

Does Women's Empowerment Influence Multidimensional Poverty? Empirical Insight from Rural Odisha of India

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ABSTRACT

The prominent role played by women's empowerment and multidimensional poverty reduction in the development process is justified by including Goal-1 and Goal-5 under the 2030 agenda of UNDP's Sustainable Development Goals. This study examines the nexus between women's empowerment and multidimensional poverty in rural areas of the Jagatsinghpur district of Odisha. The Alkire-Foster method is used to construct Women Empowerment Index and Multidimensional Poverty Index. Education, health, economic, and standard of living dimensions construct MPI and economic, social, political, and domestic empowerment dimensions for WEI. This study observed that more than two-thirds of women are deprived of asset ownership and employment, and more than half of nutrition, access to improved sanitation, and clean energy for cooking. The results of the OLS model revealed the positive impact of women's empowerment with occupation, age, and education in reducing multidimensional poverty. Based on the findings, the study envisages appropriate policy intervention in enhancing the educational level and generation of self-employment opportunities in empowering women and reducing multidimensional poverty.

Keywords: Alkire-Foster methodology, multidimensional poverty, Odisha, OLS regression, women empowerment

ARTICLE INFO

Article history:

Received: 03 September 2021

Accepted: 07 September 2022

Published: 19 May 2023

DOI: <https://doi.org/10.47836/pjssh.31.2.08>

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ISSN: 0128-7702
e-ISSN: 2231-8534

INTRODUCTION

Poverty is widely recognised as a multidimensional phenomenon, reflected through many deprivations faced by the poor in their daily lives irrespective of their income levels, such as lack of basic education, poor health and nutrition, bad housing conditions, lack of improved sanitation and clean water, poor quality of work, disempowerment,

violence, social exclusion, and much more (“Policy—A multidimensional approach,” n.d.). Sustainable Development Goals (SDGs), the 2030 Agenda of the United Nations Development Programme (UNDP), is designed to end poverty, hunger, and discrimination against women and girls by using clean water, improved sanitation, and clean energy by all.

Empowerment, an expansion of freedom of choice and control over resources (Mason & King, 2001), is essential for women to strengthen their well-being through realising their identity, power, and position in all aspects of life (Allahdadi, 2011; Sahoo, 2013). Goal-5 of the SDGs includes gender equality and women empowerment as a precondition for reducing poverty, promoting sustainable development, and building good governance (Nandi, 2021). Gender equality and women’s empowerment in education, health, economic, social, and political domain plays a significant role in achieving sustainable and inclusive growth through the creation of human capital, boosting labour productivity, providing access to economic activities, and ameliorating poverty (Anggraeni et al., 2022; Jamil et al., 2022; Korosteleva & Stępień-Baig, 2020; P. K. Mishra, Mishra, & Sarangi, 2020; Sohail, 2014; Wei et al., 2021).

Odisha, an eastern Indian state, is sadly known to the world as a land of poverty despite its rich heritage, culture, and natural resources (Nayak, 2018). As per the National Multidimensional Poverty Index Baseline Report of India (National Institution for Transforming India [NITI

Aayog], 2021a), Odisha stands at the ninth position from the top among 28 Indian states in poverty with 29.35% of the population being multidimensionally poor, while in rural and urban Odisha it was estimated at 32.66% and 12.33%, respectively. Although the government implements numerous development programmes in the state to eradicate poverty and hunger, more than 70% of the population is still deprived of clean cooking fuel (80.94%) and improved sanitation (70.43%). More than half are deprived of better housing facilities (55.81%), more than one-third are deprived of nutrition (37.26%), and about 20% of the population are deprived of clean drinking water and asset ownership. Less deprivation is observed in respect of population having bank account (10.94%), child school attendance (4.95%), and child mortality (2.23%). The report also exhibit acuteness of rural multidimensional poverty in comparison to urban regions of the state.

The picture of gender equality and women’s empowerment in the state, as reflected through the National Family Health Survey-5, 2019–2021 (Government of India), provides mixed evidence. The performance of women is commendable in several indicators of empowerment, such as having a personal bank account (86.5%), knowledge of microcredit programme (74.4%), the decision taken by women alone or jointly with their husbands on how to use self-earning (91.6%) and their husbands earning (81.0%). The dark side of women’s empowerment in the state is observed in education, health, and economic

dimensions. About 90% of the women are deprived of reading the newspaper at least once a week, more than 70% of the women are unemployed as well as deprived of never using the internet, and more than half of the women are not covered under any health insurance scheme, ownership of the house and land property, and about half of the women deprived of five years of completed schooling. The gender disparity is more pronounced (greater than 25%) in respect of unemployment, people suffering from anaemia in the age group of 15-49, and owning a house alone or jointly in the age group of 15-49 (International Institute for Population Sciences & International Classification of Functioning, Disability and Health, 2021).

The existence of high gender discrimination along with multidimensional poverty in Odisha is evidenced through 2020–2021 SDG scores (NITI Aayog, 2021b). The state even failed to achieve the tag of the ‘performer’ (SDG score in the range of 50 to 64) and continues to remain in the ‘aspirant’ category (SDG score in the range of 0 to 49) in respect of SDG1-No Poverty (41), SDG2-Zero Hunger (42), SDG4-Quality Education (45), SDG5-Gender Equality (46), and SDG8-Decent Work (48; NITI Aayog, n.d.).

Against this backdrop, this piece of research work attempts to (1) assess the magnitude of women empowerment and multidimensional poverty in the rural areas of Odisha, (2) examine the impact of occupational structure, age, social group and education on women’s

empowerment, and (3) examine the impact of occupational structure, age, social group, education, and women’s empowerment on multidimensional poverty.

This study, using Alkire and Foster (2011) method and OLS based multiple regression model, evinced that more than two-thirds of the women in the study area are deprived of asset ownership and employment, and more than half are deprived of in nutrition, access to improved sanitation, and access to clean energy for cooking. The deprivation gap between multidimensionally poor and non-poor women concentrates on five indicators; i.e., completed years of schooling, nutritional status, access to improved sanitation, clean energy for cooking, and employment. The study also reveals the significant impact of the levels of education, age, occupational structure, and higher level of women empowerment on multidimensional poverty among women. This study is the first of its kind in the context of women’s empowerment and multidimensional poverty in the Jagatsinghpur district of Odisha, and thus, the novelty of the study is justified.

LITERATURE REVIEW

Women empowerment and gender equality are preconditions for sustainable development, economic growth, and poverty reduction (Thandar et al., 2019). The “Gender Efficiency Approach” advocates that women’s access to education, jobs, credits, and assets act as a catalyst in accelerating society’s development

and growth significantly, and therefore, gender equality is portrayed as “Smart Economics” (Robles, 2020). Although rural women contribute significantly to economies, whether in businesses or on farms, as entrepreneurs or employees, or by doing unpaid care work at home, they are still disproportionately affected by poverty, discrimination, and exploitation (“Economic empowerment”, n.d.). Despite most countries across the globe approaching towards achieving gender equality by increasing the proportion of school-going girls, decreasing girl’s early marriage, and increasing women’s participation in parliament, still, many challenges remain to persist, such as the presence of discriminatory laws and social norms, underrepresentation of women at all levels of political leadership, and physical or sexual violence by their intimate partner (United Nations, n.d.).

Dimensions of Women’s Empowerment

No household, society, or country can move forward without empowering its women (Express News Service, 2022). Gender discrimination in education, health, and employment hinders women from attaining a decent living standard, showing their incapability to control the economy’s resources (Madan & Gill, 2011). Empowerment provides rights to women to enhance their socioeconomic, political, and legal strength and subsequently helps in achieving gender equality in the field of education and employment, and provides

ample opportunities to live with respect, dignity, and self-worth (Kharel, 2021). Women’s empowerment is viewed as a multidimensional phenomenon that incorporates several dimensions, such as education, economic, social, familial, political, and psychological (Bayissa et al., 2018; Datta & Sahu, 2021, 2022; Ghosh, 2022; Khan et al., 2022; Mastoi et al., 2021; U. Riaz & Chaudhry, 2021; Solomon & Sharma, 2021; A. K. Tripathy, 2021; Vede, 2021). Empowered women support their families by raising their earnings, uplifting living standards, and fulfilling their needs, such as food, clothing, education, and good health (Sarwar & Chaudhury, 2021). They are also vigilant in health aspects to reduce child stunting, wasting, and underweight rates through their social independence and decision-making power (Onah, 2021). Educational empowerment upsurges women’s knowledge, skill, and self-confidence, provides better employment opportunities in the labour market, enhances earning capacity, and helps in participating in the development process (S. Riaz & Pervaiz, 2018; Abbas et al., 2021; Kalakoti, 2021; Sarfraz et al., 2021; A. K. Tripathy, 2021).

Women’s economic empowerment is critical for improving their self-confidence, self-image, and basic survival needs (Mohapatra, 2017). It enhances women’s access and control over economic resources, such as income, property, and financial assets like saving and investment (Datta & Sahu, 2021; Khan et al., 2022), and also promotes next-generation human

capital (King et al., 2008). Psychological empowerment enables women to participate in household decision-making processes, such as children's marriage, family savings, asset purchases, and visits to the maternal house (Datta & Sahu, 2021).

Social empowerment enhances women's autonomy and self-confidence to develop social relationships (Khan et al., 2022) and promotes gender equality by providing equal opportunities, rights, and obligations to women (A. K. Tripathy, 2021). Political empowerment enhances women's awareness of the voting practice, participation in the *panchayat*, participation in election campaigns, choice of candidate, and contest in the elections (Datta & Sahu, 2021; Ghosh, 2022; Khan et al., 2022; A. K. Tripathy, 2021). Women's participation in governance is also highly significant for navigating the socioeconomic disadvantage section of society to the mainstream (Divakar & Singh, 2022).

Dimensions of Gendered Poverty

Poverty is the pronounced deprivation of well-being in terms of education, health, housing, asset ownership (Biswal et al., 2020; P. K. Mishra, Kumar, et al., 2020; S. K. Mishra et al., 2021; Wei et al., 2021), employment (Biswal et al., 2020; P. K. Mishra, Kumar, et al., 2020), empowerment (Biswal et al., 2020; S. K. Mishra et al., 2021), social security (P. K. Mishra, Kumar, et al., 2020), and social relationship (Biswal et al., 2020; S. K. Mishra et al., 2021). Low educational attainment decreases women's capabilities to get better employment

opportunities and is accountable for deteriorating their socioeconomic living conditions (Ajala, 2016; Fabiyi & Akande, 2015). Economically deprived women fail to meet their household expenses for education, health, and other daily needs and survive under low living standards (Wrigley-Asante, 2008). Deprivation in good health restricts women from participating in different income-generating activities and creates an obstacle to caring for their family members and children's education (Delisle, 2008; Biswal et al., 2020). Deprivation in using clean cooking fuel and solid dirty fuel, such as cow dung, firewood, and straws, creates many health hazards for women and increases energy poverty (Abbas et al., 2021).

Education plays a vital role in enhancing the knowledge and skills of women, which further allows them to participate in different socioeconomic and political activities (Biswal et al., 2020). Educated women reduce their economic dependence by engaging themselves in different income-earning activities and subsequently help reduce poverty (Wei et al., 2021). The standard of living reflects the quality of life of the individuals. Acquiring different physical assets, such as mobile phones, television, refrigerator, fan, and motorcycle, provides mental peace, makes life more comfortable, and subsequently helps reduce multidimensional poverty (Wei et al., 2021).

Multidimensional poverty portrays the dominance of male-headed over female-headed households (Montoya & Teixeira, 2017). Female-headed households are more

deprived in consumption, health, education, and empowerment aspects of poverty (Kyaw & Routray, 2006). In the study relating to the feminisation of multidimensional poverty in rural Odisha, Biswal et al. (2020) observed that females are more deprived than males due to their low level of education and low freedom in taking household decisions and about half of the women are deprived of education, nutrition, and improved sanitation, three-fourths of the women were deprived of using clean cooking fuel, 95% of women were deprived in asset ownership, and almost all women were deprived in community-level activities.

Siddique and Nosheen (2021), in their study on multidimensional poverty among female-headed households, found that more than 80% of the household deprived of access to clean and safe water, and more than two-thirds of the household deprived of improved sanitation and asset ownership. In a cross-country analysis in Sub-Saharan Africa, Batana (2013) observed that women are highly deprived of education, followed by empowerment. In the study on the gendered nature of multidimensional poverty in China, Yichao and Di (2017) found that women are significantly more vulnerable than men in primary education, health, and nutrition.

In the study relating to multidimensional poverty among women in rural areas of South and Southeast Asia, Abbas et al. (2021) found that most women falling under the multidimensionally poor category were deprived of using clean energy for cooking, that compels them to use dirty

cooking fuels, which emits poisonous and harmful substances and consequently accountable for their health degradation. Bhattacharjee and Goswami (2021), in their study on multidimensional poverty among female domestic workers' households in the district of South 24 Parganas of West Bengal in India, found that about half of the households are multidimensionally poor due to their irregular income and unstable nature of work. Omotoso et al. (2022), in a study on multidimensional poverty in South Africa, found that most women fall into poverty due to deprivation in employment and health indicators.

Women's Empowerment and Gendered Poverty

Women are the drivers and beneficiaries of poverty eradication (Puri, 2017). They engaged in different self-employment activities, such as street vending and petty shopkeepers (Arora & Arora, 2012), rice vending, bamboo work, rope making and weaving (Mohanty et al., 2013), food processing, grocery, and handicrafts (U. Tripathy, 2015), poultry (Abebe & Tesfaye, 2017), and livestock (Alabi et al., 2019) can generate more income and helps in eradicating poverty. Provision of skill-enhanced training facilities to women engaged in different agricultural and non-agricultural income-generating activities in rural areas, such as vegetable production, nursery establishment, animal husbandry, poultry rearing, cleaning of seeds, and crops harvesting, play a vital role in women's empowerment and poverty reduction (P. Jena et al., 2021).

Self-help groups (SHGs) act as a panacea for women's empowerment and poverty reduction by providing economic independence and security to women by increasing their income level and assets (Arif, 2014; Galab & Rao, 2003; Illangakoon et al., 2021; S. Jena & Patro, 2016; Onyuma & Shem, 2005; Ravindra & Tiwari, 2016; Widiyanti et al., 201; Gu & Nie, 2021; U. Riaz & Chaudhry, 2021). The provision of microfinance increases women's capability to remove income poverty, basic needs poverty, capacity poverty, knowledge poverty, and information poverty and helps enhance the welfare of the family, community, and society (Mastoi et al., 2021). Adnan and Amri (2021) observed a unidirectional relationship between women empowerment and poverty reduction in a study in Western Indonesia. Wei et al. (2021) observed a significant contribution of women's empowerment on poverty reduction, i.e., a 1% increase in empowerment score leads to a 1.4% increase in per capita income and a 0.101% fall in multidimensional poverty. A similar observation was made by Ntenkeh and Fonchamnyo (2021) in Cameroon, where a 1% increase in women empowerment leads to a 0.176% fall in poverty.

The literature surveyed echoes the nature of gender disparity reflected through the higher deprivation of women in nutrition, health, and education. Further, women confront greater difficulties in the labour market that result in low earnings, a low living standard, and increased poverty. Women's empowerment positively contributes to

increasing per capita income and reducing income and multidimensional poverty. The study on women's empowerment and multidimensional poverty in rural areas is highly significant.

METHODS

Jagatsinghpur district is purposively taken as the sample district to study the status of women empowerment and multidimensional poverty and their interrelationship. The block wise map of Jagatsinghpur district of Odisha is given in Figure 1.

This district, although recognised as the second topmost non-poor district among 30 districts of the state in terms of multidimensional poverty (11.83% multidimensionally poor), people are still deprived in many indicators of multidimensional poverty, such as using improved sanitation (72.92%), improved housing facilities (54.77%), clean cooking fuel (49.86%), electricity connection (20.87%), nutrition (20.19%), and maternal healthcare (18.00%; NITI Aayog, 2021a). Even though the district's performance in most indicators of multidimensional poverty is better than the state, still the position of the district is worse in using improved sanitation, electricity connection to the household, and child and adolescent mortality rate (NITI Aayog, 2021a).

A multi-stage random sampling technique is used in the present study to collect information from each female member who belongs to the sample household in the age group between 15 and 64 from January to March 2021. In the first

stage, 32 villages are randomly selected using SPSS-23, four each from eight blocks under the Jagatsinghpur district. Rao-soft online sample size calculator is used to determine 370 sample households out of

8591, with a 5% margin of error and 95% confidence level. From each sample village, 4.31% of household is selected using a simple random sampling technique in the second stage (Table 1).

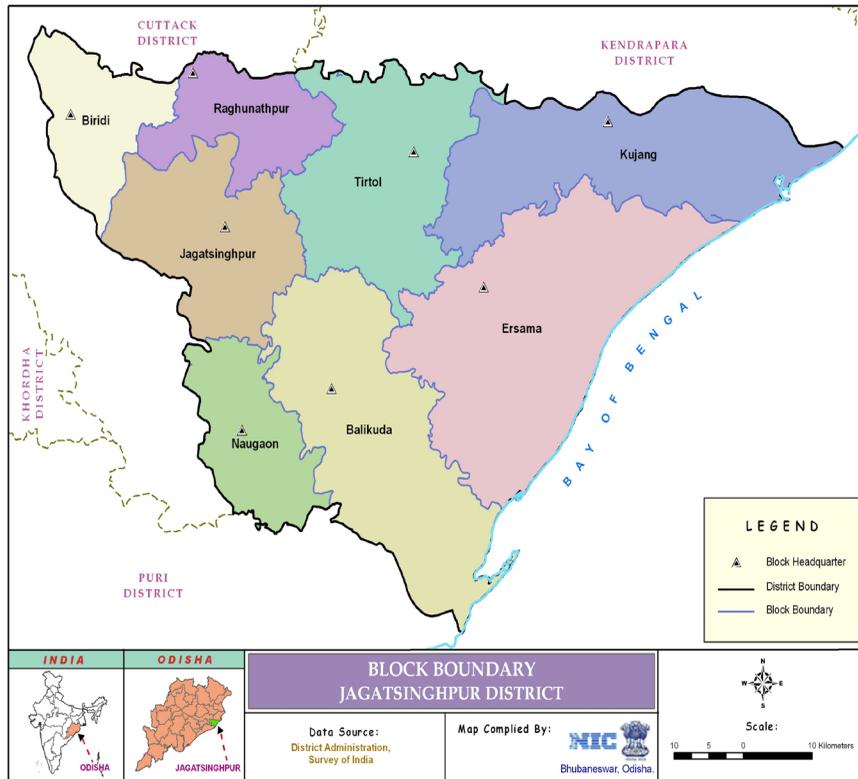


Figure 1: Block wise map of Jagatsinghpur district of Odisha

Table 1

Village-wise number of sample households

Name of the block	Name of the village	Total household size	Sample household size
Balikuda	Nagapur	465	20
	Khaleri	136	6
	Kalio	346	15
	Bhoda	220	9

Table 1 (Continue)

Name of the block	Name of the village	Total household size	Sample household size
Biridi	Ranipada	436	19
	Balia	321	14
	Chandapur	450	19
	Anakhia	22	1
Erasama	Siha	240	10
	Arada	94	4
	Bartol	112	5
	Botigaon	84	4
Jagatsingh-pur	Baruna	50	2
	Mahakale-swar	115	5
	Itapada	54	2
Kujanga	Palli	131	6
	Zillanasi	323	14
	Hasina	509	22
	Arakhia	303	13
Naugaon	Samagol	464	20
	Abadala-pur	108	5
	Erada	335	14
	Ghoda-nsa	351	15
Raghunath-pur	Tentoi	472	20
	Barti	161	7
	Tarapur	274	12
	Patenigaon	162	7
Tirtol	Jaisol	227	10
	Bishan-pur	573	25
	Manapur	290	12
	Nuagaon	270	12
	Kolta	493	21

Source: Authors' estimation from primary data

Alkire-Foster methodology (Alkire & Foster, 2011) is used in the study to construct MPI and WEI with appropriate modification. Four dimensions comprising ten indicators are considered for constructing MPI, and four dimensions comprising eight indicators for constructing WEI. The equal weightage is assigned to all dimensions and all indicators under each dimension for computing MPI and WEI (Table 2).

Table 2
MPI and WEI (dimensions, indicators, and weights)

Index	Dimension	Weight	Indicator	Symbol	Weight
MPI	Education	1/4	Completed years of schooling	EDN	1/4
	Health	1/4	Nutritional status	NUT	1/8
			Vaccination	VAC	1/8
	Economic	1/4	Employment	EMP	1/4
			Access to electricity	ELCT	1/24
			Access to safe drinking water	WAT	1/24
	Living Standard	1/4	Access to clean energy for cooking	ENR	1/24
			Housing condition	HOU	1/24
			Access to improved sanitation	SAN	1/24
			Asset ownership	ASET	1/24
WEI	Economic empowerment	1/4	Individual land ownership	LAN	1/8
			Possession of individual bank a/c	BANK	1/8
			Participation in community-level activities	PARCOM	1/12
	Social empowerment	1/4	Organization of community-level activities	ORGCOM	1/12
			Autonomy in changing things at community-level	AUTCOM	1/12
	Political Empowerment	1/4	Participation in parliament, legislative assembly, or other political institutions	POL	1/4
	Domestic empowerment	1/4	Autonomy in healthcare decisions	AUTHTH	1/8
			Autonomy to prevent domestic crime/violence	AUTPRVCR	1/8

Source: Authors' estimation from primary data based on Alkire and Foster's (2011) approach

Individual deprivation score is computed using the equation $C_i = w_1h_1 + w_2h_2 + \dots + w_ih_i$, where C_i indicates the individual index value for measuring multidimensional poverty, w_i is the weight assigned to i^{th} indicator, and h_i indicates the deprivation in the component indicator. If an individual is deprived in the i^{th} indicator, then $h_i = 1$ and for non-deprived, $h_i = 0$. Individual deprivation score for measuring multidimensional poverty varies between '0' and '1', where '0' indicates non-deprivation and '1' indicates complete deprivation in all the indicators under consideration.

Similarly, the women empowerment score is computed using the equation $C_j = w_1h_1 + w_2h_2 + \dots + w_jh_j$, where C_j indicates the individual index value for measuring women empowerment, w_j is the weight assigned to j^{th} indicator, and h_j indicates the disempowerment in the component indicator. If an individual is empowered in the j^{th} indicator, then $h_j = 1$ and for disempowered, $h_j = 0$. Individual deprivation score for measuring women empowerment varies between '0' and '1', where '0' indicates fully disempowered and '1' indicates fully empowered in all the indicators under consideration.

An individual is deprived in the education dimension of multidimensional poverty if she has not completed a minimum of six years of schooling; in the health dimension if (1) her BMI is less than 18.5 (underweight) and greater than or equal to 23 (overweight and obesity), and (2) not vaccinated for any type of contagious diseases; in the economic dimension if not employed; in the standard of living dimension if she has no access to electricity,

improved sanitation facilities, clean drinking water, better housing condition, and not owned motor vehicle.

An individual is disempowered in the economic dimension of women empowerment if she has not possessed any hectare of agricultural/residential land and has no bank account; in the social dimension, if she has no autonomy to change things at the community level and fails to organise or participate in different community-level activities; in the political dimension if she has not elected to any type of political institutions starting from village to national level; domestically disempowered if she fails to control domestic violence and unable to take any type of healthcare decision at the household level.

A cut-off is used to identify whether an individual is multidimensionally poor or not. In this study, an individual with an MPI score below 20% is treated as multidimensionally non-poor (MDNP); between 20% and 33.33% as vulnerable to multidimensionally poor (VMDP); between 33.33% and 50% as multidimensionally poor (MDP); and 50% or higher as severely multidimensionally poor (SMDP).

Similarly, a cut-off level is also used to identify different categories of women's empowerment. Since no accepted threshold level is found in the literature, the same is estimated considering the WEI is normally distributed as tested through one sample Kolmogorov-Smirnov Test (Levin et al., 2017) with test statistics 0.301 (at 0.000 significance level). The cut-off points for a probability of 33.33% and 66.67% are estimated at 0.2239 and 0.3409, respectively.

Thus, an individual with a WEI score of ‘0’ is treated as “Zero Empowerment”, between ‘0’ and ‘0.2239’ is treated as “Low Empowerment”, between ‘0.2239’ and ‘0.3409’ as “Moderate Empowerment”, and more than ‘0.3409’ as “High Empowerment”.

The Chi-square Test of independence is used to study whether different categories of multidimensional poverty or women’s empowerment are independent of occupation, age, social group, and education.

The ordinary Least Square (OLS) based multiple regression model is used in the study to analyse the impact of different socioeconomic and demographic variables on women’s empowerment and multidimensional poverty. Since the dependent variables, i.e., WEI and MPI, are continuous, following the works of distinct researchers, such as Ogutu and Qaim (2019), Onoja et al. (2022), Sulaimon (2020, 2022), and Wei et al. (2021), this study also applied OLS based multiple regression model for impact analysis of women’s empowerment and multidimensional poverty. This study assesses the nature and magnitude of the relationship between (1) WEI and different categories of occupation (OCC), age (AGE), social group (SOC), and education (EDU),

and (2) MPI and different categories of occupation (OCC), age (AGE), social group (SOC), education (EDU) and women empowerment (WE). The specified two econometric models are as follows:

$$WEI = \alpha_1 + \beta_1 OCC + \beta_2 AGE + \beta_3 SOC + \beta_4 EDU + \varepsilon_i \quad (1)$$

$$MPI = \alpha_2 + \beta_5 OCC + \beta_6 AGE + \beta_7 SOC + \beta_8 EDU + \beta_9 WE + \varepsilon_j \quad (2)$$

where, α_1 and α_2 are constant, β_1 to β_9 represent coefficients of independent variables, and ε_i and ε_j are the error terms.

RESULTS AND DISCUSSIONS

Sample Characteristics

The study is based on responses from 583 women from 370 sample households aged 15 to 64. Nearly 60% of women are in the age group 35–54. Only 5% of women under study are illiterates. 57% of women have educational qualifications up to the secondary level (Table 3). Women with graduation and above constitute 20.41% of total women. Women belonging to SEBC dominate the social group category. Under the occupational category, 78.39% of the sample respondents are unemployed, and 14.75% are self-employed.

Table 3
Sample profile

	Item	Female respondent (number)	Percentage (%)
Occupation	No work	457	78.39
	Daily wage earner	21	3.60
	Private job	5	0.86
	Government job	14	2.40
	Self-employed	86	14.75

Table 3 (Continue)

	Item	Female respondent (number)	Percentage (%)
Age (years old)	15–24	68	11.66
	25–34	89	15.27
	35–44	177	30.36
	45–54	171	29.33
	55–64	78	13.38
Social group	OBC	114	19.55
	SC	67	11.49
	SEBC	360	61.75
	UR	42	7.20
Education	Illiterate	29	4.97
	Lower primary	107	18.35
	Upper primary	106	18.18
	Secondary	119	20.41
	Higher secondary	103	17.67
	Graduation & above	119	20.41

Source: Authors' estimation from primary data

Women Empowerment

A close look at the women empowerment in the study area reveals that the percentage of women observed in zero, low, moderate, and high empowerment groups are 5.66, 17.32, 36.36, and 40.65, respectively. More than 93% of women lack social and political empowerment, and above 87% face economic disempowerment, particularly in land ownership (Table 4). Even more than 97% of women in the high empowerment group are disempowered in organising community-level activities, autonomy in changing things at the community level, and participation in Parliament, Legislative

Assembly, or other political institutions. Lower educational achievements of women, the patriarchal nature of the rural social structure, and pervasive poverty restrict women's mobility in the public space and their social and political participation.

The study observed a lower level of patriarchal forms of violence women face, where only 1 out of 4 women in the age group 15 to 64 years are disempowered to prevent crime/violence in the household. However, their domestic empowerment does not help in making healthcare decisions on the domestic front.

Table 4

Indicator-wise women's empowerment and disempowerment

Dimension	Indicators	Not empowered (%)	Empowered (%)
Economic empowerment	LAN	87.65	12.35
	BANK	21.27	78.73
	PARCOM	99.66	0.34
Social empowerment	ORGCOM	93.83	6.17
	AUTCOM	98.97	1.03
Political empowerment	POL	99.83	0.17
Domestic empowerment	AUTHTH	45.80	54.20
	AUTPRVCR	25.39	74.61

Source: Authors' estimation from primary data

The status of women's empowerment is studied across occupation, age, social group, and educational level of women (Table 5). The study, using the Pearson chi-square test observed a significant association of women empowerment with occupation, age,

and educational level of women (p -value < 0.05), and no significant association with the social group (p -value > 0.05). About 97% of zero empowered women are non-workers. Women in private or government jobs are either moderately or highly empowered.

Table 5

Women empowerment across occupation, age, social group and education

Item	Empowered women (%)				Pearson chi-square (p -value)	
	Zero	Low	Moderate	High		
Occupation	Unemployed	96.97	82.18	75.00	77.22	28.492* (0.005)
	Daily wage earner	3.03	3.96	4.25	2.95	
	Private job	0.00	0.00	0.94	1.27	
	Government job	0.00	0.00	0.47	5.49	
	Self-employed	0.00	13.86	19.34	13.08	
Age (years old)	15–24	51.52	24.75	8.96	2.95	120.114* (0.000)
	25–34	36.36	17.82	15.09	11.39	
	35–44	6.06	24.75	28.30	37.97	
	45–54	6.06	17.82	34.91	32.49	
	55–64	0.00	14.85	12.74	15.19	

Table 5 (Continue)

Item	Empowered women (%)				Pearson chi-square (<i>p</i> -value)	
	Zero	Low	Moderate	High		
Social group	OBC	15.15	20.79	24.06	15.61	10.478 (0.313)
	SC	21.21	11.88	11.79	9.70	
	SEBC	54.55	59.41	57.55	67.51	
	UR	9.09	7.92	6.60	7.17	
Education	Illiterate	3.03	7.92	6.60	2.53	47.073* (0.000)
	LP	12.12	18.81	22.17	15.61	
	UP	0.00	11.88	23.11	18.99	
	Sec.	27.27	15.84	24.53	17.72	
	High Sec.	27.27	21.78	13.21	18.57	
	Grad. & above	30.30	23.76	10.38	26.58	

Note. *Significance at 1% level of probability

Source: Authors' estimation from primary data

Zero empowered women are concentrated in ages 15 to 34 (87.88%), whereas moderate and high empowerment concentration is observed in the age group between 35 and 54 (more than 63%). More than 84% of zero-empowered women have at least secondary-level educational qualifications, whereas the figure is about 60% for low and highly-empowered women.

OLS-based dummy variable multiple regression model is applied to assess the impact of occupation, age, and level of education on women's empowerment (Table 6). The social group is opted out of the regression model since the chi-square test disproves an association between women empowerment and social group. The reference groups consist of 'Age (15–24)' under variable 'Age', 'Unemployed' under variable 'Occupation', and 'Illiterate'

under variable 'Education'. A statistically significant 'F' ratio shows a good model fit. The three categorical variables combined explain about 28% change in women's empowerment. The study witnessed the positive contribution of age and educational level in enhancing women's empowerment. Women become highly empowered with an increase in their age and educational level. Only the impact of government jobs on women's empowerment is found statistically significant, where the WEI increases by 0.142 for the women in a government job compared to unemployed women.

The study observed increased women empowerment with the increase in the age group. About 38.2% of women aged 15–24 enjoy autonomy in health care decisions, which increases to 62.7% for those aged 35–44. Similarly, 39.7% of women in the

age group 15–24 have the autonomy to prevent crime/violence in the household, which increases with the increase in age group and reaches 82.1% for the age group 55–64. It is also observed that ownership of land increases with an increase in age—from 3.4% in the age group 15–24 to 24.4% in

the age group 55–64. Women's autonomy in health care decisions increases with the increase in educational level, i.e., 44.8% for illiterate women and 71.4% for women with educational qualifications of graduation and above.

Table 6

Impact of socioeconomic and demographic variables on women's empowerment

Variables	Coefficient	Std. error	t-stat.	p-value
Constant	0.018	0.031	0.588	0.557
Age (ref: 15 – 24 years)				
Age (25–34) dummy	0.090*	0.019	4.812	0.000
Age (35–44) dummy	0.183*	0.017	10.547	0.000
Age (45–54) dummy	0.199*	0.019	10.615	0.000
Age (55–64) dummy	0.219*	0.023	9.712	0.000
Occupation (ref: unemployed)				
Daily wage dummy	0.021	0.028	0.764	0.445
Private job dummy	0.064	0.053	1.204	0.229
Government job dummy	0.142*	0.033	4.358	0.000
Self-employment dummy	0.017	0.014	1.251	0.211
Education (ref: illiterate)				
Lower primary education dummy	0.056**	0.025	2.226	0.026
Upper primary education dummy	0.086*	0.027	3.247	0.001
Secondary education dummy	0.093*	0.027	3.439	0.001
Higher secondary education dummy	0.116*	0.028	4.068	0.000
Graduation & above dummy	0.166*	0.029	5.684	0.000
F ratio (significance)		16.841* (0.000)		
R square		0.278		
Std. error		0.1144		

Note. WEI as the dependent variable; *, ** significance at 1% and 5% level of probability, respectively

Source: OLS estimation from primary data

Multidimensional Poverty

The Millennium Development and the Sustainable Development Goals emphasised the role of women's empowerment and the importance of multidimensional poverty in achieving sustainable development in a country. Different researchers' study on the gendered nature of multidimensional poverty, indicates women's vulnerability to men. This study tries to supplement the literature by studying multidimensional poverty among women in rural Odisha.

Deprivation of women across different indicators shows that almost all women are not deprived of indicators such as vaccination, access to safe drinking water, and access to electricity (Table 7). This result reflects the awareness of women regarding the positive contribution of vaccination, the use of safe and clean drinking water on the health of the family members and the successful execution of vaccination programmes and programmes relating to the supply of safe and clean drinking water and electricity by the government in the rural areas of the state.

The study observed that the deprivation gap between multidimensionally poor and non-poor women concentrates on five indicators, viz., completed years of schooling (46.24%), nutritional status (41.18%), access to improved sanitation (32.62%), access to clean energy for cooking (40.13%), and employment (39.84%).

The wide deprivation gap in a completed year of schooling is also reflected in the position of the women (about one-third) having 10 or more years of schooling

in the state (Planning and Convergence Department, 2021). The preferential attitude of parents towards the education of their son and the engagement of girls in household activities providing space for mothers to be engaged in economic activities, especially in poor households, are the major reasons for the deprivation of women on the educational front.

Women are still adopting the age-old practices of using traditional cooking fuels such as firewood and cow-dung cakes (about 70%) and practising open defecation (about 50%) despite the operation of government programmes/schemes like 'Pradhan Mantri Ujjwala Yojana (to make clean cooking fuel available to the rural and deprived households) and Swachh Bharat Mission (to eliminate open defecation and improve solid waste management) in the village, upholding the findings of Bagli and Tewari (2022) in their study in Purulia district of West Bengal. The study also observed that about 61.18 % of women possessing LPG still use dirty fuel for cooking. High refilling costs of LPG and easy access to other low-cost solid fuels are observed to act as the major obstacles to using clean cooking fuel. Although women in the study area value LPG more than other household commodities, lack of control over household expenditure decisions is the other reason for the low use of LPG. The study also witnessed that about 41.46% of women with access to flush toilets and latrines are going for open defecation, suggesting the failure of widespread subsidised latrine construction efforts made by the government

Table 7

Indicator-wise deprivation status of women across different levels of multidimensional poverty

Indicator	Not Deprived (%)	Deprived (%)	MDNP with poverty cut-off 0.3333 (Deprived %)	MDP With poverty cut-off 0.3333 (Deprived %)
Completed year of schooling	63.12	36.88	0.00	46.24
Vaccination	100.00	0.00	0.00	0.00
Nutritional status	45.97	54.03	21.19	62.37
Housing condition	89.71	10.29	7.63	10.97
Access to safe drinking water	100.00	0.00	0.00	0.00
Access to electricity	99.66	0.34	0.00	0.43
Access to improved sanitation	49.40	50.60	24.58	57.20
Access to clean energy for cooking	30.70	69.30	37.29	77.42
Asset ownership	4.46	95.54	84.75	98.28
Employment	21.61	78.39	46.61	86.45

Note. MDP—Multidimensionally Poor; MDNP—Multidimensionally Not Poor

Source: Authors' estimation from primary data

in the region to meet their objectives. Half-hazard construction of latrines, construction of latrines without bathing facilities, and the preference of rural people towards open defecation are the important reasons for the limited use of available latrines.

The deprivation status of women across the different occupational groups, ages, social groups, and education are presented in Table 8. Economic empowerment is important for women to achieve their potential and advance their rights. Engagement in any economic activity improves the economic base of women and the family. Increased income helps women to have access to an improved standard of living and come out of deprivation. However, the study's outcome reveals that about 78% of women

are deprived of employment, supporting the studies made by Bhattacharjee and Goswami (2021) and Omotoso et al. (2022). More than 90% of women categorised under SMDP are unemployed. Women are mostly engaged in the unregulated and unsecured informal sector. Only 62.79% and 30.23% of non-poor women are self-employed and engaged in government service, respectively. In a patriarchal culture, women are confined to household activities and find no time to engage in any economic activity. With the increases in age, household activities are passed on to younger female members, and the women in the higher age group are taking up some income-generating activities like dairy farming, goat rearing, and small business. The study observed a

Table 8

Multidimensional poverty across occupation, age, social group and education

		MPI Group (%)				Pearson chi-square (<i>p</i> -value)
		Non- poor	Vulnerable to MDP	MDP	Severe MDP	
Occupation	Unemployed	0.00	82.18	85.31	90.91	286.322* (0.000)
	Daily wage earner	0.00	4.00	3.95	3.41	
	Private job	6.98	0.00	1.13	0.00	
	Government job	30.23	0.36	0.00	0.00	
	Self-employed	62.79	13.45	9.60	5.68	
Age (years old)	15–24	2.33	7.27	19.21	14.77	274.722* (0.000)
	25–34	18.60	7.64	24.86	18.18	
	35–44	41.86	8.73	51.98	48.86	
	45–54	27.91	49.45	3.95	18.18	
	55–64	9.30	26.91	0.00	0.00	
Social group	Obc	30.23	22.55	14.69	14.77	12.364 (0.194)
	Sc	13.95	10.18	11.86	13.64	
	Sebc	44.19	61.09	65.54	64.77	
	Ur	11.63	6.18	7.91	6.82	
Education	Illiterate	0.00	10.18	0.00	1.14	183.574* (0.000)
	Lower primary	0.00	26.91	3.39	30.68	
	Upper primary	6.98	23.27	6.21	31.82	
	Secondary	23.26	17.45	27.12	14.77	
	Higher secondary	25.58	12.73	26.55	11.36	
	Graduate and above	44.19	9.45	36.72	10.23	

Note. *Significance at 1% level of probability

Source: Authors' estimation from primary data

statistically significant association between occupational category and multidimensional poverty as exhibited by *p*-value of the Pearson Chi-square test (0.000) which is less than 0.05.

Further, the Pearson Chi-square test reveals a statistically significant association between multidimensional poverty and age (*p*-value < 0.05). Nearly 80% of non-poor

women are above 35 years of age, whereas more than 80% of women suffering from severe multidimensional poverty are less than 45 years. No women within the age group 55–64 are either multidimensional poor or severely multidimensional poor.

No significant association is observed between multidimensional poverty and social group (*p*-value of Pearson Chi-square

test > 0.05). However, multidimensional poverty is significantly associated with educational level. None of the women in the non-poor category is illiterate or has an educational level up to lower primary. As regards women in the non-poor category, 93% have the educational level of secondary education and above. On the contrary, only 36.36% of severely multidimensionally poor women have an educational level of secondary and above.

Women empowerment significantly alleviates multidimensional poverty (Bhoganadam et al., 2014; Sahoo, 2013; Wei et al., 2021). The present study finds a significant relationship between multidimensional poverty and women empowerment and other variables like

occupation, age, and education. Since no significant relationship exists between multidimensional poverty and social group, as observed from the chi-square test, this variable is dropped in the regression model.

OLS-based dummy variable multiple regression model is undertaken with MPI as the dependent variable and occupation, age, education, and women empowerment as the independent variables. 'Age (15–24)' under the variable 'Age', 'Unemployed' under the variable 'Occupation', 'Illiterate' under the variable 'Education' and 'Zero Empowerment' under the variable 'Women Empowerment' are taken as reference groups in the regression model. The result of the dummy variable regression analysis is given in Table 9.

Table 9

Impact of socioeconomic and demographic variables on multidimensional poverty

Variables	Coefficient	Std. error	t-stat.	p-value
Constant	0.7635*	0.025	29.964	0.000
Age (ref: 15–24 years)				
Age (25–34) dummy	-0.0380*	0.014	-2.688	0.007
Age (35–44) dummy	-0.0507*	0.014	-3.630	0.000
Age (45–54) dummy	-0.0456*	0.015	-3.007	0.003
Age (55–64) dummy	-0.0567*	0.018	-3.152	0.002
Occupation (ref: unemployed)				
Daily wage Dummy	-0.2296*	0.020	-11.312	0.000
Private job dummy	-0.2650*	0.039	-6.805	0.000
Government job dummy	-0.2833*	0.024	-11.729	0.000
Self-employment Dummy	-0.2406*	0.010	-23.439	0.000
Education (ref: illiterate)				
Lower primary education dummy	-0.0177	0.019	-0.947	0.344
Upper primary education dummy	-0.0953*	0.020	-4.808	0.000
Secondary education dummy	-0.2971*	0.020	-14.764	0.000
Higher secondary education dummy	-0.3110*	0.021	-14.606	0.000
Graduation & above dummy	-0.3354*	0.022	-15.134	0.000

Table 9 (Continue)

Variables	Coefficient	Std. error	t-stat.	p-value
Women empowerment (ref: zero empowerment)				
Wei (low) dummy	-0.0007	0.018	-0.039	0.969
Wei (moderate) dummy	-0.0023	0.017	-0.132	0.895
Wei (high) dummy	-0.0319**	0.018	-1.821	0.069
F ratio	125.718* (0.000)			
R square	0.780			
Std. error	0.0843			

Note. MPI as the dependent variable; *, ** significance at 1% and 10% level of probability, respectively
Source: OLS estimation from primary data

The regression model applied in the study is statistically significant at a 1% significance level. The four variables taken together explain nearly 77.4% variation in multidimensional poverty. Statistically, a significant relationship is observed between MPI, and all dummy variables are taken under age, occupational groups, and education (except the dummy variable 'Lower Primary'). The significant contribution of women's empowerment in influencing multidimensional poverty is observed only for the higher empowered group.

All dummy variables are inversely related to MPI as reflected by the negative sign of regression coefficients indicating the positive influence of age, occupation, education, and women empowerment in reducing multidimensional poverty. With the increase in age, women are engaged in different productive activities and are more empowered in society, which extends their capabilities to other domains of functioning such as education, health, and better living conditions.

Regression coefficients relating to different educational groups indicate the positive and increasing influence of education level in plummeting multidimensional poverty. Increased educational level enhances the skills and knowledge of women and their employability. All these positively impact women's earning capacity, which helps reduce the deprivation in other dimensions of multidimensional poverty. The increased educational level of women empowers them to make their own healthcare decisions and the healthcare of their children and other family members. This observation of the study supports the finding of the work undertaken by Wei et al. (2021).

The study also observed the positive contribution of women's employment in reducing multidimensional poverty. Women's engagement in any economic activity, other things remaining constant, reduced the MPI score minimum by 0.2296. It corroborates the study carried out by Abebe and Tesfaye (2017), Acharya and Samantray (2013), Alabi et al. (2019), Arora

and Arora (2012), P. Jena et al. (2021), Mohanty et al. (2013), and U. Tripathy (2015).

An attempt is made to project the position of women in different poverty levels based on the results obtained in the regression analysis, each for zero empowered women (Table 10) and high empowered women (Table 11) across different occupation and educational levels.

The projected coefficients indicate that the poverty level decreases with an increase in educational level across all occupational categories. Women engaged in any economic activity with the educational level of graduation and above and with the educational level of higher secondary and engaged in private or government jobs are projected as non-poor.

Table 10

Projected multidimensional poverty status of zero empowered women across education and occupation

	Illiterate	Upper primary	Secondary	Higher secondary	Graduation and above
Unemployed	0.764	0.668	0.466	0.453	0.428
Daily wage	0.534	0.439	0.237	0.223	0.199
Private job	0.499	0.403	0.201	0.188	0.163
Government job	0.480	0.385	0.183	0.169	0.145
Self-employment	0.523	0.428	0.226	0.212	0.188

Note. SMDP—Severely Multidimensionally Poor (projected score 0.5 and above), MDP—Multidimensionally Poor (projected score between 0.333 and 0.5), VMDP—Vulnerable to Multidimensionally Poor (projected score between 0.2 and 0.333), and MDNP—Multidimensionally Not Poor (projected score below 0.2)

Source: Authors' projection based on OLS Estimation

Table 11

Projected multidimensional poverty status of highly empowered women across education and occupation

	Illiterate	Upper primary	Secondary	Higher secondary	Graduation and above
Unemployed	0.732	0.636	0.435	0.421	0.396
Daily wage	0.502	0.407	0.205	0.191	0.167
Private job	0.467	0.371	0.170	0.156	0.131
Government job	0.448	0.353	0.151	0.137	0.113
Self-employment	0.491	0.396	0.194	0.180	0.156

Note. SMDP—Severely Multidimensionally Poor (projected score 0.5 and above), MDP—Multidimensionally Poor (projected score between 0.333 and 0.5), VMDP—Vulnerable to Multidimensionally Poor (projected score between 0.2 and 0.333), and MDNP—Multidimensionally Not Poor (projected score below 0.2)

Source: Authors' projection based on OLS Estimation

A very encouraging observation is witnessed in Table 11. Suppose any policy intervention helps a woman to become highly empowered and enables her to be engaged in any economic activity. In that case, she will be considered multidimensionally non-poor even with an educational level of secondary education. It indicates the role of education and women's empowerment in reducing multidimensional poverty.

CONCLUSION

This study is the first to analyse the status and determinants of women's empowerment and multidimensional poverty in rural Odisha. The major findings of the study concentrate on (1) the presence of a high level of social and political disempowerment among rural women, (2) the existence of high deprivation gap between multidimensionally poor and non-poor women in completed six years of schooling, nutritional status, access to improved sanitation and clean cooking fuel, and employment, (3) the positive contribution of age and education in enhancing women empowerment, and (4) the impact of self and wage employment, education, and high women empowerment on reduction of multidimensional poverty.

Although the participation of women in rural local governments (*Panchayati Raj*) has increased after the enactment of the Odisha Panchayat Laws (Amendment) Act, 2011 in enhancing the quota for women from 33 to 50% in *Grama Panchayats*, *Panchayat Samities*, and *Zilla Parishads*, still women's are highly disempowered in political front, in the study area. It is

expected that rural women's educational and economic empowerment through strengthening their capabilities and self-reliance will accelerate the political and social empowerment.

High refuelling price of LPG and the inability of women to influence the household decision stands against the use of clean cooking fuel. With women's economic and domestic empowerment, it is expected that they can influence the household decision to go for clean cooking fuel. Further, the study observed high level of open defecation results in high incidence of deprivation in sanitation. Creation of awareness among women for large scale use of household latrines will lessen the level of multidimensional poverty among rural women in the state.

The study observed the positive role played by women's empowerment and their engagement in any economic activity in reducing multidimensional poverty among rural women. This calls for policy intervention in empowering women through vocational and skill-based education for girls at the secondary level of education and economic empowerment through various training programmes in uplifting their employability skills. The introduction of the gender equality programme in over 20,000 Government schools to integrate a gender equity curriculum into the syllabus for students is a right step by Govt. of Odisha in enhancing educational empowerment among women.

The government of Odisha has adopted the "Odisha State Policy for Girls and Women

2014” to create an enabling environment for the empowerment of girls and women in enhancing their capacities and eliminating discrimination. The State Government, through “Mission Shakti,” is endeavouring to enhance women’s empowerment in the state. SHGs have provided easy capital for agro-based and other economic activities like bamboo crafts, incense sticks making, candle making, and dairy and goat rearing. Still, the SHGs operating in rural areas face a major problem in marketing their products. Therefore, widening marketing channels for the products produced by SHGs will uplift economic conditions of the rural women.

The commitment of the state government in empowering women is asserted in the statement “from rolling out Mission Shakti for women empowerment in 2001 to reserving 33% for women in parliament in 2019, as an attempt to address the underrepresentation of women in the political space, Odisha government has continually putting efforts to make Odisha a land of equal opportunities” (Planning and Convergence Department, 2022, p. 376). It is expected that the state government’s commitment will be realised in its true spirit to empower rural women and helps them to overcome the barriers to reduce the multidimensional poverty in the state.

ACKNOWLEDGEMENT

We sincerely acknowledge the suggestions of anonymous referees and editors of the journal for their valuable comments, which were instrumental in bringing out this article. The authors also acknowledge the

financial support received from Siksha ‘O’ Anusandhan (Deemed to be University), Bhubaneswar, Odisha, India, for the publication of this article.

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