a literary research.

12. CONFLICTS OF INTEREST

Nil.

13. DATA AVAILABILITY

This is an original manuscript, and all data are available for only review purposes from the principal investigators.

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Table 1: Distribution of respondents by overall awareness of Ayurveda

Awareness level	Frequency (n)	Percentage
High awareness	248	29.3
Moderate awareness	379	44.7
Low awareness	220	26.0
Total	847	100.0

Table 2: Gender-wise distribution of awareness of Ayurveda

Awareness level	Male (n=412)	%	Female (n=435)	%	Total (n=847)	%
High Awareness	102	24.8	146	33.6	248	29.3
Moderate Awareness	190	46.1	189	43.4	379	44.7
Low Awareness	120	29.1	100	23.0	220	26.0
Total	412	100.0	435	100.0	847	100.0

Table 3: Chi-square test of association for awareness of Ayurveda

Variable	Chi-square value	Df	P-value	Significance
Gender×awareness level	9.62	2	0.008	Significant ($P<0.05$)
School type×awareness level	14.85	2	0.001	Significant ($P<0.01$)

Table 4: Awareness of Ayurveda by type of school

Awareness level	Government (n=231)	%	Private (n=616)	%	Total (n=847)	%
High awareness	46	19.9	202	32.8	248	29.3
Moderate awareness	105	45.5	274	44.5	379	44.7
Low awareness	80	34.6	140	22.7	220	26.0
Total	231	100.0	616	100.0	847	100.0