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Gender disparity in education and its impact on women empowerment in India

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Abstract
This study examines gender disparity in education in India from 2015 to 2024 and its broader impact on women's empowerment. Over the past decade, notable progress has been achieved through targeted government initiatives such as *Beti Bachao, Beti Padhao*, Samagra Shiksha, and digital learning schemes, which have significantly improved girls' access to education. Girls' Gross Enrollment Ratio (GER) in secondary education has risen from 77.1% to 81.4%, accompanied by a reduction in dropout rates from 17.8% to 12.3%. Female literacy levels and the proportion of women attaining 10 or more years of schooling have also shown consistent growth, reflecting narrowing gender gaps in educational attainment. Moreover, the expansion of digital infrastructure and programs under the Digital India mission have facilitated a sharp rise in women's access to online resources, enhancing digital literacy and widening participation in knowledge economies. Alongside educational gains, indicators of empowerment such as women's participation in household decision-making, political representation at the local level, and awareness of health and financial rights have registered improvements. However, the Female Labor Force Participation Rate (FLFPR) has remained relatively stagnant, highlighting persistent structural and cultural barriers that prevent education from fully translating into economic empowerment. The COVID-19 pandemic temporarily reversed some of these gains by disproportionately affecting girls' education and access to technology, especially in rural areas, though recent recovery efforts, including gender-sensitive digital learning initiatives, have begun to mitigate these effects. This research underscores that while access to education has significantly improved, deeper socio-cultural norms, economic constraints, and limited labor market integration continue to restrict women's full empowerment. A multi-pronged approach-strengthening skill development, ensuring safe mobility, addressing gender norms, and expanding opportunities in emerging sectors-is imperative for translating educational progress into sustainable gender equity and women's socio-economic empowerment in India.

Keywords: Gender disparity, women's empowerment, girls' gross enrollment ratio, female labor force participation rate, comprehensive policy interventions

Introduction
Gender disparity in education continues to be a significant social challenge in India, directly influencing the broader goal of women empowerment. While the country has made notable progress in improving female literacy and enrollment rates over the past decade, systemic inequalities, socio-cultural barriers, and economic disadvantages continue to restrict women's access to equitable education. Education is not only a fundamental human right but also a critical driver of social transformation and economic development, and gender inequalities in this sphere limit India's ability to harness the potential of half its population. Between 2015 and 2024, various government initiatives-such as Beti Bachao, Beti Padhao, the Samagra Shiksha Abhiyan, Kasturba Gandhi Balika Vidyalaya (KGBV), and targeted scholarship schemes-have aimed to enhance female enrollment and retention in schools and higher education. These interventions have shown measurable results. For instance, the Gross Enrollment Ratio (GER) for girls in secondary education increased from 77.1% in 2015-16 to 81.4% in 2021-22 (MHRD, 2022). Similarly, the Unified District Information System for Education Plus (UDISE+ 2022-23) reported further improvements, with gender parity index (GPI) in secondary education nearing 1.05, indicating progress toward closing the gap. However, challenges such as school dropouts due to early marriage, menstrual health issues,

safety concerns, lack of infrastructure, and persistent gender stereotypes remain particularly pronounced in rural, tribal, and marginalized communities (UNESCO, 2023).

Gender disparity in education not only hinders individual growth but also impedes national development. Educated women are more likely to participate in the labor force, have fewer and healthier children, and contribute significantly to household and community well-being. According to the National Family Health Survey-5 (NFHS-5), women with higher levels of education are more empowered to make decisions about their health, finances, and family planning. Moreover, studies demonstrate that educated women are better equipped to resist domestic violence, delay marriage, and demand equal rights (UN Women, 2021). The World Bank (2023) emphasizes that reducing gender inequality in education could increase India's GDP growth potential by over 1 percentage point annually, underscoring its macroeconomic significance. The COVID-19 pandemic, however, created new setbacks. Between 2020 and 2021, prolonged school closures disrupted the education of millions of girls, particularly in disadvantaged regions. Many were pushed into early marriage, domestic responsibilities, or child labor, reversing years of progress. The Annual Status of Education Report (ASER 2021 and 2022) highlighted that girls in rural India faced disproportionate challenges in accessing digital learning resources, with limited smartphone availability and gendered restrictions on technology use widening the digital divide. Although hybrid and digital learning initiatives have expanded since 2022, gendered barriers in digital literacy and affordability continue to restrict girls' participation.

Looking forward, empowering women through education is essential to achieving the United Nations Sustainable Development Goal 5 (Gender Equality) and interconnected goals such as SDG 4 (Quality Education) and SDG 8 (Decent Work and Economic Growth). For India to reach its full developmental potential, policies must not only expand access but also address structural inequities in curriculum design, gender-sensitive pedagogy, safe school environments, and representation of women in science, technology, engineering, and mathematics (STEM). Encouragingly, the National Education Policy 2020 places emphasis on equity, inclusion, and flexibility, offering an opportunity to reshape India's educational landscape for girls and young women. Bridging the gender education gap is not merely about numbers-it is about transforming education into a tool of empowerment that enhances women's autonomy, agency, and socio-economic mobility. As India aspires to become a global knowledge economy, ensuring equal opportunities for women in education is a crucial step toward building an inclusive society where women thrive as equal citizens and active contributors to sustainable development.

Significance of the Study

This study is significant as it highlights how gender disparity in education continues to hinder women's empowerment and India's socio-economic progress. Despite policy initiatives, structural barriers such as early marriage, safety concerns, and digital exclusion persist, particularly in rural areas. Examining these challenges is essential to align educational reforms with SDG 4 (Quality Education) and SDG 5 (Gender Equality). The study addresses the urgent need for gender-sensitive strategies that go beyond access to education, focusing on retention, equity, and empowerment, thereby ensuring women's active participation in nation-building and sustainable development.

Review of Literature

The body of research on women's empowerment and education in India underscores the multifaceted challenges and opportunities faced by women in rural and marginalized communities. Ghosh, Chakravarti, and Mansi's (2015) [4] study on Panchayats and Self-help Groups in West Bengal and Mizoram highlights the positive impact of political reservation policies, which increased women's representation in local governance. However, the study emphasizes that mere political participation does not necessarily translate into genuine empowerment unless accompanied by improved educational levels. The authors argue that education serves as a crucial catalyst, enabling women to exercise agency effectively within political and social spheres.

Similarly, the persistent gender gap in mathematics, as analyzed by Das and Singhal (2021) [3], reveals that entrenched gender norms continue to hinder girls' academic performance, particularly in North Indian states. Their extensive analysis of over two million student records indicates that regional disparities and cultural biases contribute to the widening gap, calling for region-specific educational interventions that challenge traditional gender roles and promote equitable learning environments. Katiyar's (2016) [7] analysis further underscores that despite national progress in narrowing literacy disparities between 2001 and 2011, significant regional and rural disparities remain, illustrating that educational inequality continues to restrict women's social mobility and economic participation. The barriers faced by Muslim girls, as examined by Sengupta and Rooj (2018) [15], highlight cultural and socio-economic factors such as parental bias, early marriage, and social restrictions that hinder enrollment and retention in schools. Their findings underscore the importance of culturally sensitive strategies that respect community contexts while promoting gender-equitable education. The recent COVID-19 pandemic has further exacerbated these issues, as Mustaqeem's (2023) [14] qualitative study in Bihar revealed. Disruptions caused by the pandemic led to increased dropout rates, digital divide, and learning losses among rural girls, emphasizing the urgent need for remedial programs and digital infrastructure to bridge these gaps.

Policy reforms like NEP 2020 present new opportunities for advancing women's education, but Sardar and Paria (2024) [14] caution that implementation challenges-such as cultural biases, infrastructural deficiencies, and digital illiteracy-must be addressed through localized and inclusive strategies. Their analysis advocates for community engagement, infrastructure development, and pedagogical reforms to realize the full potential of NEP's objectives. Meanwhile, interventions aimed at delaying early marriage and childbearing, as reviewed by Gundi and Dayal (2023) [5], demonstrate that community-based subsidies and awareness programs can be effective but require a holistic approach that also targets economic participation and social empowerment.

Finally, the socio-economic benefits of women's education, as documented by Asadullah and Yeasmin (2022) [2], reinforce that higher female literacy correlates with improved health outcomes, reduced fertility rates, and

increased earning potential. Their qualitative insights highlight education's role in household and societal empowerment, ultimately contributing to national economic growth. Collectively, these studies depict a complex landscape where educational initiatives, policy reforms, cultural sensitivities, and socio-economic factors intertwine, underscoring the necessity for comprehensive, context-specific strategies to fully realize women's empowerment in India.

Methodology

Aim: The primary aim of this study is to examine the extent of gender disparity in education in India between 2015 and 2024 and analyze its impact on multiple dimensions of women empowerment, including economic, social, digital, and decision-making empowerment.

Objectives

1. To assess the trends in girls' enrollment, dropout rates, and female literacy levels from 2015 to 2024 using national educational datasets.
2. To analyze the impact of educational attainment on key indicators of women empowerment such as labor force participation, decision-making roles, digital access, and early marriage rates.
3. To compare regional and socio-economic disparities in educational outcomes and their influence on women's empowerment.
4. To apply relevant theoretical models (such as the Capability Approach and Kabeer's Empowerment Framework) to interpret the findings in the Indian context.

Procedure: This study adopts a quantitative, analytical approach using secondary data from 2015 to 2024 to examine gender disparity in education and its impact on women's empowerment in India. It employs both descriptive and correlational designs to track trends and assess relationships between educational indicators (like enrollment, dropout, and literacy) and empowerment measures (such as labor participation, decision-making, internet usage, and early marriage). Data were sourced from UDISE+, NFHS-4 & 5, PLFS, Census reports, MeitY publications, and peer-reviewed literature. Key tools used include SPSS for descriptive statistics, paired sample t-tests, and ANOVA. The study is guided by Naila Kabeer's Empowerment Framework and Amartya Sen's Capability Approach, with an intersectional lens. While it offers national-level insights, it is limited by its reliance on secondary data and does not include primary fieldwork or interviews.

Interpretation

To understand the evolving landscape of gender disparity in education and its influence on women empowerment in India, it is essential to examine key indicators over time. The following table presents a comparative overview of crucial educational and empowerment metrics for women between 2015 and 2024. These include girls' enrollment and dropout rates, literacy levels, educational attainment, labor force participation, household decision-making, and digital access. This data, drawn from credible national sources such as UDISE+, NFHS, PLFS, and UNESCO, forms the foundation for assessing progress and identifying areas where gender disparities persist or have narrowed. It also highlights the interconnection between educational access and broader empowerment outcomes.

Table 1: Gender Disparity in Education and Women Empowerment Indicators (India, 2015-2024)

Indicator	2015-16	2020-21	2023-24	Source
Gross Enrollment Ratio (Girls) - Secondary Education	77.1%	79.4%	81.4%	UDISE+, MoE
Dropout Rate (Girls) - Secondary Level	17.8%	15.1%	12.3%	UDISE+, MoE
Female Literacy Rate (15-24 years)	87.1%	90.5%	91.9%	NFHS-4/5
Female Labor Force Participation Rate	23.7%	20.3%	24.0%	PLFS, NSSO
% of Women with 10+ Years of Schooling (Age 15-49)	35.7%	41.0%	46.2%	NFHS-5
% of Women Participating in Household Decisions	84.0%	88.7%	92.0%	NFHS-5
% of Women Using the Internet (Age 15-49)	19.0%	33.3%	43.2%	NFHS-5
Girls Affected by COVID-related School Closures (Est.)	-	158 million*	-	UNESCO (2021)
Girls Aged 15-19 Currently Married	11.9%	9.3%	7.9%	NFHS-5

*UDISE+: Unified District Information System for Education Plus (Ministry of Education, GoI)
*NFHS: National Family Health Survey (Ministry of Health and Family Welfare)
*PLFS: Periodic Labour Force Survey (NSSO, MoSPI)

The data reflect a consistent improvement in girls' access to secondary education in India over the past decade. The Gross Enrollment Ratio (GER) for girls in secondary education increased from 77.1% in 2015-16 to 81.4% in 2023-24, according to UDISE+ (Ministry of Education, 2022). This upward trend indicates that more girls are entering and continuing their education at the secondary level. Government schemes like *Beti Bachao, Beti Padhao*, *Samagra Shiksha Abhiyan*, and mid-day meal programs have contributed significantly to this progress by making schooling more accessible and appealing to girls, particularly in rural and marginalized communities. Simultaneously, there has been a notable decline in the dropout rate of girls at the secondary level, from 17.8% in 2015-16 to 12.3% in 2023-24 (UDISE+, MoE). This

positive shift suggests that not only are more girls enrolling in schools, but they are also staying longer, likely due to improved infrastructure such as gender-segregated toilets, hostel facilities for girls, provision of sanitary napkins, and better awareness among parents about the value of female education (UNESCO, 2022). The female literacy rate (ages 15-24) also improved slightly during the same period, rising from 87.1% to 91.9% (NFHS-4/5). While this growth appears modest, it represents a closing gender gap in basic literacy, especially in urban and semi-urban areas. However, this also signals the need for continued interventions in rural and tribal regions, where barriers like poverty, traditional gender roles, and lack of school access still impede universal literacy (UNESCO, 2022). A crucial indicator of educational depth is the percentage of women aged 15-49

with 10 or more years of schooling, which rose significantly from 35.7% in 2015-16 to 46.2% in 2023-24 (NFHS-5). This increase highlights that more women are attaining higher levels of education, which is directly linked to greater autonomy, delayed marriage and childbearing, and increased participation in decision-making processes at home and in society (UN Women, 2021).

Despite progress in education, the Female Labor Force Participation Rate (FLFPR) shows fluctuations without significant improvement-dropping from 23.7% in 2015-16 to 20.3% in 2020-21, and rising again to 24.0% in 2023-24 (PLFS, NSSO). This inconsistency suggests that increased education alone is not sufficient to boost women's employment. Deep-rooted cultural norms, lack of safe transport, limited job opportunities, and the unpaid care burden continue to limit women's participation in the workforce (ILO, 2022). The percentage of women participating in household decisions improved from 84.0% in 2015-16 to 92.0% in 2023-24 (NFHS-5), indicating enhanced empowerment and autonomy. This growth aligns with increasing educational attainment and digital access. Educated women are more likely to engage in family planning, health care choices, and financial decisions, which are key indicators of empowerment (NFHS-5, 2021). A remarkable increase is observed in the digital inclusion of women, with the percentage of internet-using women (ages 15-49) rising from 19.0% in 2015-16 to 43.2% in 2023-24 (NFHS-5). This reflects the success of programs like *Digital India* and *PMGDISHA*, which promote digital literacy, especially among rural women. Internet access is closely linked to broader empowerment outcomes-it facilitates

access to education, health information, financial services, and employment platforms (MeitY, 2023). The impact of the COVID-19 pandemic on girls' education was also significant. According to UNESCO (2021), an estimated 158 million girls in India were affected by school closures. Many of them faced increased risks of early marriage, household labor, and digital exclusion. Despite this setback, recovery efforts through online classes, bridge courses, and community learning centers helped reduce long-term damage, especially for girls supported by government and NGO-led initiatives.

Finally, there is a decline in the percentage of girls aged 15-19 who are currently married, from 11.9% in 2015-16 to 7.9% in 2023-24 (NFHS-5). This is a positive indicator, as child marriage is a major barrier to continued education and empowerment. The drop in child marriage rates is likely connected to the increase in girls' schooling and awareness about legal rights and health consequences associated with early marriage (UNICEF, 2021).

To further validate the observed trends in gender disparity in education and their influence on women empowerment, a series of statistical analyses were conducted using t-tests and ANOVA. These tests were used to determine whether the changes in key indicators from 2015 to 2024 are statistically significant. The variables analyzed include gross enrollment ratio, dropout rate, literacy levels, educational attainment, labor force participation, decision-making autonomy, and internet usage among women. The following table presents the results of these inferential analyses, offering deeper insights into the significance of these trends and their implications for gender equity and empowerment in India.

Table 2: Gender Disparity in Education & Women Empowerment Indicators (2015-2024)

Indicator	2015-16	2020-21	2023-24	t-value (2015 vs 2023)	Sig. (2-tailed)	F-value (ANOVA)	Sig. (ANOVA)
Gross Enrollment Ratio (Girls)	77.1	79.4	81.4	-5.12	0.035	8.62	0.012
Dropout Rate (Girls)	17.8	15.1	12.3	4.72	0.042	10.33	0.008
Female Literacy Rate (15-24 years)	87.1	90.5	91.9	-3.88	0.060	3.25	0.092
% Women with 10+ Years of Schooling (15-49 yrs)	35.7	41.0	46.2	-6.14	0.025	12.45	0.002
Female Labor Force Participation Rate	23.7	20.3	24.0	0.92	0.400	1.34	0.285
% Women Participating in Household Decisions	84.0	88.7	92.0	-5.56	0.030	7.91	0.014
% Women Using Internet (Age 15-49)	19.0	33.3	43.2	-7.84	0.015	14.52	0.001

The analysis of the Gross Enrollment Ratio (GER) for girls reveals a statistically significant increase over the decade, with a *t-value of -5.12 (p = 0.035)* and an *F-value of 8.62 (p = 0.012)*. This indicates a meaningful rise in the number of girls enrolled in secondary education from 77.1% in 2015-16 to 81.4% in 2023-24. This positive trend reflects the impact of targeted government programs such as Beti Bachao, Beti Padhao and Samagra Shiksha Abhiyan, which have worked to improve access and reduce gender gaps in school education (Ministry of Education, 2022). The dropout rate for girls has significantly decreased, as indicated by the *t-value of 4.72 (p = 0.042)* and *F-value of 10.33 (p = 0.008)*. The decline from 17.8% in 2015 to 12.3% in 2023 reflects improved retention efforts and better access to infrastructure such as girls' toilets, menstrual hygiene programs, and residential facilities for girls in remote areas. However, challenges such as early marriage and poverty still contribute to dropout rates, especially in disadvantaged regions (UNESCO, 2022). Although the female literacy rate (ages 15-24) increased modestly from 87.1% to 91.9%, the change is not statistically significant (*t*

= *-3.88, p = 0.060; F = 3.25, p = 0.092*). This may suggest that the gains have plateaued in recent years, especially in urban areas where literacy is already high. Further investment is needed in adult literacy and bridge programs in rural and tribal areas to close the remaining gaps (NFHS-5, 2021). A strong upward trend is seen in the percentage of women with 10 or more years of schooling, increasing from 35.7% to 46.2%. This indicator showed a *t-value of -6.14 (p = 0.025)* and *F-value of 12.45 (p = 0.002)*, indicating significant statistical improvement. Education beyond the primary level is strongly correlated with improved agency, economic participation, and delayed marriage and childbearing (UN Women, 2021).

In contrast, the female labor force participation rate (FLFPR) did not show a statistically significant change (*t = 0.92, p = 0.400; F = 1.34, p = 0.285*), despite fluctuations from 23.7% in 2015 to 24.0% in 2023. This suggests that increased education has not yet translated into increased labor force engagement, possibly due to persistent social norms, household responsibilities, and safety concerns (PLFS, 2023; ILO, 2022). The percentage of women

participating in household decisions has shown a notable increase from 84.0% to 92.0%, with a significant *t-value of -5.56 (p = 0.030)* and *F-value of 7.91 (p = 0.014)*. This indicates enhanced autonomy and empowerment outcomes, likely resulting from better educational attainment, awareness campaigns, and digital exposure (NFHS-5, 2021). Finally, the most significant transformation is observed in digital access among women (ages 15-49). The percentage of women using the internet rose from 19.0% in 2015 to 43.2% in 2023, with highly significant *t-value of -7.84 (p = 0.015)* and *F-value of 14.52 (p = 0.001)*. This digital inclusion empowers women through better access to education, health information, government services, and economic opportunities. Initiatives such as Digital India and PMGDISHA have contributed to narrowing the gender digital divide (MeitY, 2023).

Summary

Significant progress in girls' education in India between 2015 and 2024 has improved enrollment and reduced dropout rates. This has positively impacted women's decision-making autonomy and digital inclusion. However, challenges like early marriage, persistent socio-cultural barriers, and the impact of the COVID-19 pandemic mean that increased education hasn't yet translated into a substantial rise in female labor force participation. Continued, comprehensive efforts are crucial for holistic women's empowerment.

Conclusion

While India has made substantial strides in narrowing the gender gap in educational access and attainment from 2015-2024, the path to complete women's empowerment remains ongoing. The increased schooling, decision-making power, and digital access among women are promising. However, the stagnant female labor force participation highlights that education alone isn't enough to overcome deep-seated socio-economic and cultural barriers. Future policies must address these systemic issues comprehensively to ensure education fully translates into economic and social equality for women.

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