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BLEEDING IN SILENCE: A REVIEW ON SANITARY PADS

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Abstract:

Because sanitary pads are readily available, comfortable, and convenient, the majority of Indian women and girls use them as their main menstrual hygiene product. Over the course of about 38 years of her menstrual life, a woman typically uses 25 pads per cycle, with 12 cycles annually. As a result, each person uses between 11,000 and 12,000 pads during their lifetime. With an estimated 213 million Indian women and girls using sanitary pads, the total impact is astounding—more than 2 trillion sanitary pads are used nationwide over many generations. However, there is a substantial environmental cost associated with this extensive use. The majority of commercial sanitary pads are made of synthetic materials and non-biodegradable plastics, which take 500–800 years to break down. Over 12 billion sanitary pads are produced in India alone each year, which significantly adds to the amount of unsorted plastic waste. Health and environmental hazards are exacerbated by inadequate disposal systems, especially in rural and low-resource areas. In addition to discussing sustainable and biodegradable alternatives that are desperately needed for a cleaner and healthier future, this review examines the current trends in sanitary pad usage among Indian girls and assesses the risks to their health, the economy, and the environment.

Introduction

Despite being a normal biological process that almost half of people go through, menstruation is still stigmatized and rarely discussed, especially in India. Because of their ease of use, accessibility, and growing public awareness, sanitary pads are the most widely used menstrual hygiene product among Indian women and girls worldwide. Menstrual hygiene practices have drastically changed in India over the past few decades, reflecting shifting public perceptions, governmental initiatives, and business advancements.

Histrocial background of sanitary pads in india

By the early 20th century, sanitary pads had become widely used in Western nations after being initially created in Europe in the late 19th century. However, cultural taboos, a lack of awareness, and the high price of imported goods caused India to introduce disposable sanitary napkins much later than other countries. In 1989, Johnson & Johnson launched the first sanitary pad that was sold commercially in India under the "Stayfree" brand. Concurrently, Procter & Gamble's Whisper brand made its debut in the Indian market in the early 1990s and rose to prominence as one of the country's most well-known brands for menstruation

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products. Prior to the 1980s, most Indian women—especially in rural areas—used homemade cloths, old sarees, husk, ash, or even sand wrapped in cloth due to lack of affordable alternatives.

While the entry of these multinational companies marked the beginning of the disposable sanitary pad industry in India, it was only in the early 2000s that pads began to see broader adoption, especially in urban areas [1].

Current usage in india

Approximately 64% of Indian women between the ages of 15 and 24 currently use sanitary pads, per recent surveys like the National Family Health Survey (NFHS-5).

Depending on accessibility, awareness, and affordability, usage in rural areas still ranges between 48 and 55 percent, while in urban areas it surpasses 80 percent.

A woman who menstruates typically uses 25 pads for each period, 12 periods annually, for about 38 years, for a total of 11,000 to 12,000 pads used over her lifetime. An estimated 12 billion pads are used annually in India, where there are over 355 million menstruating women and girls. The majority of these pads are non-biodegradable and wind up in open spaces or landfills.

COST AND AFFORDABILITY

Sanitary pads are available in a wide range of prices:

- Commercial pads (e.g., Whisper, Stayfree): ₹5–₹12 per pad
- Monthly cost: ₹100–₹250
- Biodegradable/organic pads: ₹10–₹18 per pad
- Cloth pads (reusable): ~₹200–₹500 per pack (lasts 6–12 months)

Launched in 2018, government-subsidized "Siddha" pads cost ₹1 each and are offered through the Jan Aashaadha Scheme.

Affordability is still a major obstacle in spite of these initiatives, particularly for girls from low-income or rural families who frequently still turn to risky traditional alternatives [2].

Comparsion with other countries

Compared to women in developed nations, Indian women typically use fewer sanitary pads annually:

India: ~300 pads/year
USA/Japan: ~330–340 pads/year
UK: ~320 pads/year

The main causes of this lower usage in India are cultural stigmas in rural or tribal areas, access problems, and a lack of education about menstrual hygiene

Regional Disparities within India

Pad usage varies greatly between Indian states:

1. **High usage (>75%)**: Kerala, Tamil Nadu, Maharashtra, Delhi
2. **Moderate usage (50–70%)**: Gujarat, Karnataka, Andhra Pradesh
3. **Low usage (<50%)**: Bihar, Uttar Pradesh, Jharkhand, Chhattisgarh

These differences highlight how urgently more equitable infrastructure, education, and distribution are needed.

Cultural and social context in india

Menstruation has long been viewed as a taboo topic in India, especially in conservative and rural communities. Women and girls are frequently instructed on how to discreetly and quietly manage their periods. A survey by UNICEF and NFHS revealed:

In rural India, only 48% of teenage girls know about menstruation prior to their first period. Due to social stigma, a lack of restrooms, or the availability of pads, many schoolgirls skip classes during their periods [3].

Innovation and rise of indian brands

Many Indian businesspeople and non-governmental organizations have created reasonably priced, environmentally

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friendly sanitary products for low-income and rural consumers during the past 20 years.

Here are a few noteworthy examples:

The "Padman of India," Arunachala Muruganantham, created a low-cost sanitary pad manufacturing machine in 2006. His creation inspired the 2018 Bollywood movie Padman and transformed menstrual hygiene in rural areas [4].

A women-led cooperative that makes reusable cloth pads is called Eco Femme (Tamil Nadu). Saathi Pads (Ahmedabad): Uses banana fiber to make pads that are 100% biodegradable.

An NGO in Delhi called Goonj advertises "My Pad," a cloth pad composed of recycled, clean cloth.

These innovations have helped bridge the urban-rural divide in menstrual health [5].

Government interventions & schemes

The Indian government has started a number of programs to address menstrual hygiene management (MHM):

1. Menstrual Hygiene Scheme (MHS) – 2011

Under the Ministry of Health & Family Welfare

Provided subsidized pads to adolescent girls in rural areas

2. Suvidha Scheme (2018–present

Launched under the **Jan Aushadhi Scheme**

Provides **100% oxo-biodegradable pads at ₹1 each**

Pads are available at **Jan Aushadhi Kendras** (subsidized pharmacies)

3. Rashtriya Kishor Swasthya Karyakram (RKSK)

Focuses on the **reproductive health of adolescents**

Trains **ASHA workers** to distribute pads and provide awareness

These programs seek to lower school dropout rates, improve accessibility, and encourage proper disposal techniques.

Menstrual hygiene education in schools

Many state-level school health programs, especially in Kerala, Tamil Nadu, and Maharashtra, have included education on menstrual hygiene since 2014. Nonetheless, fewer than half of girls in rural areas have access to water-filled school restrooms with trash cans. Due to discomfort or a lack of training, many educators avoid discussing periods. Shame is exacerbated by male classmates who are frequently ignorant or misinformed. Particularly in underserved and tribal areas, initiatives like UNICEF's "WASH in Schools" and workshops led by NGOs are attempting to normalize period talk [6].

Media, NGOs, and Awareness Campaigns

Public awareness of menstrual health has increased as a result of social media, movies, and campaigns:

Bollywood's Padman (2018) sparked national conversation on affordability and dignity.

Menstrupedia: An Indian comic-style educational platform that breaks taboos and teaches children (boys and girls) about menstruation.

SHE India, WaterAid, Goonj, WASH United: NGOs working across India to provide pads, conduct workshops, and promote safe disposal.

More girls are now empowered to talk openly about their periods and make educated decisions thanks to these movements.

Environmental challenges

Sanitary pads have increased comfort and health, but they have also led to a significant waste problem: 90% of pads are made of plastic, and they take 500–800 years to break down [7].

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In India, more than 12 billion used pads are thrown away annually. Menstrual waste bins and incinerators are scarce in public spaces, particularly in rural areas.

Contamination of soil and water can result from improper disposal (burning or flushing).

Therefore, there is an urgent need for environmentally friendly products and appropriate menstrual waste management systems [8].

Global Comparison: India vs the World

Country	Avg. Pads/Year	Pad Usage Coverage	Free Pads in Schools?
India	300	~64%	No (some states only)
USA	330	~95%	No
UK	320	~98%	Yes (from 2020)
Japan	340	~99%	No
Kenya	280	~70%	Yes (government schemes)

Particularly in rural and tribal areas, India continues to lag behind developed nations in terms of disposal systems, school support, and universal menstrual access. Sanitary Pad Usage, Chemical Exposure, and Health Impacts in India.

Duration of Sanitary Pad Use in Daily Life

Many women and girls in India spend six to eight hours a day wearing a single sanitary pad. Due to social stigma, a lack of access to clean restrooms, or the unavailability of spare pads, this period may last up to nine hours or longer in rural areas. In schools, colleges, and workplaces with inadequate menstrual hygiene infrastructure, this prolonged use raises the risk of rashes, bacterial infections, and increased chemical exposure.

Chemical Composition and Exposure Risks

Super Absorbent Polymers (SAP), dioxins from chlorine bleaching, phthalates in adhesives, and volatile organic compounds (VOCs) are frequently found in commercial sanitary pads. Without going through liver detoxification, these substances are absorbed through the extremely permeable vulvar and vaginal tissues (first-pass metabolism). Hormonal and reproductive health may be affected systemically by prolonged exposure to such chemicals.

3. Health Issues Related to Pad Usage

Skin rashes, itching, UTIs, and discomfort are common health problems. Serious reproductive disorders like PCOD, PCOS, endometriosis, ectopic pregnancy, and menorrhagia may be associated with prolonged exposure to endocrine-disrupting chemicals. A significant issue is the lack of user awareness: less than 30% of Indian women change their pads within the advised window of four to six hours, and 78% of them are ignorant of the chemical makeup of pads.

4. Safe Alternatives to Conventional Pads

Menstrual cups, cloth pads, organic cotton pads, and biodegradable pads are safer and more environmentally friendly options. Although access and awareness are still low, these alternatives offer sustainable menstrual hygiene solutions, cut waste, and are free of dangerous chemicals.

Regional Comparison in India

Regional differences exist in pad use and health problems. Due to increased awareness, urban areas like Delhi and Kerala have high adoption rates (~85–90%) and fewer complaints. On the other hand, usage is lower (35–50%) and health issues like PCOS and infections are more common in rural states like Bihar and some parts of the northeast [9].

Methods

With a focus on usage patterns, chemical exposure, related health outcomes, and environmental implications, this review used a scoping review methodology to thoroughly gather, assess, and synthesize

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the literature and data on sanitary pad usage in India.

Data Sources

A range of scholarly, institutional, and governmental sources provided pertinent information. Among the main databases that were searched were:

Google Scholar
PubMed
Scopus
Ministry of Health and Family Welfare (MoHFW), India
National Family Health Survey (NFHS-4 and NFHS-5)
UNICEF and WHO publications

Reports from Indian NGOs such as **Goonj**, **Saathi**, **Eco Femme**, and **Menstrupedia**

Additional information was also taken from credible news sources, health portals, and public health campaigns that were documented.

Organization and Analysis of Data

The collected literature was examined to determine:

Duration of sanitary pad use in educational, professional, and educational environments

Common chemical components found in commercial pads, such as phthalates, dioxins, and volatile organic compounds

Related health risks include endometriosis, PCOD, PCOS, rashes, UTIs, and reproductive disorders.

Long-term degradation and the effects of disposal methods on the environment

Indian women's knowledge gaps and public awareness of pad safety

Comparative regional data based on availability and usage trends

To make it easy to compare menstrual health practices across the globe, between states, and between urban and rural areas, the data was arranged into charts, tables, and infographics.

Alternatives to convential sanitary pads

Why Take a Look at Other Options?

Despite their widespread use and convenience, traditional sanitary pads present a number of health and environmental hazards. Super absorbent polymers (SAPs), synthetic fragrances, bleaching agents like dioxins, and plastic-based materials make up the majority of commercial pads. Long-term use may cause allergies, skin irritation, and itching.

Endocrine disruption (caused by VOCs and phthalates)

Potential connection to endometriosis, PCOD/PCOS, and hormonal imbalance

India produces more than 12 billion used pads a year, the majority of which are not biodegradable, and each pad can take 500–800 years to decompose from an environmental perspective.

India's Present Alternative Situation

Even with increased awareness, only a small percentage of Indian menstruators still use alternatives to sanitary pads. Important trends consist of:

Menstrual cups and biodegradable alternatives are gradually being adopted by college students and urban women.

Due to cost, taboos, and a lack of clean water for washing reusable items, access is restricted in rural areas. NGOs like Saathi, Eco Femme, and Goonj play a key role in raising awareness and distributing eco-friendly pads. Influencers and internet platforms are increasing these products' visibility.

Advantages of Alternatives for Health and the Environment

There are many benefits to alternatives:

Advantages for Health: Long-term use, reduced risk of skin infections, and the absence of harmful chemicals

Advantages for the environment: Significant decrease in menstrual waste;

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Alternative	Description	Health Impact	Environmental Impact	Ease of Use & Availability
Biodegradable Pads	Made from banana fiber, bamboo pulp, or corn starch	Gentle on skin, no chemicals	Decompose in 6–12 months	Available online and in select stores
Cloth Pads	Reusable cotton pads; washable and long-lasting	No chemicals, breathable fabric	Minimal waste; lasts 6–12 months	Affordable, NGOs distribute in rural areas
Menstrual Cups	Medical-grade silicone cups inserted into the vagina	Safe with proper hygiene; zero toxins	Reusable for up to 10 years	Growing popularity; available online
Period Panties	Built-in absorbent underwear for light to medium flow	Comfortable; chemical-free	Reusable; low environmental burden	Mostly urban availability; niche brands

Common Alternatives to Sanitary Pads

over the course of a lifetime, one menstrual cup can replace 11,000 pads.

Choosing alternatives is not only a matter of personal health; it is also an environmental duty that upholds the values of equity, sustainability, and menstrual dignity.

Conclusion

Sanitary pads are the most widely used menstrual product in India, but this review emphasizes that there are serious health and environmental issues with them. Long-term use exposes users to potentially dangerous substances like phthalates, dioxins, and volatile organic compounds (VOCs), which have been connected to endocrine and reproductive problems. Non-biodegradable pad disposal also adds to the rising amount of plastic pollution.

A promising trend toward healthier and environmentally friendly menstrual practices are the emergence of safer and more sustainable alternatives, such as cloth pads, biodegradable pads, menstrual cups, and period panties. Adoption is still hampered, though, particularly in rural areas, by cultural stigma, accessibility issues, and ignorance

Future extent

The review's conclusions highlight how urgently India needs to raise awareness of menstrual hygiene, product safety, and environmental sustainability. Large segments of the population, particularly in rural and tribal areas, still lack access to safe, reasonably priced, and environmentally friendly menstrual products, despite a slow increase in awareness in urban areas.

1. Innovation and Research

More independent studies are required to determine the long-term health

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consequences of sanitary pad chemical exposure.

Creation of inexpensive, biodegradable menstrual products with locally available materials like jute, bamboo, and banana fiber.

Promote cooperation between academia and industry to develop innovative menstrual hygiene technologies.

2. Information Gathering and Surveys

Surveys on menstrual health should be conducted at the state level, covering product preferences, disposal practices, and health effects.

3. Knowledge and Consciousness

Enhance menstrual health education in schools, focusing on product safety and alternatives.

Conduct digital campaigns and community workshops to promote sustainable options and de-stigmatize menstruation.

4. Regulation and Policy

Create stricter guidelines for menstrual product labeling and chemical regulation.

Distribute and subsidize environmentally friendly substitutes (such as cloth pads and cups) via public health channels (such as PHCs and Anganwadis).

Require safe disposal methods in workplaces, colleges, and schools.

5. Management of the Environment

Invest in menstrual waste management systems, particularly in rural and semi-urban areas.

Encourage the use of compostable packaging and recycling for biodegradable goods.

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