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RESEARCH

Microfinance and women's empowerment: sequential mediation of economic and social outcomes on decision-making ability

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Abstract
Microfinance plays a crucial role in enhancing economic growth, social development, and women's empowerment of Self-Help Group (SHG) women, ultimately contributing to their decision-making ability and overall well-being. This study investigates the effect of sequential mediation of economic and social outcomes on the decision-making abilities of these women. Data was collected from 306 SHG women residing in villages near Pink City, Jaipur, Rajasthan (India), all registered members of the NGO Pitambara Foundation, using purposive sampling. The study employed Exploratory Factor Analysis (EFA) followed by Confirmatory Factor Analysis (CFA) and Covariance-Based Structural Equation Modelling (CB-SEM) using AMOS to test the hypotheses. Results suggest that the influence of microfinance on decision-making is primarily mediated by improvements in economic and social outcomes rather than being a direct result of accessing financial services alone. Policymakers and SHG programme designers should strengthen microfinance interventions by integrating skill development, health awareness, and social empowerment components alongside credit access, to maximise women's decision-making ability and household well-being. This further strengthens their role within their families as well as communities at large. This research contributes to financial inclusion literature by enhancing the generalizability of the proposed framework and informing policy decisions for sustainable economic and social development.

Keywords Microfinance · Self-help group · Social outcome · Economic outcome · Decision-making · Sequential mediation analysis

JEL Classification O12 · G21 · D91

Background

Over the past decades, microfinance has significantly impacted women's economic and social empowerment, particularly when combined with the Self-Help Group (SHG) model (Datta and Sahu 2021, 2022a, 2022b; Bhaskar and Yadav 2025). It provides access to finance, promotes the importance of savings, and encourages skill development to promote women's physical and mental well-being (Hazra et al., 2019; Maîtrot, 2021; Nichols, 2021). Microfinance initiatives help boost the confidence of SHG women and achieve social empowerment, further improving their decision-making ability. Past research in this field highlights the ability of microfinance to transform the lives of underprivileged women through poverty alleviation and improving their overall well-being. Efforts should be made to improve the outreach of these microfinance programs to the most vulnerable sections of society (Hietalahti & Linden, 2006; Karlan & Zinman, 2009).

Studies of various microfinance programs disclose that the majority of studies measuring the effectiveness of these programs find a negligible impact on women's decision-making capacity, underscoring the intricacies of women's empowerment within financial inclusion initiatives (Holvoet, 2005; Mehta et al., 2020; Brody et al., 2015; Kochar et al., 2022; Raghunathan et al., 2022). While microfinance

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programs often target women to empower them economically and socially, their impact on decision-making within households or society may not always be straightforward (Brody et al.,2015; Raghunathan et al., 2022).

Gender-responsive finance was the only transformative solution for the challenges faced by women. Microfinance programs and support from SHG proved to be the most reliable and reasonable way out (Baland et al., 2011). These programs worked towards inclusivity and equality to empower women and bring about economic development in the region (Holvoet, 2005; Maîtrot, 2021; Pandhare et al., 2024).

The current research tries to prove that gender-responsive finance through microfinance initiatives provided by Self Help Groups helps in promoting economic equality and inclusivity, which this study defines as economic output, encompassing variables such as income enhancement (IE), financial independence (FW), and an improved standard of living (EC). It also contributes to social empowerment, measured through variables like social status (SE), improvements in mental and physical health (MPH), and advancements in social interaction (SI). Economic output and social output contribute towards women's decision-making ability.

Economic output and empowerment can help close the gender gap and bring about inclusive growth (Hoffmann et al., 2020). Financial products should be tailored in such a way that they meet the unique needs of Self-help group women. Collective efforts from government, financial institutions, and society can develop a unique financial system that will work towards understanding and meeting the distinct requirements of women, including credit, banking and other financial services, to transition from small-scale income-generating activities to sustainable businesses (Mathur & Agarwal, 2017).

It is important to know that widespread economic empowerment can be achieved not only through access to finance but also through the need to eradicate systematic societal barriers, such as women's right to education, gender discrimination, legal rights, etc. and bring about social outcomes (Maîtrot, 2021). Gender-responsive strategies should prioritise sustainable development and gender equality by promoting policies such as equal pay, providing childcare facilities to underprivileged working women and providing facilities to market their products as they have limited market access (Wellalage & Thrikawala, 2021; Kabeer et al., 2008).

Apart from providing credit facilities, education and SHG-based skill development also generate an inclusive framework for empowering women (Joseph, 2013). These prove to be pillars of economic and social output, which can further impact the decision-making ability of SHG women. Economic output can be enhanced by improving income levels, financial independence, and better living standards. Concurrently, they drive social output by boosting women's social status, improving mental and physical health, and enabling meaningful social interactions. These changes not only empower women as individuals but also strengthen their roles in their households and communities, creating a ripple effect of progress and inclusion (Mathur & Agarwal, 2017). This all-inclusive approach can enable women to have control over their social surroundings by bringing about development in their business, i.e. transitioning from smaller businesses to more sustainable ones (Quan-Baffour, 2012).

There is a wide range of research available in the field of microfinance and SHG. However, hardly any existing study has examined the mediating effect on women's decision-making ability through sequential economic and social outcomes. The existing literature focuses only on the direct relationship between women's empowerment and Microfinance. These studies have indicated that microfinance impacts the economic condition of SHG women, and decision-making is considered a part of this enhancement in an economic condition which comes from doing economic activities and brings about financial independence (Shaheen et al.,2018). Apart from economic empowerment, some studies have highlighted the impact of Microfinance on social empowerment, which includes social participation, confidence, etc. (Gautam, 2024).

None of the existing literature discusses economic and social outcomes, which serve as mediating factors between microfinance and the decision-making ability of SHG women. A few studies discuss the individual impacts of social and economic on microfinance (Holvoet, 2005) but do not link these dimensions through a comprehensive mediation model. Also, a prior researcher (Gopalaswamy et al., 2016) suggested and developed the model based on qualitative research, specifying valuable conceptual insights into the impact of microfinance, micro-savings, and micro-credit on economic and social outcomes. Its findings remain exploratory and context-specific, and that creates a significant gap. A similar type of model can be tested through quantitative research.

The current paper tries to determine the impact of microfinance on the economic and social output of SHG women and the improvement of their decision-making ability.

This study addresses the following research questions:

RQ1:*Do economic and social outcomes mediate the relationship between microfinance participation and decision-making ability of SHG women?*
RQ2: Do economic and social outcomes sequentially mediate the relationship between microfinance participation and decision-making ability of SHG women?"

Drawing from the empowerment theory (Kabeer,1999), the study conceptualises microfinance as a resource that improves agency through economic and social enhancements which ultimately lead to improved decision-making ability. Also, Social capital theory as articulated by (Putnam,2000), emphasises the role of social network in the context of microfinance and self-help groups. Social capital is fostered by microfinance and SHG by strengthening inter personal relationships, mutual trust, collective agency which can influence decision making ability.

This study is carried out in Jaipur, Rajasthan, where examining the impact of microfinance is particularly relevant given the region's patriarchal history, where male members predominantly make decisions. In recent years, Rajasthan has witnessed significant growth in the microfinance sector. It has a distinct socio-economic structure, which also highlights the historical money lending practices in this region carried out by the Marwari and Baniya communities (Michie, 1978) before the advent of microfinance services. Traditionally, these communities served as moneylenders and lent money to farmers, small traders and artisans. They had entrepreneurial skills and could leverage their financial expertise to credit those lacking access to formal banking systems. While these moneylenders were considered the most important informal players in providing credit, they often faced criticism for exploitative practices such as usury and causing indebtedness to borrowers, especially women (Sharma, 2017).

Literature review

> *"There is no chance of the welfare of the world unless the condition of women is improved.*
>
> *It is not possible for a bird to fly on one wing".*
>
> *- Swami Vivekananda*

The analysis of literature is a prerequisite in any study. The current study has done an extensive review of prior research, which uncovers the efforts made by different researchers and enables one to initiate the contemporary topics of the research work. Several findings associated with the operation of Micro Finance Institutions (MFW) and Self-Help Groups (SHG), primarily in rural regions, have been carried out by various scholars at different levels in India and abroad. Enough literature exists on Microfinance, SHGs, SHG-bank linkage, etc. However, there is a need to study Microfinance and its impact on the well-being of women (physical and mental) as well as the economic and social impact of SHG and Microfinance on their decision-making ability using mediation effect, which is not done in previous studies.

The studies carried out by distinguished scholars in this field for tackling poverty and promoting the well-being of poor individuals involved various interventions and strategies aimed at eradicating poverty, including various research done by Raghavendra (2001), Shylendra (2004); Hietalahti and Linden (2006); G and K (2020); Maîtrot (2021); Wellalage and Thrikawala (2021); Ban et al. (2020) etc. These studies primarily concentrated on the status of microfinance and its impact on the members of SHGs regarding poverty reduction. In the same way, renowned researchers such as Woller (2002), Khandelwal (2007), and Ugiagbe (2014), etc., aimed at the socio-economic benefits of Self-Help Groups (SHGs) participants have conducted extensively. These studies broadly highlighted that microfinance is a prospective technique for promoting rural development through women and needs a comprehensive methodology that tackles rural communities' diverse needs and challenges. A review of various research papers done for the current study is elaborated further in this literature review section.

Microfinance and self-help groups (SHG)

Saha et al. (2015) state that Microfinance promotes development by alleviating poverty and supporting the poor in many developing countries. It grants speedy and substantial credit to the underprivileged. The primary role of microfinance is to make the unbanked bankable, i.e., enabling them to save, gain credit facilities, and upgrade their standard of living (Ban et al., 2020 ; Maity, 2023). The Mantra of Microfinance also aims to bank through the groups, empower the entire group, and ensure their financial and social well-being. It can be considered a pro-poor tool that empowers women by bringing them together, helping them set a common goal and improving their standard of living. Sahu et al. (2021) and Chaudhury& Misra (2018) highlighted that providing microcredit programs can help self-help groups achieve leadership skills, management skills, and organisational skills such as acquiring raw materials, using creative skills, marketing products and diversifying their business.

Microfinance and self-help groups (SHGs) have been extensively identified and used together as effective tools for community intervention in India. SHGs are often enabled by various stakeholders, including government agencies, NGOs, and multilateral organizations (Ban et al., 2020). The SHG model encourages group members, especially women, to come together, pool their funds, and provide mutual support for income-generating activities and social development initiatives (Aitken, 2013; Kabeer, 2005; Kilby,

2010). These SHGs usually group women from the community to regularly combine their savings (Saha et al., 2015). The collected funds are then used to credit members at lower interest rates, which can be used for various purposes, such as starting or expanding a business, covering educational expenses, or addressing emergencies (Guérin, 2014). It also promotes the financial inclusion of these members, i.e., making banking services affordable.

Microfinance, in a narrow sense, means providing small-size loans to people experiencing poverty, but it broadly deals with overall financial inclusion (Girard, 2021; Tara, 2016). Financial inclusion is not just about access to various financial services but also about guaranteeing that these services are inexpensive, apt, and efficiently meet the needs of the poor and needy, including vulnerable groups such as low-income women from rural and urban areas (Ban et al., 2020). By encouraging financial inclusion, policymakers, financial institutions, and development organizations can empower people, reduce poverty, and foster inclusive economic growth and development (Saha et al., 2015).

Microfinance and economic outcome

According to Wellalage and Thrikawala (2021) Improved Income level (IE), Financial Independence (FW) and Improved standard of living are widely used indicators of Economic outcome and empowerment. Access to microcredit enables women to engage in income generating activities, entrepreneurship and self-employment thereby increasing household and personal income. Financial independence (FW) reflects women's control over financial resources. Improved standard of living enhances their capabilities beyond just income.

In many developing countries, traditional banks devise rigorous lending norms and tend to be risk-averse, especially when it comes to extending credit to poor individuals or small businesses without substantial collateral or credit history. This makes it difficult for poor women to access formal financial services to nurture their businesses (Baland et al., 2011; Sengupta, 2013). Gender-responsive finance has gained much recognition in recent years. Financial institutions, policymakers, and development organizations increasingly focus on formulating and offering financial products and services that satisfy women's needs and preferences (Mathur & Agarwal, 2017).

In order to transition from small-scale income-generating activities to blossoming and sustainable enterprises, women entrepreneurs need a wide range of financial services such as credit, banking, and other services to develop productive assets (Wellalage & Thrikawala, 2021). A multi-faceted methodology needs to be employed to achieve economic empowerment, which also addresses primary obstacles and boosts gender-responsive strategies and plans that enable women's economic participation. This comprises initiatives to expand access to education and skills training, increase access to finance and productive assets, encourage women's entrepreneurship and leadership, and address biased laws and traditions that hamper women's economic empowerment. Priority to women's empowerment and the provision of better economic solutions can bring about sustainable development and gender equality (Kabeer et al., 2008).

Providing economic resources and better prospects boosts financial independence in SHG women by working as platforms that provide knowledge about existing market conditions and business intelligence to women in the group. Through group discussions, trainings, and workshops, SHGs provide women with insights into market trends, consumer preferences, pricing, and demand-supply dynamics (Saha et al., 2015).

It also fosters asset ownership and accumulation among women, including property, livestock, equipment, etc. It assists in accessing a range of financial services for women, including savings, credit, insurance, and remittance facilities, and further promotes entrepreneurship, opportunities for self-employment, and the creation of productive jobs, training, capacity-building, and skill development programs for women through various income-generating activities. Empowerment and women's economic participation are correlated as they allow women to dominate their own lives and be significant entities in their community (Anita & Ravindran, 2020; Chatterjee et al., 2018).

The above literature study (Mathur & Agarwal, 2017; Wellalage & Thrikawala, 2021) has acknowledged the importance of gender-responsive financial services. They have documented the need and availability of these services but have not evaluated their impact on individual economic outcomes, such as increased income, financial independence, and overall standard of living. Additionally, the research conducted by Kabeer et al. (2008) focuses on overcoming the barriers through the need to tackle the underlying barriers through a comprehensive approach, which includes education, knowledge of finance, and leadership skills. However, this paper is only theoretical and does not emphasise microfinance's impact on women's economic output in the absence of other factors. Another study conducted by Anita & Ravindran (2020) and Chatterjee et al. (2018) provides a connection between women's empowerment and economic participation but not on the impact of microfinance on economic measures like income levels or financial independence.

The existing literature surely provides insights into the importance of gender-responsive financial services and women's empowerment. However, it does not provide empirical evidence which can directly draw a connection

between microfinance interventions and specific economic outputs such as income enhancements, financial independence, and an improved standard of living for women. Likewise, although women's empowerment is broadly discussed in the literature, the means that microfinance empowers women economically—especially in rural or semi-urban settings, like those in Jaipur and Rajasthan- continue to be underexplored.

H1a: Microfinance has a significant impact on Economic Outcome.

Microfinance and social outcome

Social empowerment refers to the extent to which persons can aggressively participate in decision-making processes that affect their existence, specifically within their households or society. This can include decisions related to finances, education, healthcare, women's choice and right to move freely, i.e., social mobility, freedom from domestic violence, discussion and negotiations with respect to sex, access to formal education, and control over choosing their own spouse, and family size (Agrawal et al., 2021; Babalola & Fasokun, 2019; Chadha & Wadhwa, 2018). An individual can shape his future if he controls these important decisions. This further leads to shaping the well-being of their families (Akello et al., 2017).

Financial and social empowerment together can bring about self-confidence and autonomy through improvement in social status (SE), improvement of Mental and physical health (MPH), advancement in Social Interaction (SI) and self-efficiency (Hazra et al., 2019). This can allow them to change their preferences into likely actions, heading to social, economic, and psychological empowerment. (Kabeer et al., 2008; Kumar et al., 2021; Mathur & Agarwal, 2017).

Social status (SE) improves as women gain financial independence and contribute economically to households. Kabeer et al. (2008) emphasised that economic participation enhances women's societal position. Microfinance also contributes to improved mental and physical health through increased income, reduced stress and enhanced self confidence. Hazra et al. (2019) reported that economic empowerment programs positively impact psychological health outcomes. It further explains that Social Interaction (SI) is enhanced through SHG participation, which fosters networks, confidence, and collective action. Mathur and Agarwal (2017) demonstrated that social networks significantly influence microfinance participation and outcomes.

Existing research has highlighted the absence of confidence and decisiveness among women before joining SHG, which may be an effect of various can be the result of various existing issues in the society, such as patriarchal society, traditional bondages, societal norms, partial access to education and other resources that may dissuade women from actively participating in decision making (Suprabha, 2014). However, participation in SHGs often serves as a stimulus for change by instilling confidence in poor women and providing opportunities for skill development, peer support, leadership roles, etc. (Suprabha, 2014). Through their involvement in SHGs, women can gain confidence, assertiveness, and a sense of empowerment, which can positively impact their lives both within and outside of the group (Babalola & Fasokun, 2019; Bowen & Miller, 2018; Kumar et al., 2021; Mathur & Agarwal, 2017; Stromquist, 2006; Subramaniam, 2011).

Personality traits such as low confidence and assertiveness affect SHG training programs. These challenges impacted women's inclination to enthusiastically participate in group discussions, share their ideas, and take on leadership roles within SHGs (Suprabha, 2014). Other challenges were related to their social backgrounds, which hampered their literacy levels and provided limited financial exposure (Akello et al., 2017). Lack of literacy leads to ignorance of various financial concepts which are provided by various training programs. This confines their performance in SHG activities. Correspondingly, it may discourage women from successfully handling their finances or utilizing existing resources to their advantage within the SHG framework (Mathur & Agarwal, 2017).

If SHG women are provided with financial education and skill training, empowerment can indeed occur through the knowledge and skills they have gained. With this, they can manage several tasks in financial management, such as budgeting, cash management, savings, investment, and accessing formal credit sources (Kumar et al., 2021; Levi-D' Ancona, 2014).

Such programs can help in the confidence building of these women, especially with respect to financial decision-making; they help them gain competence to assess risks and opportunities and support comprehensive financial practices within their enterprises. This results in better involvement of women in SHG activities and similar initiatives. They are better equipped to steer the complexities of handling their businesses and improving their economic well-being (Akello et al., 2017).

Financial independence and resilience can be increased through awareness and an increased literacy rate. This can also reduce women's vulnerability to losses and economic shocks and help them make better and more informed choices for themselves and their families. Therefore, integrating financial education and awareness components into SHG training programs can contribute meaningfully to the success and sustainability of women-led enterprises

and broader community development efforts (Eldred et al., 2014).

Decision-making power and confidence within families can prove to improve women's social status (Akello et al., 2017). Educating women, especially adults, plays a vital role in empowering them by offering them the awareness, skills, and assurance to contribute more to society (Eldred et al., 2014). According to various research, better health outcomes, better incomes, and the ability to make informed decisions within the family and society can be achieved through education. Additionally, education helps women break free from redundant gender roles and antiquated social beliefs, permitting them to pursue their goals and ambitions (Akello et al., 2017). In particular, adult education can be a powerful tool for encouraging gender equality and women's empowerment. (Babalola & Fasokun, 2019; Deekor & Emanerame, 2022; Ganle et al., 2015).

In Marathi, there is a saying that - "मुलगी शकिली प्रगती झाली" which means "**if girls are educated**, **progress is assured".** Education, specifically women's education, certainly impacts family health, better infant survival, enhanced labour productivity, and rapid economic growth (Baland et al., 2011; Cremin & Nakabugo, 2012; Jayachandran, 2021; Sehrawat & Giri, 2017). With the absence of education, formal training and skill development, women will not be confident enough to participate in income-generating activities, which can bring them out of the vicious circle of poverty and vulnerability. Also, illiteracy and ignorance about their rights will subject women to abuse and exploitation, as they will not be in a position to advocate for themselves (Akello et al., 2017). Empowering women through education can surely help them participate in economic activities, make informed decisions about their lives, and support their rights. By investing in adult education programs adapted to the needs of women, societies can support their empowerment, implement economic development, and add to greater gender equality (Quan-Baffour, 2012).

Women's overall empowerment is influenced by their mental and physical health, which can positively impact women's psychological empowerment. It helps women make the right choices for better autonomy and control over their lives. This can be proved through increased self-confidence, efficiency, and self-confidence in women (Hazra et al., 2019). Psychological empowerment, along with access to education and a supportive environment, further helps women pursue their goals and make decisions that value themselves and their families. Eventually, promoting psychological empowerment among women is essential for promoting their overall well-being and advancing gender equality. (Akello et al., 2017; Chadha & Wadhwa, 2018; Kumar et al., 2021; Khandare & Gajanan, 2016).

The existing literature gives a broad understanding of social empowerment. It discusses the decision-making power of women with respect to family, finance, education, and health care, as well as freedom from domestic violence and discrimination (Agrawal et al., 2021; Babalola & Fasokun, 2019). However, there is limited emphasis on the scope of social empowerment/social outcomes factors, such as social status, mental and physical health, and social interaction. There is enough literature suggesting that microfinance enhances the investment in income-generating activities and brings about financial well-being, which in turn results in social empowerment (Baland et al., 2011; Wellalage & Thrikawala, 2021). The available literature does not explore the effect of microfinance on social status and mental and physical health.

H1b: Microfinance has a significant impact on Social Outcome.

Economic outcome, social outcome and decision-making

According to Kochar et al. (2022), microfinance programs aim to empower women specifically, and they are successful in certain contexts, but their impacts vary significantly in poverty reduction and empowering women, as well as their impact on women's household decision-making. An evaluation of different microfinance programs shows an insignificant effect on women's decision-making ability in SHG. While microfinance programs are directed at empowering women both economically and socially, they do not have any direct impact on their household decision-making (Wellalage & Thrikawala, 2021).

SHGs have been broadly considered to empower women and upgrade their decision-making abilities, mainly in economic activities and community development. However, the findings from different research differ. According to Jayachandran et al. (2021) review of livelihoods, SHGs disclose positive effects on women's decision-making ability in only half the findings they researched. When only half of the analyses show positive effects on women's decision-making abilities, it is crucial to investigate the causes behind this discrepancy (Kilby, 2010).

South Asia, which has deeply rooted patriarchal norms, shows the specific problem of gender inequality, which is a cause of concern. Women in these regions face systematic discrimination in various domains of life, whether it is economic and business opportunities, political representation, or social status (Wellalage & Thrikawala, 2021). It is essential to address these inequalities for the well-being of women as well as their overall development as individuals and as a society. These economies have previously been

categorised by major differences in women's access and ownership of assets, including education and health (Wellalage & Thrikawala, 2021).

Empowerment as an effect of microfinance is not just about ownership of physical assets; it also integrates woman's ability to make decisions on their own, whether the decisions are household or related to their business and follow their aspirations. It also deals with their social, economic, and political lives (Kilby, 2010). Empowerment gives women the autonomy to shape their destinies rather than just providing them with opportunities for saving and credit to gain economic and social independence (Kabeer, 1999). This may also include interventions that update and educate women about their rights, privileges, and choices before providing them the means to exercise these rights (Mathur & Agarwal, 2017).

The existing household dynamics decide the woman's capability of making choices specifically regarding goods and services that are appropriate to them. Traditional economic models often assumed a single household with common preferences, where decisions were made collectively, and resources were allocated according to the well-being of the entire family unit. (Wellalage & Thrikawala, 2021). However, this practice disregards the variety of household preferences and decision-making power, particularly regarding gender dynamics. In the theoretical models of household behaviour, household members, including women, are recognized as independent decision-makers with their own desires and functions of effectiveness. This provides a better understanding of how resources are allocated within households and how individuals shape spending and investment decisions.

In traditional common preference models, decisions are assumed to be made collectively and not by any individual person, and it is not considered important who made the decisions. However, complexities arise when a difference of opinion exists between a husband and wife regarding the allocation of resources. Models such as the collective model, pioneered by Chiappori (1988) and further developed by Bourguignon et al. (2009), provide a framework for understanding how households make decisions in the incidence of diverse preferences.

The collective model (Chiappori, 1988; Bourguignon et al., 2009), elaborated that household decisions are observed as effective results that maximize the overall utility of the household, which is a weighted sum of the utility functions of its individual members. The utility of each member reflects their preferences, and the weights assigned to each member reflect their relative influence or bargaining power within the household. For example, a woman's relative Pareto weight indicates the extent to which her preferences influence household allocations.

We can identify the difficulties of household decision-making by integrating the insights from models like the collective model into empirical research and policy analysis and can further plan more well-organized interventions to encourage gender equality and women's empowerment. (Mathur & Agarwal, 2017). This may involve strategies to enhance women's bargaining power within households, such as providing them with greater access to education, income-earning opportunities, and decision-making forums, as well as challenging discriminatory norms and practices that limit women's autonomy and agency.

According to a study conducted by Wellalage and Thrikawala (2021), the influence of microfinance on decision-making varies and is inclined by shifts in household dynamics despite the programs' focus on women. This shows that while financial inclusion programs target women, the translation of economic and social outcomes into better decision-making power remains unpredictable. Brody et al. (2015) and Jayachandran et al. (2021) point out that the association between microfinance and decision-making power is not always positive, highlighting the complexity of this relationship. Women may gain economic and social benefits but still face cultural or household barriers limiting their decision-making authority.

Chen et al. (1981) highlight that there is a significant difference between women's access to education, health, and asset ownership, which can surely influence their ability to contribute to household decisions. These structural factors may hinder the ability of microfinance to fully empower women in decision-making. Even though the existing literature recognizes the potential of microfinance to empower women economically and socially, there is limited empirical research on how these economic and social outputs, such as increased income, financial independence, improved social status, and mental health, contribute to improved decision-making ability within households. The existing literature highlights the complexity of this relationship, but the specific mechanisms through which microfinance strengthens or fails to strengthen decision-making power, particularly in the context of SHGs (self-help groups), are underexplored.

H1c: Economic Outcome has a significant impact on Social Outcome.
H1d: Economic Outcome has a significant impact on Decision-Making.
H1e: Social Outcome has a significant impact on Decision-Making.

To enhance the theoretical foundation of the proposed framework, this study draws upon the conceptualization of empowerment articulated in previous literature (Kabeer, 1999; Kabeer et al., 2008), which defines empowerment as

a process encompassing resource access, agency development, and outcome attainment. Complementing this, Sen's (1999) Capability Approach argues that financial resources alone are insufficient — what matters is whether women can convert these resources into real capabilities and freedoms. In microfinance, though access to financial services for women is an important economic resource, having access alone doesn't automatically empower them.

In microfinance, though access to financial services for women is an important economic resource, having access alone doesn't automatically empower them. Instead, these resources contribute to better economic outcomes, such as higher income, financial independence, and an improved quality of life, which empower women to manage their finances more effectively. Previous research indicates that economic gains may result in higher social standing, including heightened social status, increased confidence, and greater engagement in community interactions (Mathur & Agarwal, 2017; Hazra et al., 2019). These social and economic improvements collectively contribute to improved engagement in household and societal decision-making. Accordingly, this study suggests that the relationship between microfinance and decision-making is not direct but acts through economic and social results.

Based on the above theoretical reasoning, the current study further examines the mediating mechanisms through which microfinance influences decision-making, specifically through economic and social outcomes.

In line with prior research, this study models economic outcomes and social outcomes as higher-order (second-order) constructs composed of multiple first-order dimensions. Specifically, economic outcomes are conceptualized as a multidimensional construct reflected through income enhancement, financial wellbeing, and skill development, while social outcomes are captured through social status, mental and physical health, and social interaction. The use of second-order constructs is appropriate when a latent concept is theoretically broad and cannot be adequately represented by a single dimension (Diamantopoulos et al. 2008; Hair et al. 2019a, 2019b). Furthermore, drawing on Kabeer's (1999) empowerment framework, women's empowerment is inherently multidimensional, encompassing both economic and social domains. Therefore, modeling economic and social outcomes as higher-order constructs enables a more comprehensive and theoretically grounded representation of empowerment processes in the context of microfinance.

Unlike prior studies that scrutinize direct relationships, this study contributes to literature by testing a sequential mediation framework capturing the layered process through which microfinance translates into empowerment through decisionmaking ability.

Mediation hypothesis

H2a: Economic Outcome mediates the relationship between Microfinance and Decision-Making.
H2b: Social Outcome mediates the relationship between Microfinance and Decision-Making.
H2c: Microfinance influences Decision-Making through a sequential mediation of Economic and Social Outcomes.

Research methodology

The research literature offers several existing scales to measure the constructs of this study. Given the unique aspects of our research and respondent pool, existing scales may not be used as they are. Therefore, researchers also used a qualitative feedback approach and literature to identify better items that better represent the sample. Economic outcomes represent financial benefits such as income, assets, and financial independence (Mengstie, 2022; Chirkos, 2014), whereas social outcomes reflect changes in social positioning, engagement, and agency (Nichols, 2021; Khan et al., 2020). Decision-making is viewed as a distinct outcome associated with women's participation in family decisions (Kochar et al., 2022). All elements were examined and preserved based on their theoretical alignment and contextual significance, guaranteeing conceptual coherence.

This research study was conducted by utilizing a survey approach with the implementation of purposive sampling. The main source of data was collected through a survey conducted among 306 women who were members of self-help groups (SHGs) registered under the NGO known as the "Peetambara Foundation". These women resided in the villages near Pink City, Jaipur, in the state of Rajasthan, India. According to Hair et al. (2019a, 2019b), the sample size should ideally maintain a ratio of at least five to ten observations per estimated parameter. As this study examined 33 items, the minimum requirement ranged between 165 and 330 participants. The final sample of 306 respondents comfortably meets these criteria, providing sufficient statistical power for the analysis.

A structured questionnaire was utilized as the data collection instrument to collect the primary data. The questionnaire consisted of two main parts: demographic information and a 5-point Likert scale. It aimed to capture various details about the respondents, including their age, education level, number of family members, occupation, monthly family income before and after joining the SHG, and other relevant aspects. Before proceeding with answering the survey questions, participants were provided with a consent statement

clearly explaining the purpose of the study, the voluntary nature of participation, assurance of anonymity, and data usage. Only those respondents who explicitly indicated their consent were allowed to proceed with the survey.

A local individual who was fluent in the local language was hired to accommodate efficient communication and help respondents understand during data collection. This study involved 306 respondents, 70% of whom were aged 20–30 years and only 3% of whom were aged 40–50 years. A schedule-based survey method was used to help potential illiterate SHG women. An Increase in the average monthly income of the respondents was noticed. Primary data was collected through surveys, and supplementary data was collected through books, websites, journals, and other data platforms. These secondary data sources provided additional insights and context for the study. Various measures were employed to gather information aligned with the study's objectives. Statistical analysis was conducted using SPSS and AMOS. The study employed a structured three-stage analytical strategy. In the first stage, Exploratory Factor Analysis (EFA) was conducted using SPSS to examine the underlying factor structure of the measurement items. Principal Component Analysis (PCA) was used as the extraction method with Varimax rotation. In the second stage, first-order Confirmatory Factor Analysis (CFA) was performed separately for the EO and SO second-order constructs, following the two-step approach recommended by Anderson and Gerbing (1988). This ensured rigorous assessment of convergent and discriminant validity for each higher-order construct independently, prior to full structural model estimation. In the third and final stage, the complete higher-order structural model was estimated using Covariance-Based SEM (CB-SEM). CB-SEM was selected as it is appropriate for theory-confirmatory research, supports maximum likelihood estimation, and enables comprehensive global model fit assessment (Hair et al. 2019a, 2019b; Kline 2016). Model fit was evaluated using CFI, TLI, RMSEA, and SRMR, and structural paths were assessed for significance using standardised estimates and p-values.

Economic outcomes and social outcomes were modeled as higher-order (second-order) constructs to capture their multidimensional nature. Following recommended SEM procedures, a two-stage approach was adopted. In the first stage, all first-order constructs (IE, FW, EC, SE, MPH, and SI) were assessed independently to establish reliability and validity. In the second stage, these validated first-order constructs were used to estimate the higher-order constructs of economic outcomes and social outcomes. This hierarchical modelling approach is appropriate when constructs are theoretically broad and multidimensional. It improves model parsimony while preserving conceptual richness Hair et al. 2019a, 2019b). Furthermore, consistent with the empowerment framework proposed by Naila Kabeer (1999), women's empowerment is inherently multidimensional, encompassing both economic and social dimensions.

To examine the impact of microfinance on the improved well-being of SHG women, a principal component analysis was conducted to extract a set of factors. Also, this research aimed to generate theory through reflection rather than validate existing theory through formative assessment (Ingram & Nitsenko, 2021; Tobi et al., 2017).

Operational definition of the variables have been defined in Table 1.

Data analysis

Exploratory factor analysis

This study extends the thematic framework developed by Gopalaswamy et al. (2016) with the help of second-order structural equation modelling. Economic Outcome and Social Outcome are the second-order latent variables. The two key structural equation modelling elements are the outer and inner models (Hair et al., 2011). Table 2 presents the results of the outer model, which measures how well the combined set of indicators captured the constructs. All the factors with loadings greater than 0.5 were considered to maintain these components' validity (Fincham et al., 2008). The composite reliability of the constructs is also above the threshold of 0.7, and Bartlett's Test of Sphericity was also significant at a 5% level.

Harman's single-factor test was used to assess the appropriateness of the study constructs for common method bias in SPSS. The results indicate that the first factor accounted for less than 50% of the total variance (the recommended threshold). Therefore, it can be concluded that the data did not exhibit common method bias.

In this study, a literature survey was done to generate the conceptual model [developed by Authors], which accumulated relationships between endogenous and exogenous variables to test the developed hypotheses. (Figure 1.)

Table 3 summarizes the results of the inner model that captures the paths between the constructs.

The outer model (Hair et al., 2011) of the structural equation model measures the impact of each indicator in representing its associated construct and measures how well the combined set of indicators represents the construct (Hair et al., 2014), whereas the inner model indicates the connections between the constructs (Hair et al., 2011; Henseler et al., 2014).

Convergent validity is evaluated by computing the Composite Reliability and Average Variance Extracted (AVE). If the AVE values are greater than 0.50, it signifies the reliability of the indicator measurements, as reported in the

Table 1 Operational definition of variables

Variable	Type	Code	Definition	Reference
Micro finance	Independent	MF	Access to and awareness of microfinance services through SHGs, including business expansion support and knowledge of interest rates.	Khandker (2005); Swain and Wallentin (2009)
Economic outcome	Mediator	EO	Improvements in income, financial wellbeing, and economic capability of SHG women, including asset accumulation, spending confidence, and entrepreneurship skills.	Morduch (1995); Sen (1999); Kabeer (1999)
Social outcome	Mediator	SO	Improvements in social empowerment, health and wellbeing, and mobility of SHG women, including social interaction, physical and mental health, and freedom of movement.	Hashemi et al. (1996); Schuler et al. (1997)
Decision making ability	Dependent	DM	The extent to which SHG women participate in key household decisions, including family planning, property, education, and marriage.	Kabeer (1999); Pitt et al. (2006)

work by Amora (2021). In our study, the AVE exceeded 0.50 for all constructs, and the Composite Reliability was above 0.70 for all constructs, meeting the condition where CR > AVE. These results guided the calculation of path coefficients as an initial stage for subsequent analyses, including path analysis with the use of bootstrapping techniques. This suggests the measures capture substantial variance in their intended latent construct (Table 4).

Discriminant validity, a key concept ensuring measures capture distinct constructs, is often assessed using the Fornell-Larcker criterion, which relies on comparing weights (Table 5). The Fornell-Larcker criterion is a popular tool for estimating the extent to which latent variables in a model share variance (Henseler et al., 2014). This criterion suggests that satisfactory discriminant validity exists when each construct's variance is higher than its correlation with any other construct in the developed model. This indicates that the latent constructs have more variance explained by their own items than by items measuring other constructs. The outcome of this study also holds the same (Table 5) and verifies that there is no discriminant issue.

Result and discussion

The results indicate that microfinance does not exert a strong direct influence on women's decision-making ability; instead, its impact operates primarily through economic and social empowerment pathways. As shown in Tables 6 and 7, the direct effect of microfinance on decision-making is weak and statistically insignificant, whereas the total indirect effect is positive and significant. This finding is consistent with earlier studies (Kabeer, 2005; Ganle et al., 2015), which similarly report limited direct effects on women's agency when financial access is examined in isolation. However, it contrasts with studies that have documented a direct positive relationship between microfinance participation and empowerment outcomes (Swain & Wallentin, 2009; Khan et al., 2020), suggesting that empowerment effects may be context-specific and mediated by intermediate outcomes.

The findings of this study are broadly consistent with evidence from other developing economies. Similar to Khandker (2005) in Bangladesh and Swain and Wallentin (2009) in India, this study finds a positive association between microfinance participation and economic outcomes among women SHG members. The link between microfinance and improved decision-making ability aligns with Pitt et al. (2006), who reported increased household decision-making power among microfinance beneficiaries in Bangladesh.

The significant mediation through economic outcomes (MF → EO → DM) aligns with prior evidence that improvements in income, skills, and financial stability enhance women's bargaining power and autonomy within households. Holvoet (2005) emphasizes that access to and control over economic resources strengthen intra-household decision-making roles, while SHG-based studies in India report increased financial confidence and participation following income generation (Raghunathan et al., 2022). The present findings align with this body of research by confirming that economic empowerment is a foundational driver of agency rather than a peripheral benefit of microfinance.

The mediation through social outcomes (MF → SO → DM) is also consistent with earlier literature highlighting

Table 2 Factor loadings and estimates

Construct	Item	Composite reliability	Factor loadings	Estimates
Micro Finance (MF) (Khan et al., 2020)	"You have availed microfinance services in your SHG"	0.868	0.54	0.711***
	"Micro Finance facility has helped enhance/expand your business"		0.65	0.850***
	"You are aware of benefits of microfinance"		0.73	0.825***
	"You are aware of interest rates that you get on Micro Finance"		0.63	0.761***
Income Enhancement (IE) (Mengstie, 2022; Chirkos, 2014)	"Economic condition of people improved after joining SHG"	0.769	0.58	0.506***
	"Wage and salary (work that is paid for in cash or in kind, including both agriculture and other wage work) has improved"		−0.6	−0.970***
	"You now have more assets as compared to the time before joining SHG"		−0.65	−0.664***
Economic Capability (EC) (Mengstie, 2022)	"There has been improvement in your social status (economic capability)"	0.862	0.75	0.805***
	"You are able to better cater for family needs"		0.79	0.899***
	"Developed entrepreneurship skills"		0.84	0.765***
	"You are able to arrange the credit and other inputs in time"		0.65	0.698***
Financial Wellbeing (FW) (Mengstie, 2022; Chirkos, 2014)	"There has been improvement in affordability (consumption)"	0.839	0.78	0.758***
	"There has been poverty reduction in the community"		0.79	0.904***
	"There has been confident spending"		0.65	0.728***
Social Empowerment (SE) (Khan et al., 2020; Nichols, 2021)	"Household income has increased"	0.861	0.66	0.728***
	"There has been increase in trust in other households"		0.68	0.822***
	"There has been increase in repayment rates"		−0.63	−0.506***
	"You are able to spend more on essential items"		0.7	0.805***
	"You are able to afford/procure goods that you could not buy earlier"		0.64	0.734***
Mental & Physical Health (MPH) (Khan et al., 2020)	"You are aware of covid 19 symptoms"	0.870	0.7	0.732***
	"You perform yoga/meditation for your mental well-being"		0.75	0.857***
	"You regularly witness mental abuse at home/work"		0.82	0.861***
	"You have given the required vaccines to your child"		0.7	0.705***
Social Interaction (SI) (Nichols, 2021)	"you agree that woman should go to the hospital/clinic/doctor (seek health service)"	0.887	0.75	0.788**
	"you agree that woman should go to visit a friend/neighbour's house"		−0.66	−0.689***
	"you agree that woman should go to visit family or relatives"		0.79	0.834***
	"You have interacted with bank officials found them helpful"		−0.61	−0.612***
	"you agree that woman should go to the market/haat/bazaar"		0.78	0.753***
Decision-Making Ability (DM) (Khan et al., 2020; Kochar et al., 2022)	"Your involvement in the decision-making on family planning increased"	0.744	0.71	0.658***
	"Your involvement in the decision-making on buying and selling of property increased"		0.65	−0.386***
	"Your involvement in the decision-making on sending your daughter to school increased"		0.62	0.886***
	"Your involvement in the decision-making of your children's or your marriage increased"		0.77	−0.481***

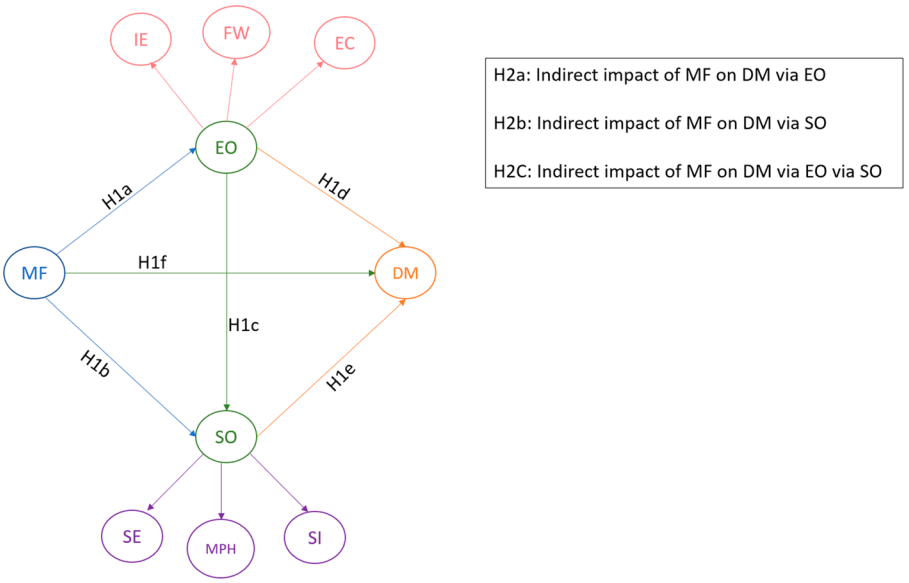


Fig. 1 Conceptual model developed by the Authors

Table 3 The CFA results for the measurement model for all sub-constructs

Construct	Item	CR	AVE	IE	FW	EC	EO
Economic outcome (EO)	IE	0.775	0.664	0.815			
	FW	0.874	0.720	0.456	0.849		
	EC	0.839	0.755	−0.261	−0.42	0.869	
	EO	0.810	0.509	0.695	0.657	−0.704	0.881
Social outcome (SO)	**Item**	**CR**	**AVE**	**SE**	**MPH**	**SI**	**SO**
	SE	0.864	0.615	0.784			
	MPH	0.870	0.719	0.430	0.848		
	SI	0.860	0.765	0.206	0.343	0.874	
	SO	0.831	0.508	0.786	0.624	0.586	0.832

Micro Finance (*MF*), Income Enhancement (*IE*), Economic Capability (*EC*), Financial Wellbeing (*FW*), Social Empowerment (*SE*), Mental & Physical Health (*MPH*), Social Interaction (*SI*), Decision-Making Ability (*DM*)

Table 4 Convergent validity

	Cronbach's alpha	Composite reliability (rho_a)	Average variance extracted (AVE)
DM	0.703	0.744	0.535
EO	0.672	0.853	0.520
EC	0.868	0.874	0.720
FW	0.836	0.839	0.755
IE	0.745	0.769	0.664
MF	0.865	0.868	0.712
MPH	0.866	0.870	0.719
SI	0.821	0.887	0.634
SO	0.726	0.862	0.501
SE	0.601	0.861	0.616

Micro Finance (*MF*), Income Enhancement (*IE*), Economic Capability (*EC*), Financial Wellbeing (*FW*), Social Empowerment (*SE*), Mental & Physical Health (*MPH*), Social Interaction (*SI*), Decision-Making Ability (*DM*)

the role of social capital and collective engagement in empowerment processes. Studies by Ban et al. (2020) and Nichols (2021) demonstrate that SHGs foster peer support, confidence, and community participation, thereby enhancing women's social visibility and influence in household and community decision-making. The current results align with these findings by empirically showing that social empowerment significantly translates financial participation into decision-making ability.

The sequential mediation pathway (MF → EO → SO → DM) provides further insight into the empowerment process. While Kabeer et al. (2008) conceptually frame empowerment as a progression from resources to social achievements and ultimately to agency. The present study aligns with this theoretical framework by statistically confirming that economic improvements precede social empowerment, which, in turn, facilitates decision-making.

Table 5 Discriminant validity (Fornell-Larcker criterion)

	DM	EO	EC	FW	IE	MF	MPH	SI	SO	SE
DM	0.731									
EO	0.600	0.656								
EC	0.485	0.864	0.879							
FW	−0.559	−0.727	−0.420	0.869						
IE	0.319	0.694	0.454	−0.263	0.815					
MF	−0.080	−0.137	0.035	0.189	−0.219	0.844				
MPH	−0.134	−0.281	−0.063	0.257	−0.401	0.55	0.848			
SI	−0.011	−0.120	−0.060	0.105	−0.123	0.531	0.289	0.796		
SO	−0.218	−0.433	−0.217	0.368	−0.467	0.617	0.802	0.626	0.707	
SE	−0.309	−0.518	−0.335	0.423	−0.467	0.294	0.429	0.182	0.760	0.785

Micro Finance (*MF*), Income Enhancement (*IE*), Economic Capability (*EC*), Financial Wellbeing (*FW*), Social Status (*SE*), Mental & Physical Health (*MPH*), Social Interaction (*SI*), Decision-Making Ability (*DM*)

Table 6 Sequential mediation analysis

Regression		Model indices		Coefficients
Dependent variable	Independent variable	R^2	p-value	β
EO	MF	0.0288	0.0028	0.1698
SO	MF	0.3580	0.000	0.5394
	EO		0.001	0.1831
DM	MF	0.3109	0.082	0.1013
	EO		0.000	0.4784
	SO		0.049	0.1126

β = standardized coefficients. $p < 0.05$. All variables were standardized. Micro Finance (*MF*), Income Enhancement (*IE*), Economic Capability (*EC*), Financial Wellbeing (*FW*), Social Empowerment (*SE*), Mental & Physical Health (*MPH*), Social Interaction (*SI*), Decision-Making Ability (*DM*)

Table 7 Total, direct, and indirect effects

Path	β	95% Confidence Interval	
Total effect	0.1399	0.0780	0.2018
Direct effect	0.0574	−0.0074	0.1222
Total indirect effect	0.1455	0.0611	0.2430
MF → EO → DM	0.0812	0.0286	0.1397
MF → SO → DM	0.0607	0.0033	0.1268
MF → EO → SO →DM	0.0035	0.0001	0.0091

Bootstrap sample size = 2000; Micro Finance (*MF*), Income Enhancement (*IE*), Economic Capability (*EC*), Financial Wellbeing (*FW*), Social Empowerment (*SE*), Mental & Physical Health (*MPH*), Social Interaction (*SI*), Decision-Making Ability (*DM*)

Conclusions and managerial implications

This research emphasises the importance of interventions aimed at enhancing the decision-making abilities of SHG women, focusing on both economic and social outcomes. Microfinance not only provides financial access to these women but also promotes a culture of savings and skill development, which in turn improves their well-being. The findings of the study specify enhancement in the decision-making abilities of these women due to economic stability gained through microfinance, thus strengthening their role within their families and communities at large. Additionally, involving women in community activities and decision-making can reinforce positive social outcomes.

Further, economic independence and social influence may be improved if they access technology and market linkages, further enhancing their decision-making capabilities. Systematic supervision and feedback mechanisms are cardinal to ensuring that interventions align with the challenges faced by SHG women, promoting ecological and sustainable growth.

Financial institutions and policymakers must collaborate to create a favourable regulatory ecosystem for these SHG women to ensure their sustainable growth by focusing on their capacity building, entrepreneurial skills development, leadership training programs, and skill development, including financial and technology literacy. This will ensure the effectiveness of microfinance interventions. Further, as per the needs of these women, customized financial products may be created by microfinance institutions. Additionally, social empowerment may be reinforced through community engagement initiatives.

Integration of these strategies by microfinance institutions, policymakers, and development agencies can ensure the optimization of the social and economic benefits of SHG-based financial inclusion programs, eventually contributing to broader economic development.

At micro level, women in SHG linked to Pitambara foundation often engage in different income generating activities improving their household income. Women gain negotiation power and bargaining strength within the household. SHG improve confidence and public participation of women and at macro level, Microfinance leads to sustainable livelihood and reduced dependency on exploitative lending practices.

Policy implications

The study has important policy implications for improving microfinance outcomes for women in SHGs. Mainstreaming financial literacy in SHG programmes and stabilizing income streams should be a priority to improve financial security and repayment capacity. Market linkages (through buyers and digital platforms) can help create sustainable livelihoods. Regular and mandatory savings can also help develop financial discipline and reduce dependence on external credit.

Limitations and future scope

The current research has some limitations that could impact the generalizability and depth of the findings. One of the limitations is that SHG women are engaged in a single type of business, i.e., handmade jewellery, which limits the analysis to a specific sector and fails to capture the broader impact of microfinance across diverse industries. Therefore, a single-sector focus exposes SHGs to market changes, limiting their chances of diversifying income sources. Geographically, this study is confined to Rajasthan, a state in India that may not reflect the varied challenges, opportunities, and socio-economic factors influencing SHGs in other regions of India.

The study is based on data collected from SHG members associated with the Peetambara Foundation in a specific geographical region. While this provides valuable contextual insights, it may limit the generalizability of the findings to other regions or populations. Future research may consider larger and more diverse samples across different states or countries to enhance external validity. Also, the SHG women's lack of formal and informal education limits their financial management skills, potentially skewing the study's findings on the benefits of microfinance. The methodological approach of this study, especially the use of sequential mediation analysis, also confines the exploration of more complex, multi-layered relationships among variables that might exist in real-world empowerment scenarios.

Also, in a cross-sectional study, causal directionality cannot be fully established. Endogeneity remains a limitation, and future research should consider longitudinal or instrumental variable approaches.

Abbreviations

MF	Micro Finance
IE	Income Enhancement
EC	Economic Capability
FW	Financial Wellbeing
SE	Social Empowerment
MPH	Mental& Physical Health
SI	Social Interaction
DM	Decision-Making Ability

Author contributions Prof. Rupali led the conceptual and theoretical development of the study, including conducting the literature review, identifying research gaps, designing the conceptual framework. Prof. Prerna assisted in managing the data collection process, data cleaning and coding, and preparation of the dataset for analysis. She also supported the analytical procedures and contributed to drafting the methodology and results sections.Prof. Rinku was responsible for the empirical execution of the study, including designing the data collection strategy, developing the survey instrument, supervising the data collection process, and conducting the statistical analysis.

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Data availability Following is the DOI of the data. DOI –https://doi.org/10.17605/OSF.IO/G2HTW.

Declarations

Research involving human participants and/or animals All participants provided informed consent prior to their involvement in the study. Data were anonymized before analysis to uphold participant confidentiality.

Informed consent Approval for the study was granted by the appropriate ethics committee.

Competing interests The authors declare no competing interests.

References

Agrawal, A., Gandhi, P., & Khare, P. (2021). Women empowerment through entrepreneurship: Case study of a social entrepreneurial intervention in rural India. *International Journal of Organizational Analysis*, *31*(4), 1122–1142. https://doi.org/10.1108/ijoa-03-2021-2659

Aitken, R. (2013). The financialization of Micro-Credit. *Development and Change*, *44*(3), 473–499. https://doi.org/10.1111/dech.12027

Akello, J. A., Lutwama-Rukundo, E., & Musiimenta, P. (2017). Functional adult literacy: An alternative gateway to grassroots women's improved income generation in Lango Subregion, Northern Uganda. *Adult Education Quarterly*, *67*(2), 79–96. https://doi.org/10.1177/0741713616685143

Amora, J. T. (2021). Convergent validity assessment in PLS-SEM: A loadings-driven approach. *Data Analysis Perspectives Journal*, *2*, 1–6.

Ancona, L. D. (2014). E. Financial literacy and financial inclusion of women in rural Rajasthan. Independent Study Project (ISP) Collection. https://digitalcollections.sit.edu/isp_collection

Anderson, J. C., & Gerbing, D. W. (1988). Structural equation modeling in practice: A review and recommended two-step approach. *Psychological Bulletin*, *103*(3), 411–423.

Babalola, A. C., & Fasokun, T. O. (2019). Literacy education and social capital: A study of women's involvement in community development projects in southwestern Nigeria. *Journal of Education and Research, 9*(1), 91–117. https://doi.org/10.3126/jer.v9i1.28827

Baland, J. M., Demont, T., & Somanathan, R. (2011). Microfinance mechanisms: Evidence from observational panel data about Self-Help Groups in India. Mimeo, Namur University, 1–35.

Ban, R., Gilligan, M. J., & Rieger, M. (2020). Self-help groups, savings and social capital: Evidence from a field experiment in Cambodia. *Journal of Economic Behavior & Organization*, *180*, 174–200. https://doi.org/10.1016/j.jebo.2020.09.029

Bhaskar, H. L., & Yadav, S. (2025). Impact of self-help groups (SHGs) on entrepreneurship development an empirical study. *Journal of Global Entrepreneurship Research*, *15*(1). https://doi.org/10.1007/s40497-025-00473-0.

Bourguignon, F., Browning, M., & Chiappori, P. (2009). Efficient intra-household allocations and distribution factors: implications and identification. The review of economic studies, *76*(2), 503–528. https://doi.org/10.1111/j.1467-937x.2008.00525.x.

Bowen, D. S., & Miller, A. L. (2018). Education, leadership, and conservation: Empowering young Q'eqchi' women in Guatemala. *International Journal of Educational Development*, *59*, 28–34. https://doi.org/10.1016/j.ijedudev.2017.10.012

Brody, C., Hoop, T., Vojtkova, M., Warnock, R., Dunbar, M., Murthy, P., & Dworkin, S. L. (2015). Economic self-help group programs for improving women's empowerment: A systematic review. *Campbell Systematic Reviews, 11*(1), 1–182. https://doi.org/10.4073/csr.2015.19

Anita, C., & Ravindran, D. (2020). Enrolment of women in higher education: A comparative study on women's equity in governance and employment status in India. *Journal of International Women's Studies, 21*(5), 65–78.

Chadha, N., & Wadhwa, S. (2018). Impact of an adult literacy programme on the personal and public lives of women. *Journal of South Asian Development, 13*(1), 82–111. https://doi.org/10.1177/0973174118764930

Chatterjee, E., Desai, S., & Vanneman, R. (2018). Indian paradox: Rising education, declining womens' employment. *Demographic Research, 38*, 855–878. https://doi.org/10.4054/demres.2018.38.31

Chaudhury, S. K., & Misra, D. P. (2018). Role of self help groups in promoting self-reliance among its members: A study of selected districts of Odisha. *Sumedha Journal of Management, 7*(3), 130–143.

Chen, L. C., Huq, E., & D'Souza, S. (1981). Sex bias in the family allocation of food and health care in rural Bangladesh. *Population and Development Review, 7*(1), 55. https://doi.org/10.2307/1972764

Chiappori, P. (1988). Rational household labor supply. *Econometrica*, *56*(1), 63. https://doi.org/10.2307/1911842

Chirkos, A. Y. (2014). The impact of microfinance on living standards, empowerment and poverty alleviation of the poor people in Ethiopia, a case study in ACSI. *Research Journal of Finance and Accounting, 5*(13), 43–66.

Cremin, P., & Nakabugo, M. G. (2012). Education, development and poverty reduction: A literature critique. *International Journal of Educational Development*, *32*(4), 499–506. https://doi.org/10.1016/j.ijedudev.2012.02.015

Datta, S., & Sahu, T. N. (2021). Impact of microcredit on employment generation and empowerment of rural women in India. *International Journal of Rural Management*, *17*(1), 140–157. https://doi.org/10.1177/0973005220969552

Datta, S., & Sahu, T. N. (2022a). Livelihood transformation through microfinance: an empirical investigation on tribal entrepreneurs in India. *International Journal of Business Innovation and Research*, *29*(1), 127. https://doi.org/10.1504/ijbir.2022.125671

Datta, S., & Sahu, T. N. (2022b). How Far is Microfinance Relevant for Empowering Rural Women? An Empirical Investigation. *Journal of Economic Issues*, *56*(1), 97–112. https://doi.org/10.1080/00213624.2022.2019552

Deekor, H. L., & Emanerame, F. B. (2022). Influence of adult functional literacy and vocational skills acquisition programmes on poverty reduction among rural women in Delta State., Nigeria. *International Journal of Modern Innovation and Knowledge, 2*(4), 11–22.

Diamantopoulos, A., Riefler, P., & Roth, K. P. (2008). Advancing formative measurement models. *Journal of Business Research, 61*(12), 1203–1218. https://doi.org/10.1016/j.jbusres.2008.01.009

Eldred, J., Robinson-Pant, A., Nabi, R., Chopra, P., Nussey, C., & Bown, L. (2014). Women's right to learning and literacy: Women learning literacy and empowerment. *Compare*, *44*(4), 655–675. https://doi.org/10.1080/03057925.2014.911999

Fincham, D., Schickerling, J., Temane, M., Nel, D., De Roover, W., & Seedat, S. (2008). Exploratory and confirmatory factor analysis of the Multidimensional Anxiety Scale for Children among adolescents in the cape town metropole of South Africa. *Depression and Anxiety*, *25*(11), E147–E153. https://doi.org/10.1002/da.20406

G, S., & K, S. (2020). Role of Shgs financial empowerment of Scheduled Caste women – A study of Scheduled Caste reserved & unreserved constituencies of erstwhile Karimnagar District of Telangana. *International Journal of Research -Granthaalayah, 8*(5), 365–382. https://doi.org/10.29121/granthaalayah.v8.i5.2020.75

Ganle, J. K., Afriyie, K., & Segbefia, A. Y. (2015). Microcredit: Empowerment and disempowerment of rural women in Ghana. *World Development, 66*, 335–345. https://doi.org/10.1016/j.worlddev.2014.08.027

Gautam, S. (2024). Socio-economic empowerment of women through microfinance: A case study of Baijnath Rural Municipality, Banke. *Voice: A Biannual & Bilingual Journal*. https://doi.org/10.3126/voice.v16i2.72774

Girard, T. (2021). Explaining the origins and evolution of the global financial inclusion agenda. Electronic Thesis and Dissertation Repository. 7921. https://ir.lib.uwo.ca/etd/7921

Gopalaswamy, A. K., Babu, M. S., & Dash, U. (2016). *Systematic review of quantitative evidence on the impact of microfinance on the poor in South Asia*. EPPI-Centre, Social Science Research Unit, Institute of Education, University College London.

Guérin, I. (2014). Juggling with debt, social ties, and values. *Current Anthropology, 55*(S9), S40–S50. https://doi.org/10.1086/675929

Hair, J. F., Ringle, C. M., & Sarstedt, M. (2011). PLS-SEM: Indeed a silver bullet. *Journal of Marketing Theory and Practice, 19*(2), 139–151.

Hair, J. F., Sarstedt, M., Hopkins, L., & Kuppelwieser, V. G. (2014). Partial least squares structural equation modeling (PLS-SEM): An emerging tool in business research. *European Business Review, 26*(2), 106–121. https://doi.org/10.1108/EBR-10-2013-0128

Hair, J. F., Black, W. C., Babin, B. J., & Anderson, R. E. (2019a). *Multivariate Data Analysis* (8th ed.). Cengage Learning.

Hair, J. F., Risher, J. J., Sarstedt, M., & Ringle, C. M. (2019b). *When to use and how to report the results of PLS-SEM.. European Business Review*. https://doi.org/10.1108/ebr-11-2018-0203

Hashemi, S. M., Schuler, S. R., & Riley, A. P. (1996). Rural credit programs and women's empowerment in Bangladesh. *World Development, 24*(4), 635–653. https://doi.org/10.1016/0305-750X(95)00159-A

Hazra, A., Atmavilas, Y., Hay, K., Saggurti, N., Verma, R. K., Ahmad, J., Kumar, S., Mohanan, P., Mavalankar, D., & Irani, L. (2019). Effects of health behaviour change intervention through women's self-help groups on maternal and newborn health practices and related inequalities in rural India: A quasi-experimental study. *EClinicalMedicine, 18*, Article 100198. https://doi.org/10.1016/j.eclinm.2019.10.011

Henseler, J., Ringle, C. M., & Sarstedt, M. (2014). A new criterion for assessing discriminant validity in variance-based structural

equation modeling. *Journal of the Academy of Marketing Science*, *43*(1), 115–135. https://doi.org/10.1007/s11747-014-0403-8

Hietalahti, J., & Linden, M. (2006). Socio-economic impacts of microfinance and repayment performance: A case study of the Small Enterprise Foundation, South Africa. *Progress in Development Studies, 6*(3), 201–210. https://doi.org/10.1191/1464993406ps138oa

Hoffmann, V., Rao, V., Surendra, V., & Datta, U. (2020). Relief from usury: Impact of a self-help group lending program in rural India. *Journal of Development Economics, 148*, Article 102567. https://doi.org/10.1016/j.jdeveco.2020.102567

Holvoet, N. (2005). The Impact of Microfinance on Decision-Making Agency: Evidence from South India. *Development and Change*, *36*(1), 75–102. https://doi.org/10.1111/J.0012-155X.2005.00403.X

Ingram, K. L., & Nitsenko, V. (2021). Comparative analysis of public management models. *Naukovij Vìsnik Nacìonal'nogo Gìrničogo Unìversitetu, 4*, 122–127. https://doi.org/10.33271/nvngu/2021-4/122

Jayachandran, S. (2021). Social norms as a barrier to women's employment in developing countries. *IMF Economic Review*, *69*(3), 576–595. https://doi.org/10.1057/s41308-021-00140-w

Joseph, M. K. (2013). Critical theory for women empowerment through ICT studies. *Qualitative Research Journal, 13*(2), 163–177. https://doi.org/10.1108/QRJ-01-2013-0002

Kabeer, N. (1999). Resources, agency, achievements: Reflections on the measurement of women's empowerment. *Development and Change*, *30*(3), 435–464. https://doi.org/10.1111/1467-7660.00125

Kabeer, N. (2005). Is microfinance a Magic Bullet for women's empowerment? Analysis of findings from south Asia. *Economic and Political Weekly*, *40*(44/45), 4709–4718. www.jstor.org. https://www.jstor.org/stable/4417357

Kabeer, N., Eyben, R., & Cornwall, A. (2008). Conceptualising empowerment and the implications for pro-poor growth. IDS Bulletin, September. https://opendocs.ids.ac.uk/opendocs/handle/20.500.12413/7203

Karlan, D. S., & Zinman, J. (2009). Expanding microenterprise credit access: Using randomized supply decisions to estimate the impacts in Manila. *SERN Electronic Journal*. https://doi.org/10.2139/ssrn.1444990

Khan, S. T., Bhat, M. A., & Sangmi, M. (2020). Impact of Microfinance on Economic, Social, Political and Psychological Empowerment: Evidence from Women's Self-help Groups in Kashmir Valley, India. *FWIB Business Review*, *12*(1), 5873. https://doi.org/10.1177/2319714520972905

Khandare, D. M., & Gajanan, R. D. (2016). A study of microfinance and women empowerment in rural development in India. *BVIMSR's Journal of Management Research, 8*(Suppl. Special Issue), 14–20.

Khandelwal, A. K. (2007). March 31). Microfinance Development Strategy for India. *Economic and Political Weekly*, *43*(13).

Khandker, S. R. (2005). Microfinance and poverty: Evidence using panel data from Bangladesh. *The World Bank Economic Review*, *19*(2), 263–286. https://doi.org/10.1093/wber/lhi008

Kilby, P. (2010). *NGOs in India: The challenges of women's empowerment and accountability*. Routledge. https://doi.org/10.4324/9780203842720

Kline, R. B. (2016). *Principles and Practice of Structural Equation Modeling* (4th ed.). The Guilford Press.

Kochar, A., Nagabhushana, C., Sarkar, R., Shah, R., & Singh, G. (2022). Financial access and women's role in household decisions: Empirical evidence from India's National Rural Livelihoods project. *Journal of Development Economics*, *155*, 102821. https://doi.org/10.1016/j.jdeveco.2022.102821

Kumar, N., Raghunathan, K., Arrieta, A., Jilani, A., & Pandey, S. (2021). The power of the collective empowers women: Evidence from self-help groups in India. *World Development*, *146*, 105579. https://doi.org/10.1016/j.worlddev.2021.105579

Maîtrot, M. (2021). The Moral Economy of microfinance in Rural Bangladesh: Dharma, gender and Social change. *Development and Change*, *53*(2), 335355. https://doi.org/10.1111/dech.12700

Maity, S. (2023). Financial inclusion also leads to social inclusion—myth or reality? Evidences from self-help groups led microfinance of Assam. *Journal of Innovation and Entrepreneurship*. https://doi.org/10.1186/s13731-023-00307-x

Mathur, P., & Agarwal, P. (2017). Self-help groups: A seed for intrinsic empowerment of Indian rural women. *Equality Diversity and Inclusion an International Journal*, *36*(2), 182–196. https://doi.org/10.1108/edi-05-2016-0039

Mehta, K. M., Irani, L., Chaudhuri, I., Mahapatra, T., Schooley, J., Srikantiah, S., Abdalla, S., Ward, V. C., Carmichael, S. L., Bentley, J., Creanga, A., Wilhelm, J., Tarigopula, U. K., Bhattacharya, D., Atmavilas, Y., Nanda, P., Weng, Y., Pepper, K. T., & Darmstadt, G. L. (2020). Health impact of self-help groups scaled-up statewide in Bihar. *India PubMed*, *10*(2), 021006. https://doi.org/10.7189/jogh.10.021006

Mengstie, B. (2022). Impact of microfinance on women's economic empowerment. *Journal of Innovation and Entrepreneurship*. https://doi.org/10.1186/s13731-022-00250-3

Michie, B. H. (1978). Baniyas in the Indian agrarian economy: A case of stagnant entrepreneurship. *The Journal of Asian Studies, 37*(4), 637.

Morduch, J. (1995). Income smoothing and consumption smoothing. *Journal of Economic Perspectives*, *9*(3), 103–114. https://doi.org/10.1257/jep.9.3.103

Nichols, C. (2021). Self-help groups as platforms for development: The role of social capital. *World Development, 146*, Article 105575. https://doi.org/10.1016/j.worlddev.2021.105575

Pandhare, A., Bellampalli, P. N., & Yadava, N. (2024). Transforming rural women's lives in India: The impact of microfinance and entrepreneurship on empowerment in Self-Help Groups. *Journal of Innovation and Entrepreneurship*. https://doi.org/10.1186/s13731-024-00419-y

Pitt, M. M., Khandker, S. R., & Cartwright, J. (2006). Empowering women with microfinance: Evidence from Bangladesh. *Economic Development and Cultural Change, 54*(4), 791–831. https://doi.org/10.1086/503580

Putnam, R. D. (2000). *Bowling alone: The collapse and revival of American community*. Simon & Schuster.

Quan-Baffour, K. P. (2012). The liberative power of education: Adult basic education as empowerment tool for rural women in Taung. *Studies of Tribes and Tribals, 10*(2), 91–97. https://doi.org/10.1080/0972639x.2012.11886646

Raghavendra, T. S. (2001). Performance evaluation of self help groups: A case study of three groups in Shimoga district. *Indian Journal of Agricultural Economics*, *56*(3), 466–467.

Raghunathan, K., Kumar, N., Gupta, S., Thai, G., Scott, S., Choudhury, A., Khetan, M., Menon, P., & Quisumbing, A. (2022). Scale and Sustainability: The impact of a women's Self-Help Group program on Household Economic Well-Being in India. *The Journal of Development Studies*, *59*(4), 490–515. https://doi.org/10.1080/00220388.2022.2154151

Saha, S., Kermode, M., & Annear, P. L. (2015). Effect of combining a health program with a microfinance-based self-help group on health behaviors and outcomes. *Public Health*. https://doi.org/10.1016/j.puhe.2015.07.010

Sahu, T. N., Agarwala, V., & Maity, S. (2021). Effectiveness of microcredit in employment generation and livelihood transformation of tribal women entrepreneurs: Evidence from PMMY. *Journal of*

Small Business & Entrepreneurship, *36*(1), 53–74. https://doi.org/10.1080/08276331.2021.1928847

Schuler, S. R., Hashemi, S. M., & Riley, A. P. (1997). The influence of women's changing roles and status in Bangladesh's fertility transition: Evidence from a study of credit programs and contraceptive use. *World Development*, *25*(4), 563–575. https://doi.org/10.1016/S0305-750X(96)00119-2

Sehrawat, M., & Giri, A. (2017). Does female human capital contribute to economic growth in India? an empirical investigation. *International Journal of Social Economics*, *44*(11), 1506–1521. https://doi.org/10.1108/ijse-10-2015-0272

Sen, A. (1999). *Development as Freedom.* Oxford University Press.

Sengupta, N. (2013). Poor Women's Empowerment: The discursive space of microfinance. *Indian Journal of Gender Studies*, *20*(2), 279–304. https://doi.org/10.1177/0971521513482220

Shaheen, I., Hussain, I., & Mujtaba, G. (2018). Role of Microfinance in Economic Empowerment of Women in Lahore, Pakistan: A Study of Akhuwat Supported Women Clients. *International Journal of Economics and Financial Issues*, *8*(4), 337–343.

Sharma, B. (2017). Status of micro finance in Rajasthan: Problems and prospects. *EPRA International Journal of Economic and Business Review*, *5*(7), 56–46. https://www.eprawisdom.com

Shylendra, H. S. (2004). The SHG-Bank linkage programme: An assessment and future strategies. *Journal of rural development*, *10*(23), 411–433.

Stromquist, N. P. (2006). Women's rights to adult education as a means to citizenship. *International Journal of Educational Development*, *26*(2), 140–152. https://doi.org/10.1016/j.ijedudev.2005.07.021

Subramaniam, M. (2011). Grassroots groups and poor women's empowerment in rural India. *International Sociology*, *27*(1), 72–95. https://doi.org/10.1177/0268580911423044

Suprabha, K. (2014). Empowerment of Self Help Groups (SHGs) towards Microenterprise Development. *Procedia Economics and Finance*, *11*, 410–422. https://doi.org/10.1016/s2212-5671(14)00208-1

Swain, R. B., & Wallentin, F. Y. (2009). Does microfinance empower women? Evidence from self-help groups in India. *International Review of Applied Economics*, *23*(5), 541–556. https://doi.org/10.1080/02692170903007540

Tara, S. (2016). Micro Finance in India. *BVIMSR's Journal of Management Research*, *Suppl.Special Issue*(8), 92–101. https://www.proquest.com/scholarly-journals/micro-finance-india/docview/1959185804/se-2 Retrieved from.

Tobi, H., & Kampen, J. K. (2018). Research design: The methodology for interdisciplinary research framework. *Quality and Quantity*, *52*(3), 1209–1225. https://doi.org/10.1007/s11135-017-0513-8

Ugiagbe, E. O., & South-South (2014). *Nigeria International Journal of Finance & Banking Studies* (2147–4486), 3(2), 28–47. https://doi.org/10.20525/ijfbs.v3i2.182.

Wellalage, N. H., & Thrikawala, S. (2021). Bank credit, microfinance and female ownership: Are women more disadvantaged than men? *Finance Research Letters*, *42*, 101929. https://doi.org/10.1016/j.frl.2021.101929

Woller, G. W. G. (2002). The promise and peril of microfinance commercialization. *Enterprise Development and Microfinance*, *13*(4), 12–21. https://doi.org/10.3362/0957-1329.2002.042

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