



Empowerment of women from the experience of Indian states: a reflection of NFHS-5

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Abstract The present study attempts to analyze the level of women's empowerment across India based on the recently released NFHS-5 (National Family Health Survey) dataset. To delineate interstate disparities in women's empowerment, the Women Empowerment Index has been constructed using six dimensions and eighteen variables. A correlation matrix has also been used to evaluate the relationships between the chosen variables. The study reveals that Goa, Punjab, Chhattisgarh, and Sikkim have comprehensive levels of women's empowerment, while Rajasthan, Andhra Pradesh, West Bengal, and Bihar have significantly lower levels. The study further discloses that the persistency of low women empowerment is not only concentrated across the so called 'BIMARU' (Bihar, Madhya Pradesh, Rajasthan and Uttar Pradesh) states but also in several other states including Andhra Pradesh, West Bengal, Tripura. Surprisingly, Kerala, frequently cited for its high status of women, is not among the top fifteen states whereas, a relatively underdeveloped state like Chhattisgarh claims third place in women empowerment index. The study recommends that along with all other government initiatives, there should be a

strong focus on women's empowerment, particularly their ability to make decisions and participate economically in society.

Keywords Women empowerment · Sustainable Development Goals (SDGs) · Gender equality · Women Empowerment Index (WEI) · NFHS-5 · India

Introduction

Every day we hear about issues that women confront daily, both outside and inside the home. In every community, women hold a subordinate status. In India, a nation rich in tradition and culture, women are considered goddesses. However, women are harassed, abused, and seen as a weaker societal group. The most unfortunate aspect of women's lack of access to and mobility in the outside world is their inability to make decisions regarding their health conditions, adversely compromising their reproductive health (Singh et al., 2018a, b).

Indian traditional society is patriarchal in nature. The norms, beliefs, rituals, and values of this community frequently impose restrictions on women, resulting in distinct standards of conduct for men and women (Kabeer, 2000). The main barrier to women's emancipation is hence their dependence on men. The fifth target of the Sustainable Development Goals (SDG-5) is women's empowerment, which is a continual process that enables women to participate in every

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aspect of their lives and decision-making, directly affecting their well-being. There are different ways to conceptualise and define women's empowerment because it is multidimensional in nature and an intricate issue to describe. The United Nations Development Fund for Women (UNIFEM) defined women's empowerment as "having access to and control over the means to make a living on a sustainable and long-term basis and receiving the material benefits of this access and control" (Carr, 2000). Women empowerment has also been defined as allowing and equipping women to make life choices so that they can become self-reliant and have a sense of self-worth (Bayeh, 2016; Kaviarasu & Xavier, 2006; Malik, 2021). Women's empowerment entails equitable possibilities for employment, political engagement, and access to other development-related factors, such as health and education (Duflo, 2011). Kabeer (1999a, b) also conceptualized women's empowerment as a "process by which those who have been denied the ability to make strategic life choices acquire such ability".

When it comes to the idea and implementation of women's empowerment, India lags behind in comparison to Western nations. India's government has passed numerous laws as well as several flagship programmes including Beti Bachao Beti Padhao, Pradhan Mantri Ujjwala Yojana, Mahila-E-Haat, Pradhan Mantri Janani Suraksha Yojana, Swadhar Greh, Pradhan Mantri Matru Vandana Yojana etc. (MOW & CD, 2021) since independence so that women can contribute equally to the growth and development of the nation by 2030. As a result, there is an increase in efforts to support women's access to resources, education, and work as well as their protection and promotion of human rights and fundamental freedoms, allowing them to make decisions free from coercion or discrimination. However, even after more than seven decades of independence and numerous initiatives, Indian women face a lot of discrimination and injustice (Pradhan, 2020). According to a recent report released by the World Economic Forum, India has dropped 28 places and ranked 140th among 150 nations in the global gender gap. The gap in India has widened to 62.5% due to various factors such as a decrease in women's labour force participation, inadequate representation of women in politics and leadership roles, and lagging female to male literacy rates (Shettigar & Mishra, 2021). The complexity of defining women's empowerment and its many domains has led to challenges in identifying indicators and methods

for measuring women's empowerment. To compute women empowerment numerous measures have been formulated at international and regional levels. In 1995, UNDP (United Nations Development Program) in its pioneer approach presented two major indices, namely Gender Development Index (GDI) and Gender Empowerment Index (GEI). Gender Development index (GDI) measures gender inequality based on three indicators related to health, Knowledge and GDP relating to purchasing power of a country. Whereas Gender Empowerment Index (GEI) measures gender inequality in key areas of economic and political participation and decision-making. It differs from GDI as GEI focuses on decision making while GDI works on basic indicators (Muyoyeta, 2007). Further in 2010, the Gender Inequality Index (GII) was constructed by UNDP by taking indicators both from GDI and GEM and incorporating a few more indicators of women's vulnerability. World Economic Forum (2015) also releases Gender Gap Index that includes a broad range of dimensions such as economic participation and opportunity, political empowerment, educational attainment, health and well-being. Alkire et al. (2013) constructed a unique empowerment index (SDE) to reflect the proportion of women empowerment as well as intensity of disempowerment based on five dimensions: 1) Production, 2) Resources, 3) Control over income, 4) Leadership and 5) Time use. Narayanan et al. (2019) constructed Women's Empowerment in Nutrition Index (WENI) to measure nutritional empowerment which involves the process by which individuals acquire the capacity to be well fed and healthy, in a context where this capacity was previously denied to them. Thus, it can be said that measurement of women empowerment includes a broad range of parameters that is education, health, economic participation, socio-cultural and political opportunity (Chang, et al., 2013; Sharma & Sanchita, 2017).

As women empowerment is a multidimensional phenomenon, it is important to pay particular attention to the identification of the parameters for its measurement (Malhotra et al., 2002). Authors like Bloom et al., 2001, Bhagowalia et al., 2012 have identified mainly four elements (1) decision-making power of women; (2) mobility outside the house or physical autonomy; (3) attitude towards domestic violence; and (4) economic independence to compute women empowerment. Different academics have approached the idea of "empowerment" in different ways. For instance, empowerment has been reckoned

through the lens of autonomy (Dyson & Moore, 1983; Jejeebhoy & Sathar, 2001); improving bargaining power (Agarwal, 1997; Eswaran & Malhotra, 2011); women's engagement in income generation (George, 2012; Vyas & Watts, 2009); access to resources and autonomy (Eswaran & Malhotra, 2011) and so forth.

In India several studies have been conducted so far in context to women empowerment. Gupta and Yesudian (2006) tried to analyze the spatial and socio economic and cultural disparities with the help of four indices— household autonomy index, mobility index, attitude towards gender index and attitude towards domestic violence index. They identified Women's educational levels; media exposure and age are important predictors of woman's empowerment. Based on NFHS-4 dataset Mishra (2019) presents a comparative picture of disempowerment of women in India in 2015–16 with the same in 2005–06, and reveals that at all India level, there is a reduction in severe disempowerment, but a notable proportion of previously non-disempowered women became mildly disempowered. Singh et al. (2018a, b) based on two rounds of NFHS (3 & 4) tries to envisage the relationship between the recent waves of women's empowerment and use of contraceptive methods across different states of India and unveils that regardless of the recent wave of women's empowerment, the acceptance and utilization of contraceptive methods have not been enhanced. Mishra and Banerjee (2022) employing data from NFHS-4 computed a multidimensional disempowerment index for women in India and revealed that disempowerment levels of women from the states of Haryana, Uttar Pradesh, Odisha, Madhya Pradesh, Karnataka and Bihar are found to be higher. Biswas and Banu (2023) tried to compare the magnitude of women's economic empowerment in urban India with its rural counterpart by constructing Economic Empowerment Index, and observed that rural women are more economically empowered in comparison with their urban counterparts. Gupta et al. (2019) based on the WEAI (Women's Empowerment in Agriculture Index) assessed that the major drivers of women's disempowerment in India are group membership, asset ownership and decision making related to agricultural credit. Sharma and Das (2021) seek to highlight the need for women empowerment and present an integrated model considering three main dimensions, namely, economic, social and human, and legal empowerment to showcase the ways to achieve the same in society, particularly in rural

areas. They unveiled that reforms are required to make rural women economically independent, providing them social freedom and utilities and ensuring a strict and favourable judiciary system for ensuring women empowerment. Kumari and Siotra (2023) tried to analyse the level of women empowerment in different states of India and found that female literacy, government support in the form of infrastructure and schemes act, and Self Help organisations are catalyst in women empowerment.

Although several studies have been done so far in context to women empowerment in India studies examining the spatial heterogeneity in the degree of women's empowerment in relation to India, however, are few and far between. For this endeavour, in the present study, a composite index of women's empowerment (WEI) has been developed to portray the overall state-wise scenario of women's empowerment and inter-state disparities based on WEI obtaining data from the NFHS-5. Beside this study seeks to explore and analyse the relationship between the identified variables of women empowerment. The study has tried to address the following research questions: First, how women empowerment differs across the states in India? Second, why some states are much ahead in different dimensions of women empowerment compared to the others? And finally how these indicators are interrelated with one another?

This paper complements the existing knowledge in two additional components: First, it tries to unveil the spatial heterogeneity in the pattern of women empowerment across the states of India. Second, the study can figure out the reasons behind the persistence of within-state inequalities regarding women empowerment and may become a source for affirmative policy initiatives.

The remainder of this paper is organised as follows: The second section explains the rationality behind the selection of the indicators. The third section presents data and methods employed in the study. Results and discussions of the current research are explained in the fourth section. This is followed by a conclusion and recommendations in the final section.

Selection of indicators

The phenomenon of women's empowerment is a result of several interrelated factors. As a result, analysing it requires looking at the various elements that influence

and alter the process of women's empowerment. It is impossible to assess women's empowerment in any given geographic area entirely using a single metric. Instead, it ought to be evaluated using a wide range of attributes that are relevant and feasible. Furthermore, when examined separately, a lot of indicators do not offer an integrated and comprehensible picture of reality (Mondal et al., 2021). Hence, it is necessary to generate a composite women empowerment index based on a variety of indicators that are optimally blended. The empowerment of women has been widely acknowledged as a major factor that contributes to better demographic outcomes (Dyson & Moore, 1983). Because of its ambiguous and broad definition, women's empowerment presents a measurement challenge (Bishop & Bowman, 2014). The measurement of women's empowerment would be examined in terms of employment (Brooke, 2006), asset ownership (Khan et al. 2020; Amir-ud-Din et al., 2023), their ability to make decisions (Misra et al., 2021), their rights to mobility (Mehta & Sai, 2021), and their perceptions and experiences with domestic and spousal violence (Stöckl et al., 2021; Bulte & Lensink, 2021), etc., which would open a wider perspective on the vulnerability of sexual and reproductive health as well as their involvement in decisions about their own lives and futures. While most of the above mentioned studies evaluated empowerment considering single dimension in the present study,

women empowerment has been conceptualised on the basis of six dimensions: economic dimension, educational dimension, health dimension, dimension of decision-making, dimension against domestic violence, and dimension of freedom of mobility (Fig. 1). Based on prior empirical applications and the availability of data, 18 indicators of women's empowerment (Table 1) have been identified. All these indicators help to understand the position of each state in the context of women empowerment in a developing country like India.

Economic empowerment Economic empowerment impacts how a woman interacts economically with her immediate surroundings (Saha & Sangwan, 2019). It lessens the degree to which women are financially dependent on other family members within the family unit, which may enhance their standing within the family and lead to an increase in inter-spousal consultations in domestic affairs (Kabeer, 2001). Here, the economic empowerment domain consists of seven indicators—women's access and control over financial resources, including employment (in the last 12 months), earning of cash, earning more or about the same as their husband, having a bank or savings account that they themselves use, alone or jointly with their husband has partial or full ownership of the house and land; and the percentage who use mobile phone for financial transactions.

Fig. 1 Conceptual framework of women empowerment

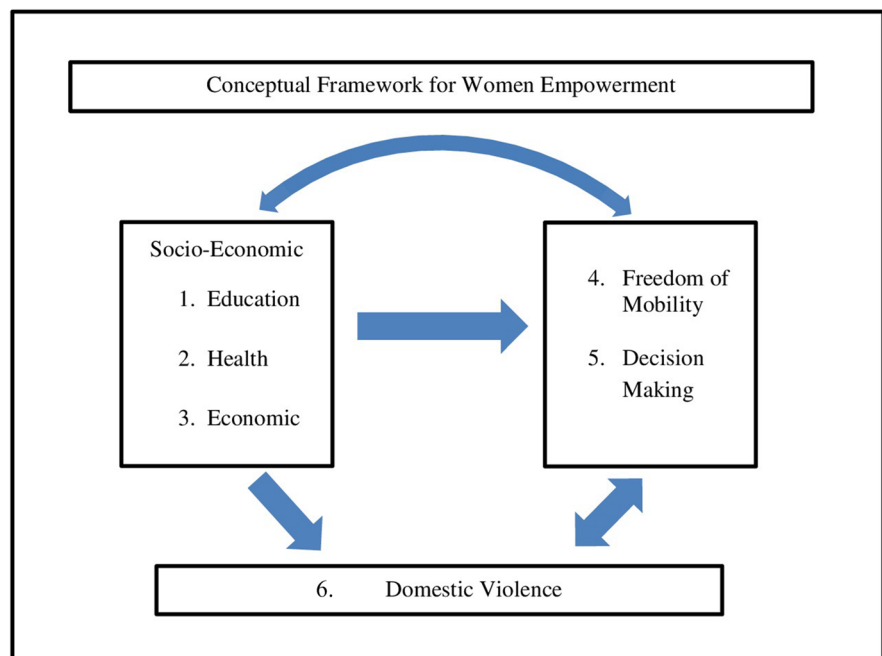


Table 1 Dimensions and indicators of women empowerment

| | Dimensions | | Indicators |
|---|-------------------------|-----------------|--|
| 1 | Economic Empowerment | X ₁ | Percentage employed in the past 12 months |
| | | X ₂ | Among those employed in the last 12 months percentage earning cash |
| | | X ₃ | Earn more or about the same as their husband |
| | | X ₄ | Percentage who have a bank or Savings account that they themselves use |
| | | X ₅ | Women owning house alone or jointly |
| | | X ₆ | Women Owning land alone or jointly |
| | | X ₇ | Percentage who use mobile phone for financial transactions |
| 2 | Educational Empowerment | X ₈ | Women Literacy Rate |
| | | X ₉ | Women with 10 or more years of schooling |
| 3 | Decision Making | X ₁₀ | Control over women's earning (decide alone or jointly) |
| | | X ₁₁ | Control over husband's earning (decide alone or jointly) |
| | | X ₁₂ | Percentage of women's decisions about own health care |
| | | X ₁₃ | Percentage of women's decisions about major household purchase |
| 4 | Domestic Violence | X ₁₄ | Attitudes towards wife beating |
| | | X ₁₅ | Attitudes towards Refusing Sexual intercourse with husband |
| 5 | Mobility | X ₁₆ | Freedom of movement (allowed to go alone to all three places*) |
| 6 | Empowerment in Health | X ₁₇ | Current Use of Family Planning Methods |
| | | X ₁₈ | Institutional births |

Compiled by Authors

* to the market, health facility and places outside the village or community

Educational empowerment According to numerous studies (Kabeer, 2005; Thang & Anh, 2002), increasing women's educational attainment increases their chances of finding employment and participating in the labour force, which gives them more financial freedom and leads to them beginning to use better health services. Additionally, education improves employment prospects (Adu et al., 2018; Gautam & Jeong, 2019), raises living standards through financial and other resources (Mumtaz et al., 2019; Rai et al., 2012), and modifies women's traditional views of power in the home, resulting in adjustments to decision-making and resource allocation within the family (Kabeer, 1999a, b; Yount et al., 2018). Furthermore, education is the cornerstone of all social, economic, and cultural development (Sen, 1994). In the present study, two indicators of educational empowerment have been considered: women literacy rate and women with 10 or more years of schooling.

Decision making power The ability of women to take decisions at the household, as well as community level that affect the circumstances of their own lives, is an essential aspect of women's empowerment

(Kumar, 2022). But the level of decision-making power may vary as they take decisions jointly or solo. According to several studies (Acharya et al., 2010; Kishor & Gupta, 2009), women who participate in decision-making alone or with their husbands are seen as having more power than other women at the household level. Here, within dimension of decision-making, four indicators have been incorporated: i) women, alone or jointly with their husbands, decide how their own earnings are used; ii) women, alone or jointly with their husbands, decide how their husband's earnings are used; iii) women's decisions about their own health care; and iv) women's decisions about major household purchases.

Protest against domestic violence Domestic violence has been dubbed a "hidden global pandemic" by the World Health Organisation (WHO) due to the devastating effects it has on women's lives, including physical, psychological, and sexual abuse (Ellsberg et al., 2001; WHO, 2006, 2019), all of which have a negative effect on women's empowerment. The realisation of sexual rights, or "the right to sexual freedom," appears to be necessary for women's

empowerment. Even in the twenty-first century, women are still less privileged in terms of their sexual rights, despite mounting evidence to the contrary (Singh et al., 2018a, b). According to research conducted in India, women who experienced domestic violence suffered from poor health for both themselves and their children. Domestic violence is thought to be a poor indicator of women's empowerment (Ackerson & Subramanian, 2008). Therefore, a woman who experiences domestic violence may suffer both short-term and long-term physical and psychological impairments. In keeping with this fact, two independent variables from the field of domestic violence—attitudes towards wife-beating (those who can protest) and attitudes towards refusing sexual intercourse with husband—have been taken into account in the current study to measure women's empowerment (dependent variable).

Freedom of mobility The mobility of women is another indicator of women's empowerment. Women themselves believed that increased mobility is a not only a form of empowerment (Finnis, 2017; Kabeer, 2012) but also a significant consequence for women's autonomy and economic agency (Mehta & Sai, 2021). For the measurement of WEI, women who have freedom of movement (if they are usually allowed to go alone to all three of the following places: the market, the health facility and places outside the village or community) have been considered independent variables.

Empowerment in health Female health is a key component of women's empowerment. Women's right to control their own fertility is absolutely essential for their empowerment and equality (Srivastava, 2009). It is argued that it will be challenging to make progress in the process of women's emancipation until policy-makers demonstrate a focused and long-term interest in the advancement of women by guaranteeing reproductive rights supported by high-quality healthcare services. Although the status of women in India has improved in many ways, patriarchal norms still have an impact on the choice to use contraception. Therefore, the current bottom-up, women's-centric approach to family planning programme implementation should emphasise women's autonomy over their own lives and health. Here, two positive indicators related to women's empowerment have been used, such as family planning methods (use of contraceptives) and institutional births.

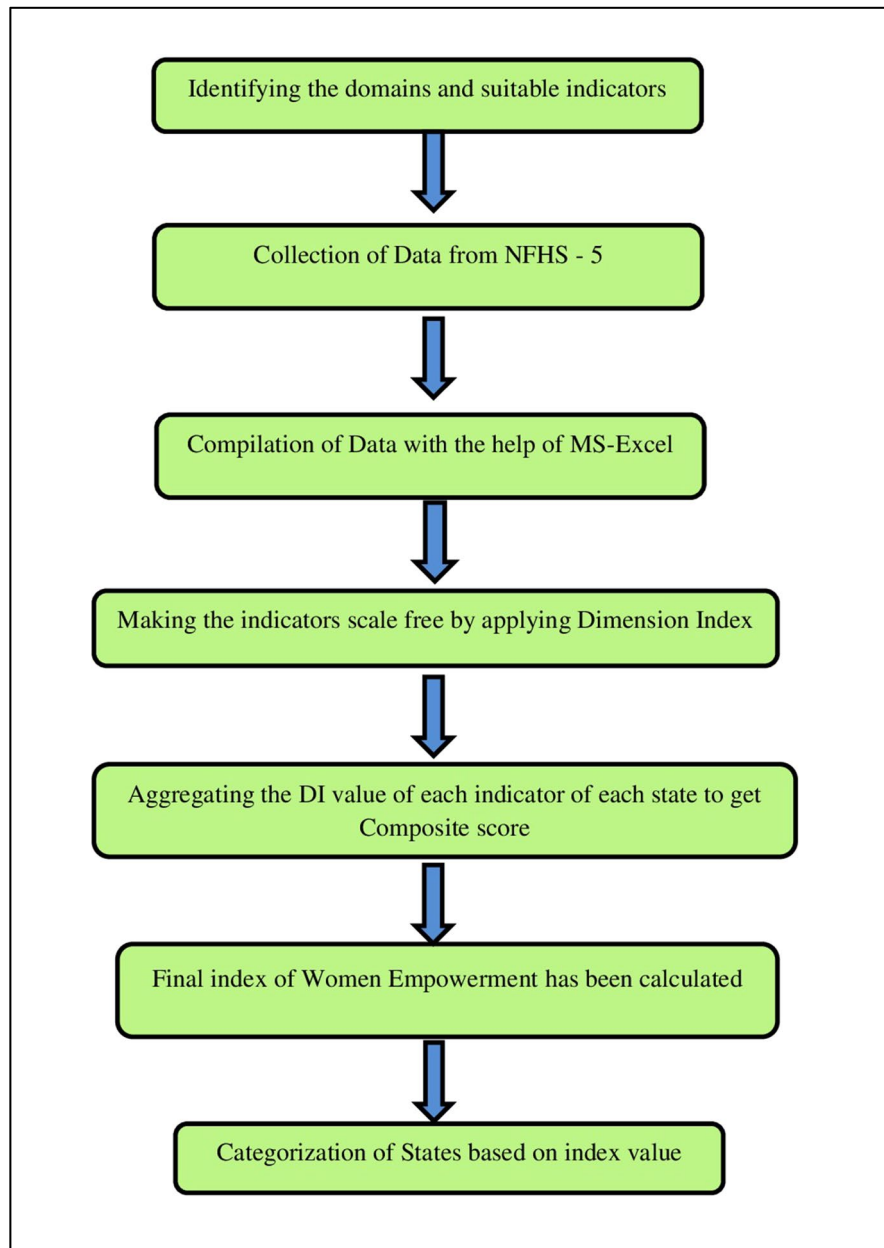
Data and methods

Data This study is based on the nationally representative NFHS-5 data conducted in 2019–2021. Under the direction of the Ministry of Health and Family Welfare (MoHFW), Government of India, the National Family Health Survey (NFHS) is a sizeable multi-round survey that provides estimates of various indicators at the national, state/union territory (UT), and district levels. For various NFHS rounds, the International Institute for Population Sciences in Mumbai has been designated as the nodal agency, and ICF International in Maryland, USA, has been offering technical support. Approximately 724,115 women between the ages of 15 and 49 who reside in 28 states, 8 union territories, and 707 districts across India were surveyed to gather information on various aspects of women's empowerment. The framework we have used to assess women's empowerment consists of six dimensions of women's empowerment.

Methods

This paper attempted to analyse spatial disparities in the level of women's empowerment with judiciously selected variables. A women empowerment index was created in the initial stage of analysis (Fig. 2). In the second stage of analysis, a correlation matrix was created to show how the identified variables interacted with one another. After collecting information on a number of pertinent variables from a comprehensive literature review, the data were initially standardised to make them unit less. Data normalisation is a prerequisite before constructing any composite index because the feature sets in different types of data vary. As a result, the fundamental goal of normalisation is to provide a consistent scale for various indicators without exaggerating the variances in the value ranges. According to many studies, scale equivalence creates a more stable relationship between datasets (Das et al., 2021). In the literature, standardising the indicators has been done using a variety of methods, including the z-score, Dimension index (DI), and ranking (Basel et al., 2020; Kumari & Raman, 2021). To normalise the indicators in our study, we employed the Dimension Index technique, which is used by the UNDP when generating the human development index. The value of the original dataset ranged from 0 to 1. Thus, the formula used for scale equivalence is as follows –

Fig. 2 Framework for constructing women empowerment index



$$DI_{ik} = \frac{X_{ik} - \text{Min}(X_{\dots k})}{\text{Max}(X_{\dots k}) - \text{Min}(X_{\dots k})} \tag{1}$$

where,

- i* 1, 2, …, n for the states in India
- k* 1, 2, …, n for the indicators of women empowerment
- Max*(*X*_{…*k*}) denotes the maximum value in a given state of the *k*_{th} indicator (*k*= 1, 2, …)

n) in entire nation and *Min*(*X*_{…*k*}) represents the minimum value of a given state in *k*_{th} indicator (*k* = 1, 2, 3) in the entire nation.

The value of *DI*_{*ik*} varies from zero to one, where the value of 1 implies that the given state is most empowered in that indicator in comparison to the other states in the country. The reverse is true for a value of 0.

After calculating DI of each indicator all the indicators wise values have been compiled for each state to get aggregate score. Later the composite score is divided by the number of indicators (here 18 indicators) to get the index value by using the following formula –

$$C_i = \frac{\sum_i^n = 1 \text{ Index } X_{ik}}{n} \quad (2)$$

where, C_i is the index value of each state, $\text{Index } X_{ik}$ is the value of each indicator (k) that makes up the index and n is the number of indicators.

The index value ranges from 0 to 1, with higher values indicating higher levels of empowerment, while a lower value signifies lower empowerment. Now, the main task is the categorization of different states under different classes of women empowerment considering their index score. Several methods are present to categorize a particular range of value in certain classes like natural breaks methods, quintile method, and equal interval method (Osaragi, 2002; Sahoo et al., 2023). In the present study equal interval method is used for categorization of the states under three strata of women empowerment: 1. High level of women empowerment, 2. Moderate level of women empowerment and 3. Low level of women empowerment. Stack bar chart and several cartographic maps have been prepared with the help of MS Excel and ArcGIS 10.5 software for better representation.

Results and discussion

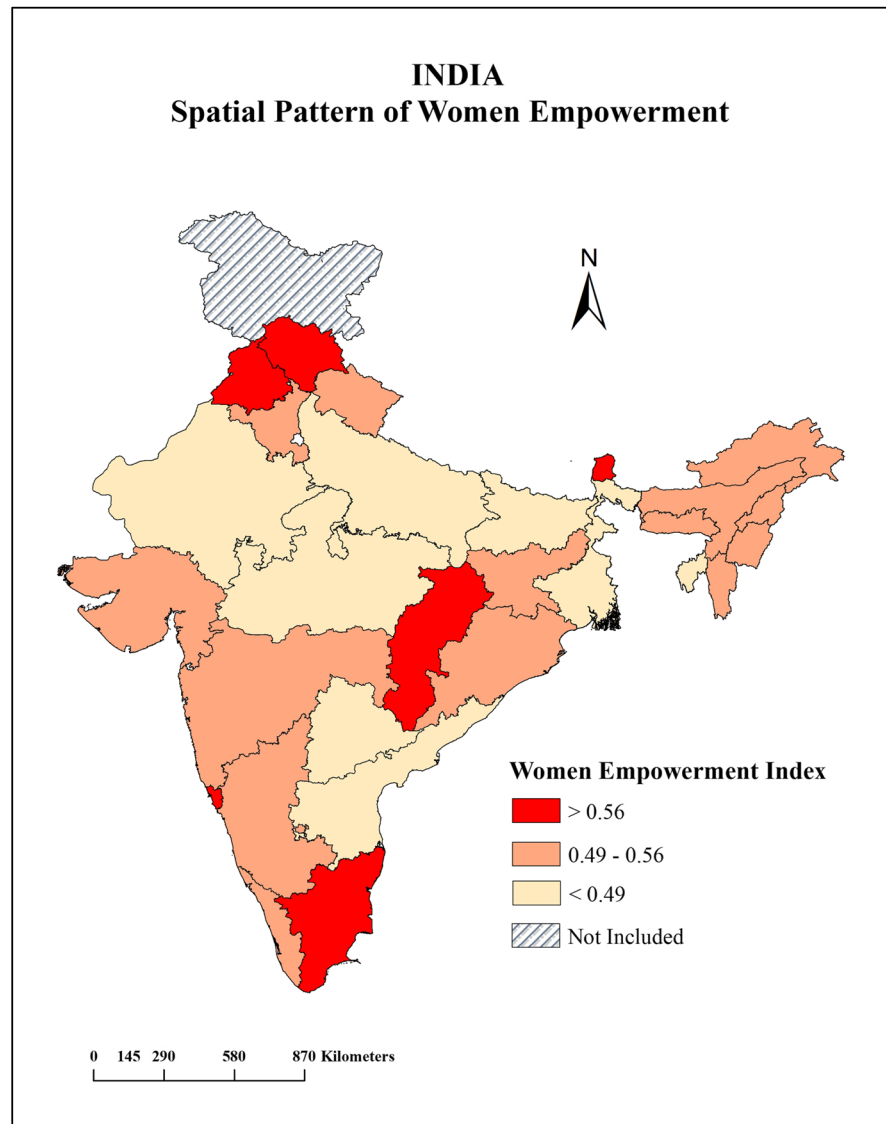
The present section attempts to determine the level of empowerment by categorising the Indian states into three groups based on the calculation of the Index value derived from eighteen indicators: High, Medium and Low levels of women's empowerment (Fig. 3).

i) Areas of high level of women empowerment

With a composite mean of the dimension index (DI) ranging from 0.58 to 0.67, six Indian states—Goa, Punjab, Chhattisgarh, Sikkim, Himachal Pradesh, and Tamil Nadu—are classified as having a high level of women's empowerment. Among these states, Goa (0.67) secures the best position

in terms of women's empowerment as the state has the highest DI value (1.00) in three indicators like institutional birth indicator, the percentage who use mobile phones for financial transactions, control over women's earning and has also earned a well position in indicators such as among those employed in the last 12 months, percentage earning cash, the percentage who have a bank or savings account that they use, women's literacy rate, level of schooling (12 or more years complete), attitudes towards refusing sexual intercourse with husband and use of contraceptive methods. Kumari and Siotra (2023), in their study, also recognised Goa as one of the most women-empowered state in India for performing exceptionally well in socio-cultural, educational and health components. The state's distinct set of civil laws controlling the populace is primarily responsible for its superior status in terms of women's empowerment when compared to the rest of the nation. In Goa, marriage registration is essential in order to ensuring security to married women (Desouza, 2004). An excellent sociocultural milieu and strong educational attainment ensure an impressive status of female health in the state (Kumari & Siotra, 2023). Though from our analysis three notable exceptions have been found in indicators like own a house alone or jointly (0.13), own a land alone or jointly (0.00) and freedom of movement (0.13). Goa, according to the Union Ministry of Labour and Employment, does not provide equal opportunities for women in the workforce despite having a high per capita income and a literacy rate of 88.7% (Patnaik, 2023). In light of this, it can be said that while Goa has the highest level of women's empowerment and thus performs exceptionally well in four areas, namely education, decision-making, domestic violence and health, the state's performance in the area of the economy is mediocre, and there are still some issues in the area of freedom of movement. A similar association was also observed by various scholars in the dimension of decision-making (Singh et. al., 2018b), in the economic, education and health dimension (Kumari & Siotra, 2023), in the dimension of domestic violence (Paul & Karmakar, 2022) etc. According to the study, Punjab ranked second in women empowerment index due to higher scores on several indicators, including among those employed in the last 12 months percentage earning cash, own a house

Fig. 3 Spatial pattern of women empowerment in India



alone or jointly, attitudes towards wife beating, attitudes towards refusing sex with the husband, current use of family planning methods and institutional births. In comparison to the other central Indian states, Chhattisgarh is far ahead in terms of women's empowerment despite experiencing acute multidimensional poverty and deprivation (Mondal et al., 2023). As per the NITI Aayog's SDG India Index report for 2020–21 Chhattisgarh is the best-performing state in India for the Sustainable Development Goals' gender equality parameter, which supports the aforementioned finding (PTI, 2021). The states is well ahead in indicators like percentage

employed in the past 12 months (0.99), earn more or about the same as their husband (0.83), attitudes towards wife beating (0.82), attitudes towards refusing sexual intercourse with husband (0.91), current use of family planning methods (0.88) (Table 3). Kumari and Siotra (2023) in their study also observed that Chhattisgarh performs exceptionally well in terms of political and economic component, a satisfactory performance in socio-cultural and health and a very poor performance in terms of educational component. Among the hilly states of the northeast and north India Sikkim and Himachal Pradesh portray an exception in respect to women's

empowerment and hold 4th and 5th rank respectively in the women empowerment index (WEI). Sikkim and Himachal Pradesh governments are giving priority to the education sector, especially female education and investing in educational infrastructure (Rana & Jyoti, 2018). In Sikkim, women are considered as an asset and the condition of women is better as instances of dowry related deaths and female infanticide have not been reported (Rai, 2019). In addition to the Sikkim government’s efforts to support rural livelihoods and create jobs through investments in ecotourism and organic farming, several non-governmental organisations (NGOs) and women-led groups in the state, such as Mantalya and Nayuma Women’s Cooperative Society, have been instrumental in elevating the status of women by giving jobs and helping women in need (Subha, 2014). As observed in Fig. 4, women of Sikkim earn more or about the same as their husbands (0.80) and also score high among those employed in the last 12 months percentage earning cash (0.80) and institutional birth (0.91). Though the women of the state have a mediocre performance in terms of decision making domain. While Himachal Pradesh instead of achieving bottom most position in indicator earn

more or about the same as their husband (0.00), the state has the highest DI value (1.00) in both indicators of domestic violence and freedom of movement (1.00) and has a well position in the health component too. The state has been honoured with the prestigious ‘Diamond State Award’ for its tremendous work on the upliftment and empowerment of the women. Several schemes namely Beti Hai Anmol Yojana, Mukhaya Mantri Kanyadaan Yojana also play a vital role regarding women empowerment in the state (Sanghaik, 2014).

ii) Areas of medium level of women empowerment

As per our analysis fourteen states, i.e., Gujarat, Jharkhand, Mizoram, Haryana, Uttarakhand, Arunachal Pradesh, Nagaland, Manipur, Odisha, Karnataka, Maharashtra, Meghalaya, Assam and Kerala of India fall under the category of moderate level of women empowerment with WEI score ranging from 0.49 to 0.58. The index reveals that these group of states perform well in indicators like women’s literacy rate, institutional birth, indicators of decision-making, while perform moderately in most of the indicators related to domestic violence and economic

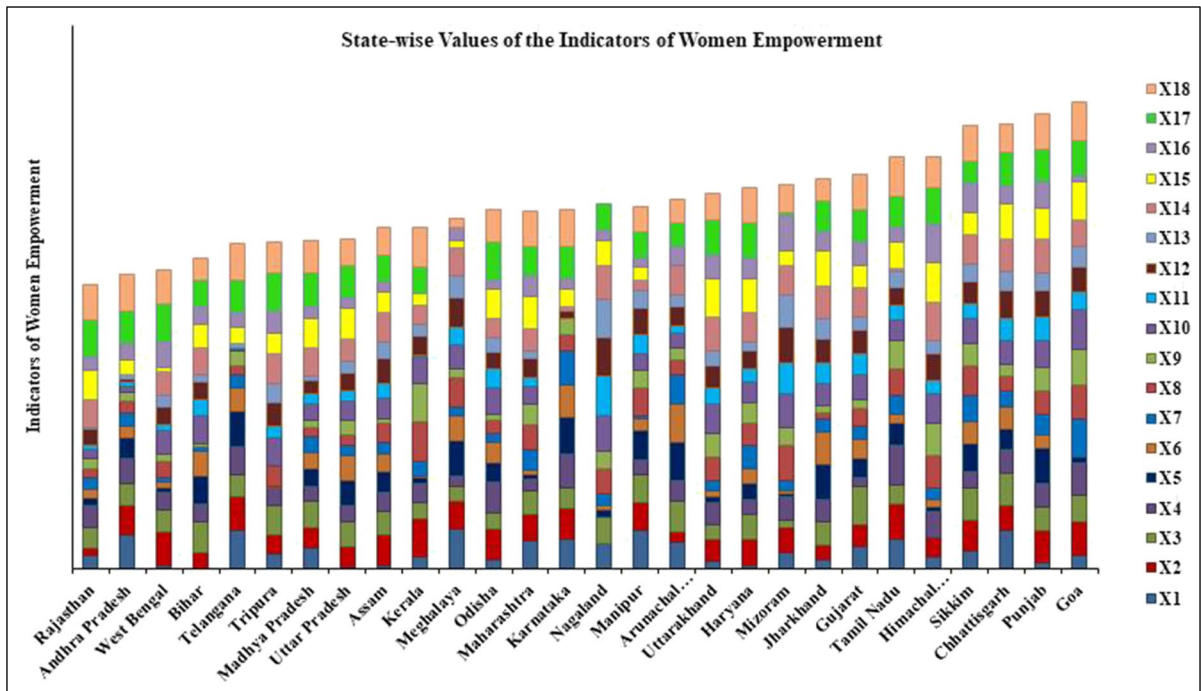


Fig. 4 Indicator wise values of women empowerment across the States of India

components (Fig. 3). Gujarat leads in this section with 0.56 index value and bear the highest percentage of women who's earning more or about the same as their husband. The state also acts well in both the indicators of domestic violence and the health dimension. The state has performed quite well in several indicators like control over women's earnings (0.66), percentage of women's decisions about their health care (0.61), freedom of movement (0.61) etc. Although the women of the state lag behind in several indicators namely percentage of women having bank or savings account that they themselves use (0.22), women with 10 or more years of schooling (0.24) etc. which should be taken into consideration from the state policy makers in near future. Six of the eight north-eastern states are included in this group too; with Mizoram acquiring the top most position due to its better achievement score in most of the indicators related to education, decision-making, domestic violence, freedom of movement, and health. Special attention still requires as the state does not perform well in a very few indicators such as owning a home alone or jointly (0.07), owning land alone or jointly (0.09) and using contraceptives (0.06). Meghalaya ranked first out of India's 28 states in terms of the percentage of women who were employed over the past 12 months, and Nagaland is in top position in three indicators like control over husband's earning (1.00), percentage of women's decisions about own health care (1.00) and major household purchase (1.00) and in 3rd position after Uttarakhand (0.89) and Punjab (0.88) in control over own earning (0.87). Kerala, which is known for its development model, portrays an interesting picture concerning women's empowerment. Despite the high levels of educational achievement of women, among those employed in the last 12 months, the percentage earning cash and good health care facilities, the level of women's empowerment is not so high in Kerala, due to the low score in ownership of the house (0.16), ownership of land alone or jointly (0.04), decision-making, domestic violence, and freedom of movement (0.00). In her study, Panicker (2016) also noted that while women in Kerala have access to a good education and are encouraged to work, they still make up only a fifth of the state's workforce. According to her due to severe labour shortages, many of them are forced into domesticity as their husbands are serving in the Gulf. She also portrayed that women are rarely seen on the roads after dusk in most towns for

fear of being branded as 'loose' or being attacked by the drunken layabouts who monopolise public spaces. Several scholars (Shekhar, 2021; Singariya & Shekawat, 2015) in their study also mentioned that absence of good quality formal jobs, increased expectation of educated females about jobs and rise in household income are some of the reasons which contribute to unemployment among educated females in Kerala.

iii) Areas of low level of women empowerment

Only eight of the twenty-eight states—Rajasthan, Andhra Pradesh, West Bengal, Bihar, Telangana, Tripura, Madhya Pradesh, and Uttar Pradesh—fall in this category, with index values ranging from 0.40 to 0.47. Among these states Rajasthan is the least empowered state followed by Andhra Pradesh (0.42) in India having an index value of 0.40 as the state has quite disappointing performance in terms of educational dimension- women literacy rate (0.23) and level of schooling (0.25); decision making dimensions like control over women's earning (0.25) and husband's earning (0.09), percentage of women's decisions about own health care (0.44) and about major household purchase (0.02); and freedom of movement dimension (0.32). Although the state, has performed well in some indicators under domestic violence [attitudes toward wife beating (0.71) and attitudes towards refusing sexual intercourse with husband (0.79)] and some of the indicators related to health dimension [use of contraceptive methods (0.94) and institutional birth (0.91)]. As witnessed from Table 3 all the states within this category perform very well in health dimension and West Bengal ranks first in indicator namely use of contraceptive methods having a DI value of 1.00. Few other states like Andhra Pradesh, Telangana and Madhya Pradesh also performs well in the economic dimension though they perform very low in the dimension of education, domestic violence and freedom of movement. Somehow Madhya Pradesh manages to secure its position in domestic violence due to higher score in indicators like attitudes towards wife-beating (0.72) and attitudes towards refusing sexual intercourse with husband (0.76). Our analysis reveals that among the north eastern states only Tripura fall under the category of low level of women empowerment. The state does not perform well in several indicators of women empowerment such as – asset ownership of house

(0.00) and land (0.03); use of mobile phone for financial transactions (0.00), level of schooling (0.00), control over husband’s earning (0.32). Similarly, the state Telangana has achieved the minimum score value in indicators like women’s decisions about their health care (0.00) and attitudes towards wife-beating (0.00). The rest of the states in this category like West Bengal, Bihar and Uttar Pradesh have a similar scenario in terms of women empowerment although Bihar has a very disappointing performance in terms of women’s literacy rate (0.00) and level of schooling

(0.10). Kumari and Siotra (2023) in their study identified Bihar as the least women empowered state of India due to very disappointing performance in terms of female education, economy and health parameters.

Correlation matrix of women empowerment indicators

To find out the association between the selected indicators of different dimensions of women empowerment the correlation matrix has been computed

Table 2 Intercorrelation matrix

| | X ₁ | X ₂ | X ₃ | X ₄ | X ₅ | X ₆ | X ₇ | X ₈ | X ₉ | X ₁₀ | X ₁₁ | X ₁₂ | X ₁₃ | X ₁₄ | X ₁₅ | X ₁₆ | X ₁₇ | X ₁₈ |
|-----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| X ₁ | 1.00 | | | | | | | | | | | | | | | | | |
| X ₂ | 0.10 | 1.00 | | | | | | | | | | | | | | | | |
| X ₃ | 0.11 | -0.16 | 1.00 | | | | | | | | | | | | | | | |
| X ₄ | 0.00 | 0.49 | -0.38 | 1.00 | | | | | | | | | | | | | | |
| X ₅ | 0.32 | 0.10 | 0.30 | 0.11 | 1.00 | | | | | | | | | | | | | |
| X ₆ | 0.16 | -0.13 | 0.31 | 0.03 | 0.86 | 1.00 | | | | | | | | | | | | |
| X ₇ | 0.13 | 0.22 | 0.14 | 0.36 | 0.21 | 0.19 | 1.00 | | | | | | | | | | | |
| X ₈ | 0.13 | 0.32 | -0.40 | -0.01 | -0.41 | -0.56 | 0.21 | 1.00 | | | | | | | | | | |
| X ₉ | -0.02 | 0.34 | -0.39 | 0.29 | -0.24 | -0.42 | 0.47 | 0.72 | 1.00 | | | | | | | | | |
| X ₁₀ | -0.42 | -0.12 | -0.12 | -0.21 | -0.51 | -0.47 | -0.13 | 0.51 | 0.29 | 1.00 | | | | | | | | |
| X ₁₁ | -0.04 | -0.34 | 0.04 | -0.31 | -0.09 | -0.14 | -0.18 | 0.25 | -0.02 | 0.71 | 1.00 | | | | | | | |
| X ₁₂ | -0.13 | -0.33 | -0.06 | -0.41 | -0.32 | -0.31 | -0.14 | 0.55 | 0.19 | 0.79 | 0.82 | 1.00 | | | | | | |
| X ₁₃ | 0.02 | -0.22 | -0.07 | -0.31 | -0.20 | -0.23 | -0.16 | 0.50 | 0.11 | 0.73 | 0.86 | 0.86 | 1.00 | | | | | |
| X ₁₄ | -0.48 | -0.49 | 0.02 | -0.44 | -0.33 | -0.10 | -0.09 | 0.16 | -0.02 | 0.68 | 0.51 | 0.70 | 0.45 | 1.00 | | | | |
| X ₁₅ | -0.31 | -0.15 | -0.10 | 0.19 | -0.26 | -0.20 | 0.17 | -0.04 | 0.30 | 0.29 | 0.24 | 0.15 | -0.03 | 0.36 | 1.00 | | | |
| X ₁₆ | -0.16 | -0.15 | -0.23 | -0.04 | -0.17 | -0.07 | -0.12 | 0.13 | 0.00 | 0.23 | 0.25 | 0.24 | 0.19 | 0.43 | 0.10 | 1.00 | | |
| X ₁₇ | -0.29 | 0.00 | 0.20 | 0.28 | -0.22 | -0.16 | 0.07 | -0.38 | 0.00 | -0.16 | -0.36 | -0.41 | -0.51 | -0.08 | 0.45 | -0.09 | 1.00 | |
| X ₁₈ | -0.12 | 0.61 | -0.04 | 0.62 | -0.13 | -0.19 | 0.36 | 0.02 | 0.30 | -0.31 | -0.60 | -0.56 | -0.61 | -0.38 | 0.15 | 0.05 | 0.47 | 1.00 |

Source: Compiled by Authors

X₁ Percentage employed in the past 12 months, X₂ Among those employed in the last 12 months percentage earning cash, X₃ Earn more or about the same as their husband, X₄ Percentage who have a bank or Savings account that they themselves use, X₅ Women owning house alone or jointly, X₆ Women Owning land alone or jointly, X₇ Percentage who use mobile phone for financial transactions, X₈ Women Literacy Rate, X₉ Women with 10 or more years of schooling, X₁₀ Control over women’s earning (decide alone or jointly), X₁₁ Control over husband’s earning (decide alone or jointly), X₁₂ Percentage of women’s decisions about own health care, X₁₃ Percentage of women’s decisions about major household purchase, X₁₄ Attitudes towards wife beating, X₁₅ Attitudes towards Refusing Sexual intercourse with husband, X₁₆ Freedom of movement (allowed to go alone to all three places*), X₁₇ Current Use of Family Planning Methods, X₁₈ Institutional births

(Table 2). Accordingly, each of the indicators once has been selected as a dependent indicator and the remaining as independent indicators and has been tested with the assumption that the linear relationship would prevail in all the cases which means the value of one depends on the value of the other. Table 2 portrays there is a positive association between women's literacy (X_8) and the percentage of women employed in the past 12 months (X_1), those who earn cash (X_2) and the percentage who use mobile phones for financial transactions (X_7); between four indicators of decision making (X_{10} , X_{11} , X_{12} and X_{13}) and attitudes towards wife-beating (X_{14}); freedom of movement (X_{16}) etc. Female literacy and education positively impact the decision-making of females, domestic violence, freedom of movement and health. Historically, men have held the highest positions in the hierarchy and supported their families, but in the modern era, as education increases women's earnings, they have more power to make decisions (Lundberg & Pollak, 1993; Yadav et al., 2020). Several studies have explored the fact that nowadays women can spend their earning on their own health care needs (Ahmed et al., 2010), significant household purchases (Yadav et al., 2020), and also able to leave their villages and go to the market and outside the villages (Becker et al., 2006; Bloom et al., 2001). Moreover increase in education level results in employment, better economic standing, and empowerment, all of which further increase the use of maternal health care by altering attitudes towards the need for medical attention. Numerous studies (Kabeer, 2005; Mason & Smith, 2000) have also discovered that raising women's levels of education increases their chances of finding employment, participating in the labour force, which gives them more financial freedom, and beginning to use better health services.

In contrary to this indicator like women's literacy rate (X_8) is negatively associated with several indicators like earning more or about the same as their husband (X_3), the percentage who have a bank or savings account that they themselves use (X_4), alone or jointly asset ownership of the house (X_5) and land (X_6); attitudes towards refusing sexual intercourse with husband (X_{15}) and use of contraceptive methods (X_{17}). Table 2 unveils that control over women's earnings (X_{10}) and control over husband's earnings (X_{11}) are highly positively correlated with the other two indicators of decision making namely the percentage of women's decisions about their own health

care (X_{12}) and about the major household purchase (X_{13}) and moderate to low positively correlated with two indicators of domestic violence—attitudes toward wife beating (X_{14}) and attitudes towards refusing sexual intercourse with husband (X_{15}) and with freedom of movement (X_{16}); whereas negatively correlated with health indicators of use of contraceptive methods (X_{17}) and institutional birth (X_{18}). As observed in Table 2 indicators of domestic violence are positively correlated with indicators of decision-making (X_{10} , X_{11} , X_{12} and X_{13}), freedom of movement (X_{16}) and health components (X_{17} and X_{18}) whereas negatively linked with indicators of economic dimension except earn more or about the same as their husband (X_3) indicators. Though in general, higher household autonomy and freedom of movement are being observed among working women in our study a contrasting situation has emerged among indicators of economic dimension (X_1 to X_7) and freedom of movement (X_{16}) which needs special attention.

Conclusion and recommendations

Since independence, India has tried to improve the socio-economic situation of the general population, particularly women. However, uneven distribution, unequal access, and patchy implementation of these policy interventions have led to skewed utilisation of developmental services. This study attempts to measure women's empowerment by highlighting six domains of empowerment based on 18 major indicators of women empowerment and its diversified nature throughout the states of India with the help of the NFHS-5 dataset.

The study reveals that the level of women's empowerment is not uniform across India rather large regional differentiation exists. Except Chhattisgarh most of the states lying geographically in the central part of the country, such as Madhya Pradesh and Uttar Pradesh, show low empowerment of women. Contrary to this northern states like Punjab, Himachal Pradesh, Haryana and Uttarakhand are in better position. As per WEI Rajasthan is the least women empowered state of India. Whereas within north-eastern part Sikkim and among the southern states of the country Goa and Tamil Nadu portray scenario of high level of women empowerment. States such as Goa, Tamil Nadu, Himachal Pradesh and Sikkim are in a far better position regarding women's empowerment because

of the government's support in various schemes and infrastructure like education, employment and health. As observed from our analysis the persistency of low women empowerment is not only concentrated across the so called 'BIMARU' (Bihar, Madhya Pradesh, Rajasthan and Uttar Pradesh) states but also in several other states including Andhra Pradesh, West Bengal, Tripura. Kumari and Siotra (2023) in their study also recognized BIMARU states as the least empowered states of the country for very poor performance in developmental, social and demographic parameters.

The study furthermore highlights the fact that the smaller states (Goa, Punjab, Sikkim etc.) in terms of geographical area are high in achieving equity in terms of various dimensions of women's empowerment as against larger states of India (Rajasthan, Madhya Pradesh, Uttar Pradesh etc.). However, we do not find any consistent patterns in these indices regarding state-level differences. The economic dimension does not offer a uniform image of Indian states for women empowerment. The women of Meghalaya and Chhattisgarh are well advanced in economic components, while Bihar and West Bengal portray the adverse situation. In education dimension of WEI Kerala secures the top most position while states like Bihar, Jharkhand, and Madhya Pradesh lag behind.

As witnessed from the study, female literacy and education positively impact the employment, work participation, freedom of movement and decision-making of women but do not affect the ownership of assets or attitudes towards domestic violence; in fact, the use of contraceptives and other economic components leave a negative impression on them. Government should focus on parallel investment in education, employment opportunities, poverty reduction and women's empowerment. This would lead to an increase in the participation rate of women in the labour force, which is an essential ingredient in women's financial freedom and empowerment.

Moreover, another interesting image emerges from the study that women who can raise their voices against domestic violence can also move freely, make decisions, and care for maternal health. The study elucidates that the uptake of contraceptive methods is associated with those women who can refuse sexual intercourse with their husbands. A surprising fact also emerged from the study is that the state Kerala, which is often quoted for its high status of women due to the prevalence of its high female literacy rate, does not rank in the top fifteen

states. Chhattisgarh, generally considered a backward and poverty-stricken state of the country, secures third position among states in the women empowerment index. The study shows that each state has been unable to empower women from every aspect due to diversified culture and socio-economic structure. Hence, the diversity of empowerment should be reduced, and equity should be attained to achieve sole empowerment. Besides, all the government programmes directed to reposition family planning services should be placed around various dimensions of women's empowerment, especially focusing on their economic existence in society and decision-making power. Moreover, women should be provided with the needed encouragement, support, opportunities, and facilities both within and outside their homes to properly handle their roles as mothers and socially productive individuals with dignity and respect. We need to address women's issues keeping in mind the dynamics involved in the region in terms of geopolitical and economic conditions as well as other social factors that impact these women's lives. Greater social participation of women in the decision-making process is assumed to erode the existing stereotypical social attitudes and values that exclude women.

Authors contribution Saheli Kumar has conceptualized the idea, prepared the draft of the manuscript, analysis the data, and interpreted the results. Soumyabrata Mondal has revised the draft, finalized the draft and prepared the maps.

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Data availability The data use in the study is freely available on the NFHS-5 report which is available at <https://dhsprogram.com/pubs/pdf/FR375/FR375.pdf>

Declarations

Ethics approval and consent to participate For the present study, "ethics approval and consent to participate" is not required because study does not involve human participants, their data, or biological material; however, our study area lies under the economics subject. The data used in the analysis is purely secondary data published by DHS and IIPS. Moreover, the data is freely available on their website, which everybody can use.

Consent for publication Not applicable.

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Appendix

Table 3 State-wise dimension index values of the indicators of women empowerment

| States | X ₁ | X ₂ | X ₃ | X ₄ | X ₅ | X ₆ | X ₇ | X ₈ | X ₉ | X ₁₀ |
|-------------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|-----------------|
| Rajasthan | 0.32 | 0.20 | 0.55 | 0.56 | 0.19 | 0.21 | 0.32 | 0.23 | 0.25 | 0.25 |
| Andhra Pradesh | 0.86 | 0.77 | 0.55 | 0.64 | 0.56 | 0.29 | 0.35 | 0.28 | 0.23 | 0.18 |
| West Bengal | 0.05 | 0.87 | 0.59 | 0.45 | 0.12 | 0.14 | 0.14 | 0.42 | 0.16 | 0.61 |
| Bihar | 0.00 | 0.42 | 0.78 | 0.46 | 0.73 | 0.65 | 0.09 | 0.00 | 0.10 | 0.69 |
| Telangana | 0.96 | 0.88 | 0.57 | 0.73 | 0.90 | 0.62 | 0.35 | 0.23 | 0.37 | 0.05 |
| Tripura | 0.37 | 0.50 | 0.74 | 0.46 | 0.00 | 0.03 | 0.00 | 0.55 | 0.00 | 0.70 |
| Madhya Pradesh | 0.52 | 0.52 | 0.70 | 0.39 | 0.44 | 0.43 | 0.40 | 0.25 | 0.16 | 0.44 |
| Uttar Pradesh | 0.04 | 0.52 | 0.64 | 0.41 | 0.67 | 0.63 | 0.27 | 0.26 | 0.40 | 0.47 |
| Assam | 0.07 | 0.79 | 0.60 | 0.52 | 0.50 | 0.48 | 0.30 | 0.47 | 0.13 | 0.54 |
| Kerala | 0.28 | 1.00 | 0.40 | 0.52 | 0.16 | 0.04 | 0.38 | 1.00 | 1.00 | 0.68 |
| Meghalaya | 1.00 | 0.74 | 0.39 | 0.24 | 0.91 | 0.66 | 0.22 | 0.77 | 0.21 | 0.61 |
| Odisha | 0.23 | 0.78 | 0.42 | 0.80 | 0.50 | 0.51 | 0.25 | 0.34 | 0.13 | 0.71 |
| Maharashtra | 0.70 | 0.68 | 0.61 | 0.32 | 0.11 | 0.10 | 0.56 | 0.64 | 0.52 | 0.45 |
| Karnataka | 0.75 | 0.81 | 0.51 | 0.88 | 0.95 | 0.83 | 0.88 | 0.43 | 0.40 | 0.00 |
| Nagaland | 0.62 | 0.00 | 0.69 | 0.00 | 0.18 | 0.12 | 0.31 | 0.67 | 0.42 | 0.94 |
| Manipur | 0.97 | 0.71 | 0.75 | 0.36 | 0.78 | 0.29 | 0.09 | 0.71 | 0.47 | 0.42 |
| Arunachal Pradesh | 0.67 | 0.25 | 0.82 | 0.51 | 1.00 | 1.00 | 0.77 | 0.38 | 0.28 | 0.37 |
| Uttarakhand | 0.18 | 0.57 | 0.36 | 0.58 | 0.15 | 0.15 | 0.29 | 0.58 | 0.63 | 0.75 |
| Haryana | 0.08 | 0.65 | 0.68 | 0.35 | 0.43 | 0.40 | 0.57 | 0.58 | 0.54 | 0.55 |
| Mizoram | 0.42 | 0.63 | 0.19 | 0.60 | 0.07 | 0.09 | 0.25 | 0.92 | 0.46 | 0.86 |
| Jharkhand | 0.20 | 0.41 | 0.61 | 0.56 | 0.90 | 0.85 | 0.32 | 0.16 | 0.18 | 0.57 |
| Gujarat | 0.54 | 0.58 | 1.00 | 0.22 | 0.50 | 0.48 | 0.36 | 0.43 | 0.24 | 0.66 |
| Tamil Nadu | 0.75 | 0.92 | 0.49 | 1.00 | 0.59 | 0.24 | 0.49 | 0.68 | 0.70 | 0.53 |
| Himachal Pradesh | 0.31 | 0.47 | 0.00 | 0.68 | 0.12 | 0.21 | 0.29 | 0.84 | 0.83 | 0.77 |
| Sikkim | 0.46 | 0.80 | 0.80 | 0.45 | 0.69 | 0.57 | 0.69 | 0.76 | 0.56 | 0.66 |
| Chhattisgarh | 0.99 | 0.65 | 0.83 | 0.58 | 0.55 | 0.55 | 0.42 | 0.41 | 0.29 | 0.60 |
| Punjab | 0.16 | 0.81 | 0.60 | 0.63 | 0.90 | 0.33 | 0.56 | 0.58 | 0.61 | 0.69 |
| Goa | 0.32 | 0.89 | 0.66 | 0.86 | 0.13 | 0.00 | 1.00 | 0.88 | 0.92 | 1.00 |

Table 3 (continued)

| States | X ₁₁ | X ₁₂ | X ₁₃ | X ₁₄ | X ₁₅ | X ₁₆ | X ₁₇ | X ₁₈ | CI | Remarks |
|-------------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|------|------------------------------|
| Rajasthan | 0.09 | 0.44 | 0.02 | 0.71 | 0.79 | 0.32 | 0.94 | 0.91 | 0.40 | Low women empowerment |
| Andhra Pradesh | 0.11 | 0.08 | 0.09 | 0.00 | 0.38 | 0.41 | 0.87 | 0.94 | 0.42 | |
| West Bengal | 0.16 | 0.47 | 0.30 | 0.61 | 0.09 | 0.65 | 1.00 | 0.85 | 0.43 | |
| Bihar | 0.44 | 0.44 | 0.21 | 0.67 | 0.63 | 0.42 | 0.71 | 0.56 | 0.44 | |
| Telangana | 0.02 | 0.00 | 0.12 | 0.00 | 0.41 | 0.37 | 0.84 | 0.95 | 0.46 | |
| Tripura | 0.32 | 0.60 | 0.49 | 0.79 | 0.50 | 0.57 | 0.99 | 0.80 | 0.47 | |
| Madhya Pradesh | 0.24 | 0.36 | 0.10 | 0.72 | 0.76 | 0.32 | 0.88 | 0.83 | 0.47 | |
| Uttar Pradesh | 0.27 | 0.47 | 0.30 | 0.58 | 0.77 | 0.29 | 0.81 | 0.70 | 0.47 | |
| Assam | 0.37 | 0.64 | 0.44 | 0.75 | 0.51 | 0.29 | 0.69 | 0.71 | 0.49 | |
| Kerala | 0.02 | 0.51 | 0.32 | 0.46 | 0.33 | 0.00 | 0.69 | 1.00 | 0.49 | |
| Meghalaya | 0.48 | 0.73 | 0.57 | 0.75 | 0.19 | 0.31 | 0.00 | 0.23 | 0.50 | |
| Odisha | 0.50 | 0.41 | 0.36 | 0.51 | 0.74 | 0.23 | 0.99 | 0.86 | 0.51 | |
| Maharashtra | 0.23 | 0.49 | 0.20 | 0.57 | 0.85 | 0.50 | 0.77 | 0.91 | 0.51 | |
| Karnataka | 0.00 | 0.21 | 0.00 | 0.10 | 0.47 | 0.25 | 0.85 | 0.95 | 0.51 | |
| Nagaland | 1.00 | 1.00 | 1.00 | 0.87 | 0.63 | 0.26 | 0.68 | 0.00 | 0.52 | |
| Manipur | 0.48 | 0.69 | 0.44 | 0.26 | 0.35 | 0.24 | 0.69 | 0.63 | 0.52 | |
| Arunachal Pradesh | 0.20 | 0.48 | 0.34 | 0.73 | 0.00 | 0.51 | 0.60 | 0.62 | 0.53 | |
| Uttarakhand | 0.41 | 0.58 | 0.36 | 0.89 | 0.99 | 0.61 | 0.92 | 0.69 | 0.54 | |
| Haryana | 0.32 | 0.47 | 0.21 | 0.78 | 0.87 | 0.51 | 0.92 | 0.91 | 0.55 | |
| Mizoram | 0.83 | 0.89 | 0.86 | 0.74 | 0.39 | 0.90 | 0.06 | 0.74 | 0.55 | |
| Jharkhand | 0.56 | 0.61 | 0.52 | 0.82 | 0.93 | 0.50 | 0.78 | 0.56 | 0.56 | |
| Gujarat | 0.51 | 0.61 | 0.34 | 0.77 | 0.56 | 0.61 | 0.84 | 0.90 | 0.56 | |
| Tamil Nadu | 0.39 | 0.48 | 0.41 | 0.08 | 0.68 | 0.37 | 0.81 | 1.00 | 0.59 | |
| Himachal Pradesh | 0.34 | 0.68 | 0.34 | 1.00 | 1.00 | 1.00 | 0.96 | 0.79 | 0.59 | |
| Sikkim | 0.37 | 0.57 | 0.48 | 0.75 | 0.58 | 0.76 | 0.57 | 0.91 | 0.63 | |
| Chhattisgarh | 0.59 | 0.70 | 0.51 | 0.82 | 0.91 | 0.45 | 0.88 | 0.74 | 0.64 | |
| Punjab | 0.63 | 0.68 | 0.44 | 0.88 | 0.80 | 0.69 | 0.82 | 0.90 | 0.65 | |
| Goa | 0.45 | 0.68 | 0.50 | 0.71 | 0.99 | 0.13 | 0.90 | 1.00 | 0.67 | |

Compiled by Authors

X₁ Percentage employed in the past 12 months, X₂ Among those employed in the last 12 months percentage earning cash, X₃ Earn more or about the same as their husband, X₄ Percentage who have a bank or Savings account that they themselves use, X₅ Women owning house alone or jointly, X₆ Women Owning land alone or jointly, X₇ Percentage who use mobile phone for financial transactions, X₈ Women Literacy Rate, X₉ Women with 10 or more years of schooling, X₁₀ Control over women's earning (decide alone or jointly), X₁₁ Control over husband's earning (decide alone or jointly), X₁₂ Percentage of women's decisions about own health care, X₁₃ Percentage of women's decisions about major household purchase, X₁₄ Attitudes towards wife beating, X₁₅ Attitudes towards Refusing Sexual intercourse with husband, X₁₆ Freedom of movement (allowed to go alone to all three places*), X₁₇ Current Use of Family Planning Methods, X₁₈ Institutional births

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