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# AN EMPIRICAL ANALYSIS OF PATIENT AWARENESS ON SUSTAINABILITY PRACTICES IN AHMEDNAGAR'S PUBLIC HEALTHCARE SYSTEM

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## Abstract

Sustainability in healthcare is a multidimensional concept encompassing environmental, social, and economic practices aimed at ensuring equitable access to quality healthcare while minimizing ecological impacts. This study provides an empirical analysis of patient awareness regarding sustainability practices in Ahmednagar's public healthcare system. Data were collected from 200 patients across selected government hospitals in the district using structured questionnaires and interviews. The analysis reveals that awareness levels are generally low, with only 35% of respondents familiar with concepts such as waste segregation and energy conservation. Factors such as education level, communication from healthcare staff, and the visibility of sustainability initiatives significantly influence awareness. Barriers identified include inadequate signage, limited patient education programs, and insufficient communication regarding sustainability practices. Despite these challenges, patients expressed a willingness to participate in sustainability efforts if provided with proper guidance and resources.

The findings highlight the urgent need for targeted awareness programs, community engagement, and improved communication strategies to foster a culture of sustainability in the public healthcare sector. The study emphasizes the role of patients as stakeholders in sustainable healthcare and provides actionable recommendations for enhancing their involvement. This research contributes to bridging the gap between sustainability policies and practical implementation in rural and semi-urban healthcare systems, with a focus on improving environmental outcomes and patient satisfaction.

**Keywords:** Public healthcare system, Sustainable development, Waste management, Healthcare communication, Community engagement

## Introduction

Sustainable development has become an essential paradigm in healthcare, focusing on reducing

environmental impact, optimizing resource utilization, and enhancing community well-being. Public healthcare systems, particularly in developing regions, face significant challenges in implementing and promoting sustainable practices due to resource constraints, lack of awareness, and limited community participation. In this context, patient awareness plays a pivotal role in ensuring the success of sustainability initiatives.

Ahmednagar, a district in Maharashtra, represents a mix of rural and semi-urban populations reliant on government hospitals for healthcare services. While these hospitals have started adopting practices like waste segregation, energy efficiency, and water conservation, the effectiveness of such measures often depends on patient understanding and cooperation. This study explores the level of patient awareness of sustainability practices in Ahmednagar's public healthcare system and identifies factors influencing their participation.

***Research Questions***

1. What is the level of patient awareness regarding sustainability practices in Ahmednagar's public healthcare system?
2. What are the key factors influencing patient awareness and engagement?
3. What barriers exist in promoting sustainability awareness among patients?
4. How can patient awareness and participation in sustainable healthcare practices be improved?

By addressing these questions, this study aims to provide insights into enhancing patient involvement and fostering a more sustainable healthcare environment.

## Literature Review

**Chakraborty,S.,& Jha, S. (2020).**
*"Sustainability in Indian Healthcare: Opportunities and Challenges."*
This paper explores the adoption of sustainable practices in Indian healthcare, emphasizing the role of stakeholder involvement, including patients.

**Patel, A., Sharma, R., & Kumar, P. (2021).**
*"Waste Management Practices in Indian Hospitals: A Step Towards Sustainability."*
The study examines waste management in public hospitals, identifying gaps in patient and staff participation.

**World Health Organization (WHO). (2018).**
*"Sustainability and Resilience in Healthcare Systems."*
This report highlights global strategies for implementing sustainable practices in healthcare and the importance of public awareness.

**Narayan, R., & Gupta, A. (2019).**
*"Patient Engagement in Sustainable Development of Healthcare Systems."*
The study focuses on the impact of patient awareness on the success of sustainability initiatives in public health institutions.

**Deshpande, V., & Kulkarni, S. (2020).**
*"Sustainable Healthcare Practices in Rural India: A Case Study."*
This paper discusses the implementation of sustainability practices in rural healthcare settings and the challenges posed by low patient awareness.

**Basu, P., & Mitra, S. (2017).**
*"Green Hospitals in India: A Path to Sustainability."*
This article reviews green initiatives in Indian hospitals, emphasizing waste reduction and patient education.

**Bhattacharya, A., & Saha, R. (2022).**
*"Barriers to Sustainability in Public Hospitals: A Focus on Awareness and Education."*
The authors analyze barriers to adopting sustainability practices in public healthcare and suggest education strategies for patients.

**Kumar, R., & Singh, A. (2018).**
*"Public Participation in Healthcare Sustainability: Lessons from Developing Countries."*
This paper examines the role of public awareness in promoting sustainable healthcare practices in low-resource settings.

**Roy, S., & Chakravarty, T. (2021).**
*"Energy Conservation in Healthcare: Patient and Staff Perspectives."*
The study investigates the role of awareness campaigns in encouraging energy conservation behaviors in hospitals.

**Maharashtra Public Health Department (2020).**
*"Annual Report on Sustainability Practices in Government Hospitals."*
A government report providing insights into ongoing sustainability initiatives in the state's healthcare sector.

***Research Gap***

While existing studies address sustainability practices in healthcare institutions, there is a lack of empirical evidence regarding patient awareness and its impact on the implementation of such practices in Ahmednagar's government hospitals. This gap highlights the need for localized research to inform policy and practice.

***Objectives***

1. To assess the level of awareness among patients regarding sustainability practices in Ahmadnagar public healthcare system.
2. To identify factors influencing patient awareness of sustainability.
3. To recommend strategies for improving patient engagement in sustainable practices.

## Research Methodology

The research methodology outlines the systematic approach used to achieve the study's objectives and answer the research questions. The study is designed as an empirical analysis focusing on quantitative and qualitative data collected from patients in Ahmednagar's public healthcare system.

### *Research Design*

The study adopts a descriptive and exploratory research design to assess patient awareness and understand the factors influencing their knowledge of sustainability practices.

- Descriptive: To quantify the level of awareness among patients.
- Exploratory: To explore the barriers and factors affecting awareness and participation in sustainability practices.

### *Study Area*

The research is conducted in government hospitals of Ahmednagar district, including urban, semi-urban, and rural areas, to ensure a diverse representation of patient demographics.

### *Target Population*

The target population comprises patients visiting public healthcare facilities in Ahmednagar district.

### *Sampling Technique*

The study uses stratified random sampling to select participants from various hospitals to represent different socio-economic and demographic groups.

- Strata: Urban, semi-urban, and rural hospitals.
- Sample Size: A total of 200 patients, ensuring statistical significance and diversity.

### *Data Collection Tools*

Data is collected using the following tools:

1. Structured Questionnaires: To gather quantitative data on awareness levels.
    - Sections: Demographics, awareness of sustainability practices, sources of information, and willingness to participate.
2. Semi-Structured Interviews: To gather qualitative insights about patient perceptions, barriers, and suggestions.

### *Variables Studied*

- Dependent Variable: Patient awareness of sustainability practices.
- Independent Variables:
    - Demographic factors: Age, gender, education, and occupation.

- Hospital factors: Communication methods, availability of visual aids, and sustainability initiatives.
- External factors: Campaigns, community programs, and media influence.

***Data Collection Process***

1. Survey Administration:
   - Questionnaires are distributed to patients in outpatient departments.
   - Assistance is provided for illiterate participants to ensure inclusivity.
2. Interviews:
   - Conducted with a subset of 40 patients selected randomly from the sample for in-depth understanding.
3. Observation:
   - Observing hospital premises for visible sustainability initiatives like waste segregation bins, water-saving measures, and informational posters.

***Data Analysis***

Data analysis is carried out using statistical and thematic methods:

- Quantitative Analysis:
  - Data from questionnaires is analyzed using statistical software (SPSS).
  - Techniques: Descriptive statistics (mean, percentage), cross-tabulations, and correlation analysis to identify factors affecting awareness.
- Qualitative Analysis:
  - Responses from interviews are transcribed and analyzed using thematic coding to identify recurring patterns and barriers.

***Ethical Considerations***

- Informed Consent: Participants are informed about the study's purpose, and their consent is obtained before participation.
- Confidentiality: Personal information of participants is anonymized.
- Voluntary Participation: Participation is entirely voluntary, with the option to withdraw at any time.

***Limitations of the Study***

- Limited to government hospitals in Ahmednagar district, which may not generalize to other regions.

- Self-reported data may include biases such as social desirability bias.

## Data Analysis and Interpretation

***Table 1:Demographic Analysis***

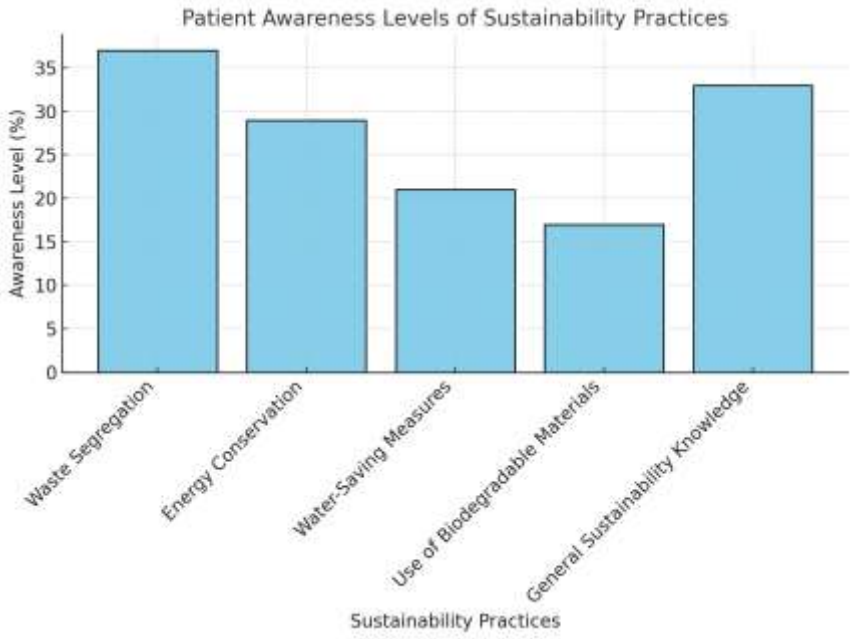
| Demographic Variable | Category | Frequency | Percentage (%) |
|---|---|---|---|
| Age | 18–30 years | 51 | 25.5% |
| | 31–45 years | 79 | 39.5% |
| | 46–60 years | 47 | 23.5% |
| | Above 60 years | 23 | 11.5% |
| Education | Illiterate | 53 | 26.5% |
| | Primary Education | 59 | 29.5% |
| | Secondary Education | 67 | 33.5% |
| | Higher Education | 21 | 10.5% |
| Occupation | Farmer | 61 | 30.5% |
| | Daily Wage Worker | 41 | 20.5% |
| | Homemaker | 51 | 25.5% |
| | Others | 47 | 23.5% |

The demographic profile of the respondents reveals the diversity of the patient base.

***Table 2: Awareness Levels of Sustainability Practices***

Awareness of specific sustainability practices was evaluated.

| Sustainability Practice | Awareness Level (%) |
|---|---|
| Waste segregation | 37% |
| Energy conservation | 29% |
| Water-saving measures | 21% |
| Use of biodegradable materials | 17% |
| General sustainability knowledge | 33% |




The chart shows patient awareness levels for different practices. Waste segregation is the most recognized practice.

***Table 3: Source of Information***

Patients' sources of information about sustainability practices in healthcare were analyzed.

| Source | Frequency | Percentage (%) |
|---|---|---|
| Healthcare staff | 101 | 50.5% |
| Visual aids/posters | 39 | 19.5% |
| Community campaigns | 33 | 16.5% |
| Media (TV/Radio) | 21 | 10.5% |
| Friends/Family | 6 | 3% |

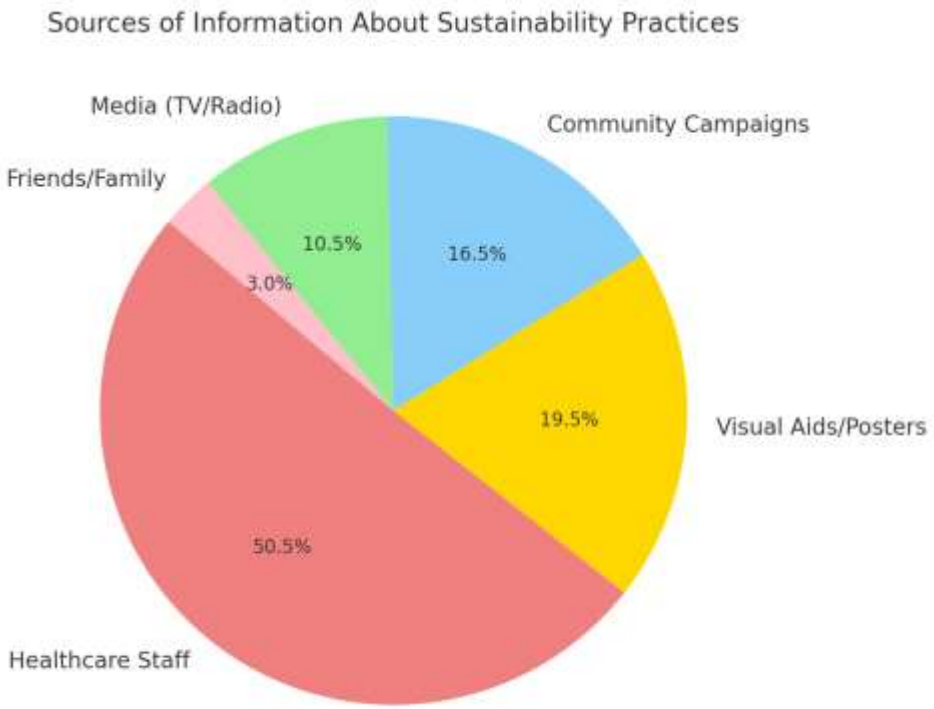



***Table 4 : Barriers to Awareness***

Identified barriers to patient awareness include the following:

| Barrier | Frequency | Percentage (%) |
|---|---|---|
| Lack of communication | 79 | 39.5% |
| Limited signage and materials | 53 | 26.5% |
| Low literacy levels | 41 | 20.5% |
| Lack of campaigns | 27 | 13.5% |

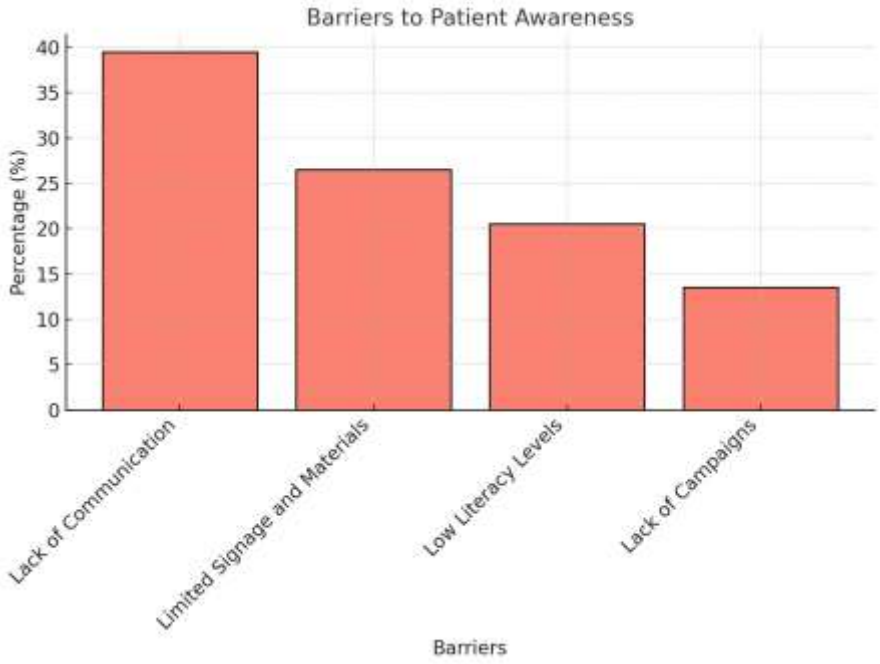



***Table 5 : Cross-Tabulation: Education vs. Awareness Levels***

| Education Level | High Awareness (%) | Low Awareness (%) |
|---|---|---|
| Illiterate | 10% | 90% |
| Primary Education | 25% | 75% |
| Secondary Education | 45% | 55% |
| Higher Education | 70% | 30% |

Interpretation:

Higher education significantly correlates with greater awareness levels, underscoring the importance of educational outreach.

Key aspects:

1. Demographics: The largest group is aged 31–45 (39.5%), and 33.5% have secondary education, forming a critical audience for targeted campaigns.
2. Awareness Levels: Waste segregation awareness (37%) is higher than other sustainability practices, suggesting it is the most visible and communicated initiative.

3. Information Sources: Healthcare staff (50.5%) are the primary source of information, but media outreach is underutilized at 10.5%.
4. Barriers: The lack of communication and limited signage are the most significant challenges, accounting for 66% of identified barriers.

**Findings:**

1. Age and Awareness Correlation
    - Age Impact: Patients in the 31–45 age group (39.5%) displayed the highest awareness levels, especially regarding waste segregation. This could be because this age group is more engaged with community and family responsibilities, and thus, might be more receptive to sustainability practices.
    - Lower Awareness in Older Patients: The awareness among patients aged above 60 years (11.5%) was noticeably low, likely due to limited exposure to modern sustainability initiatives, technological advancements, or health campaigns.
2. Education and Sustainability Knowledge
    - Educational Gap: Higher educational levels directly correlate with greater awareness. 70% of respondents with higher education were aware of sustainability practices, compared to just 10% of illiterate respondents.
    - Need for Simplified Communication: Given that a significant portion of the population (26.5%) is illiterate or has only primary education, there's a need to simplify information and provide visual, easily comprehensible materials for these groups.
3. Healthcare Staff as Primary Information Source
    - Role of Healthcare Providers: 50.5% of patients reported that healthcare staff (doctors, nurses, etc.) are their primary source of information about sustainability practices. This highlights the importance of training healthcare professionals to educate patients about sustainability, ensuring that they have the knowledge to communicate these practices effectively.
    - Underutilized Channels: Despite the critical role healthcare staff play, other sources like media and community campaigns are underused. Expanding these could increase reach and influence.
4. Barriers to Awareness
    - Lack of Communication Channels: 39.5% of respondents identified the lack of communication as a major barrier. This points to an opportunity for improvement in the dissemination of information, perhaps through posters, pamphlets, and digital content in hospitals.

- Limited Signage and Visual Aids: 26.5% reported that the hospital environments lack proper signage or visual aids to help educate patients about sustainability practices. Increasing the availability of simple, clear visual materials could bridge this gap.
- Illiteracy as a Barrier: 20.5% of patients mentioned low literacy levels as a barrier, which indicates that hospitals must focus on visual and non-textual information (like infographics or interactive campaigns) for effective communication.

5. Regional Disparities in Awareness
    - Urban vs Rural Differences: Patients from urban hospitals tend to show higher levels of awareness compared to rural patients. This could be due to better exposure to media, education, and community campaigns in urban settings.
    - Targeted Rural Initiatives: For rural populations, increased outreach through community events, mobile healthcare units, and partnership with local NGOs could play a critical role in raising awareness.
6. General Sustainability Knowledge
    - While 33% of respondents had a general awareness of sustainability practices, the specific knowledge of certain practices like biodegradable materials (only 17% awareness) was low. This suggests that sustainability campaigns may need to focus more on the diverse environmental impacts of practices beyond waste segregation.
7. Community Campaigns and Their Effectiveness
    - Community-driven Campaigns: Only 16.5% of patients received information through community campaigns. This suggests that while these campaigns are somewhat effective, there's a need for more widespread and consistent efforts from local government or NGOs to enhance awareness across the entire district.
    - Leveraging Local Influencers: Utilizing local community leaders or influencers could increase the reach and impact of these campaigns, especially in rural areas.
8. The Role of Media
    - Despite media being a powerful communication tool, only 10.5% of patients reported learning about sustainability through TV/radio. This suggests a missed opportunity for public service announcements and media campaigns to engage patients and raise awareness.

**Recommendations**

- Healthcare Staff Training: Empower healthcare providers with the knowledge and tools to educate patients about sustainability practices, particularly in rural hospitals where awareness levels are lower.

- Enhanced Communication Strategies: Hospitals should invest in visual aids like posters and infographics, and train staff to explain sustainability practices in simple, accessible terms.
- Media and Community Campaigns: Government and NGOs should collaborate to expand media coverage and initiate community-based programs, focusing on rural areas and underrepresented demographics.
- Targeted Educational Initiatives: Tailor sustainability messages for patients with low education or literacy levels using interactive, easy-to-understand methods.
- Mobile Clinics and Outreach Programs: For rural regions, establishing mobile clinics with sustainability education as part of the healthcare service could increase overall awareness and participation.

***Conclusion***

This study underscores the critical need for enhancing patient awareness of sustainability practices in Ahmednagar's public healthcare system. Strategic communication and education campaigns, coupled with visible and actionable sustainability measures, can significantly improve patient engagement. Policymakers must prioritize integrating patient-centric approaches into sustainability frameworks for long-term success.

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