



Sustainability Goal and Women Empowerment through Women Education and Microcredit Facility in Pakistan

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ABSTRACT

The purpose of the study is to explore the objective such as Sustainability goals and women empowerment through women education and women empowerment's role in country development. To attain the objective of the study, we used the primary data through questionnaire collected from women located in Pakistan that attain the micro-credit facility. The Smart Partial least squares (PLS) method is used as method of estimation in the study. Our findings show that microfinance credit services have significant positive relationship with women empowerment. The microfinance credit services have significant positive relationship with women education. The women education has significant positive relationship with women empowerment. Moreover, our results indicating the significant positive mediating relationship of women education. We concluded that the microfinance credit along with education improve the women empowerment because the education is the integral part to decide the investment decision accurately that boost the women empowerment with credit facility. Moreover, this study advocated the significant implications for investors, government and legislators to improve the women empowerment in the country that leads to economic development. Investors make investment in microcredit to facilitate the women through education and can protect the investment with secure repayment pattern.

Keywords: Microcredit, Women Empowerment, Women Education, Pakistan

JEL Classifications: I25, I38, J16, O15, Q01, G21

1. INTRODUCTION

Women Empowerment is a challenging issue for the developing countries in present world, where gender inequalities persist and women stay restrictedly inside their houses, taking care of all the liabilities of the household and are unable to take part in the economic activities of the country (Finch and Groves, 2022). It is a crucial need for the economy to attain the sustainability development goals (SDGs) and the development of the country. Indicators associated with achieving "gender equality" in education figure centrally in the United Nation's Sustainable Development Goal 4 (SDG 4), the education goal (Saini et al., 2023). In this paper, I focus particularly on the impact of education as an agent of change, and one of the measures of the status of women in Pakistani society. The Pakistan has approximately 249.6 million populations as of May 2023, of which 49.6% is a female.

The country needs to meet 17 UN Sustainable Development Goals (SDGs) to become a developed country. Pakistan, as a developing country, has achieved significant improvement in increasing school enrolments and literacy rates (Zakar et al., 2020). Numerical empirical evidence establishes the relationship between education and women empowerment. Education plays a crucial role in achieving gender parity and women empowerment (Wang et al., 2024). Educated women ensure better health care, decrease in the population growth, increment in food production, promote financial solvency and assist poverty reduction (Qibthiyyah and Utomo, 2016), and women empowerment stimulates the economic growth of the country (Saqib and Economics, 2016).

Several researchers indicate that education has a strong positive correlation with women empowerment and reducing the gender gap. Knowledge is essential for women to participate

in employment and to realize and overcome the challenges surrounding them (Adefare et al., 2024). In developing countries like Pakistan, female participation in secondary schooling can minimize due to arranging early marriages, obtaining insight regarding the experiences of the world, and rising the social experience of the girls and their families (Khan, 2024).

Education has been of central significance to the development of human society. It can be the beginning, not only of individual knowledge information and awareness, but also of a holistic strategy for development and change. Education helps an individual to develop his potential to the full, to increase his productivity and to become a useful and productive member of society (Sofia et al., 2023). Education is holistic in concept and is multi-dimensional. The importance of education can be interpreted from the reply to the question asked by Aristotle (Sofia et al., 2023). The question asked was “How much better educated men were than those who were uneducated.” The reply was, “As much as the living are than the dead” (Goel, 2009). Women are active in a variety of economic area, which they often combine ranging from wage labour and subsistence farming and fishing to the informal sector (Amu, 2005). Women contribute to development not only through remunerated work but also through a great deal of unremunerated work.

On the one hand, women participate in the production of goods and services for the market and household consumption, in agriculture, food production or family enterprises. Alternatively, women still also perform the great majority of unremunerated domestic work and community work such as, caring for children and older persons, preparing food for the family, protecting the environment and providing voluntary assistance to vulnerable and disadvantaged terms and are not valued in national accounts. Women’s contribution to development is seriously underestimated, and thus its social recognition is limited (Boserup et al., 2013).

1.1. Education is Necessary for Women

This study is an attempt to examine the concept of empowerment of women in the wider context. The study of women empowerment will help us to understand the importance of education in a life of a woman as a normal human being. This study will strongly impact on the education about the undergraduate women for their own empowerment. It will help them to understand the importance of empowerment and to find the reasons, “why they need empowerment?” Empowerment is envisaged as an aid to help women to achieve equality with men or at least to reduce gender gap considerably (Razavi and Development, 2016). Empowerment would enable women to perform certain social roles which they cannot perform without it. In the Indian situation, this would mean helping women to enjoy their constitutional and legal rights to equality (Mokta, 2014).

Women empowerment also increases the ratio of political equality, which includes not only the equal rights to franchise but also the more important rights to gain access to the formal institutionalized centers of power (Paxton et al., 2020). It is often strongly argued that education is a powerful tool in the empowerment of women Economic independence or

self-generated income is considered as the major means of empowerment of women (Mutua and Juster, 2021). Thus, the prevailing value system has put so many hurdles on the path to women’s equality through economic empowerment.

1.2. Importance of Women Empowerment

Empowerment is a very broad term encompassing all type of empowerment such as education economic, social, political, legal psychological and cultural empowerment of women (Al-Qahtani et al., 2020). The world declaration in world conference in 1990 laid emphasis on “education of all lays stress on universalizing access and promoting equity the two issues which are vital to empowerment of women” (Mundial and Unicef, 2016). The process of women empowerment is thus concerned with changing the power relations between individuals and groups in the society and involves awareness raising building of self-confidence, expansion of choice, involvement in decision making and increased access to and control over resources unless they themselves become conscious of the oppression met out to them and show initiative both to push forward (Mandal, 2013). It can create an opportunity to change their status much.

1.3. Problems Statement

According to World Bank indicators 2019, in the Pakistan literacy rate are 58% in which 69.29% male and 46.49% female, that are not acceptable for the developing country that wants rapidly economic and financially development (Manzoor et al., 2022; Page). The study argues that the inter-relationships of the empowerment and development are probably too weak to be self-sustaining, and that continuous policy commitment to equality for its own sake may be needed to bring about equality between men and women. Several researchers indicate that education has a strong positive correlation with women empowerment and reducing the gender gap.

Education is necessary for women to participate in employment and to realize and overcome the challenges surrounding them (Adefare et al., 2024). Women play vital role in every sector in the development country, it’s not probable without women empowerment. We can observe that in developing countries miss use laws and relegations and they are not applicable in the societies. Therefore, the crime rate about female like as harassment on job, rape, blackmailing and abusing like as so many other in developing countries more the development countries. The developing countries should be special focus on women education and her empowerment (Akudolu et al., 2023). It’s observing that in developing counties ignore the role of women in state development. Hence, this research intends to fulfill the gap and to investigate the role of education in empowerment of women in Pakistan.

1.4. Research Question

- How does education play any significant role in women’s empowerment?
- Does economic, psychological, legal, socio-cultural have any association with women empowerment?
- What is the effect of women’s empowerment in country development?

1.5. Objective of Research

In present study the objective to examine the women empowerment with mediator impact of education of female in Pakistan. An educated female gets better decision than non education female, numerous research have carried out to identify the role of education in women empowerment. Ours other objectives of ours research the role of economic empowerment, psychological empowerment, legal empowerment, and socio-cultural empowerment in women empowerment; and at last, we check the performance of women empowerment for the country development. However, that research did not cover the effect of different levels of schooling on women empowerment and cover only a few areas. Hence, this research intends to fulfill the gap and to investigate the role of education in empowerment of women in whole Pakistan.

2. LITERATURE REVIEW

Several previous studies on empowerment define the term empowerment. It is the means that make the unable person achieving the capability to form essential choices about their life choices (Sabir et al., 2023). The term empowerment means the increase of resources and abilities of is advantaged people to engage in, bargain with, control, direction, and hold responsible organizations that influence the lives of these poor people (Nassar et al., 2023). The empowerment varies significantly in both operational and analytic terms. The literature has emphasized education as a fundamental and egalitarian human right. For example, limited access to education in Zimbabwe has been shown to be a barrier to entrepreneurship amongst rural women (Nhuta and Mukumba, 2017), promoting inequalities between women and men. In this case, culture is seen as a barrier to self-confidence and economic autonomy amongst women (Aparicio et al., 2022). The relationship between education and entrepreneurship is one of the factors that is relevant to female entrepreneurship, and over the years, it has been investigated by various authors. Some authors have suggested that education emphasizes management skills, allowing female entrepreneurs to evaluate entrepreneurial opportunities more effectively (Avnimelech and Rechter, 2023; Hatthakijphong et al., 2019). Other studies have asserted the opposite. Higher levels of education may also offer better-paid employment opportunities and better working conditions, making it less probable that entrepreneurship will be the most desirable option (Tambunan and Economics, 2009; Jones et al., 2023).

However, the most important point is to have the opportunity to access education because education is one of a number of structural barriers, including the lack of marketable skills, the time and ability to travel, and family providers, which aggravate the problem of entrepreneurship amongst women in developing countries (Aparicio et al., 2022; Boserup et al., 2013). Studies conducted in other emerging economies, such as Turkey, Bangladesh, Ethiopia, Indonesia, and Sri Lanka, have shown that entrepreneurial activity amongst women is also correlated with their level of education and the educational level attained by their husbands (Aparicio et al., 2022).

In general, empowerment addresses an individual's capacity to gain power and control over decisions and resources that affect

her life (Ani et al., 2018). The role of rapidly rising educational attainment among young women in raising their relative position in the labour market and suggests that the educational trends have not contributed towards a decline in the full-time employment gap (Biewen et al., 2018). Whereas some scholars define empowerment of women as the capability of women to be financially independent and able to dominate above judgments influencing the choices of life and independence against the brutality (Guérin et al., 2013; Akram, 2018).

The intentional that how higher education offers empowerment to women. The economic independence and increased standing with the family were the benefits of higher education. It also enabled the women to impact the discriminatory practices (Wang et al., 2024; Ahmed and Hyndman-Rizk, 2020). The explored the possibilities and opportunities for women empowerment and how the participants in the study understand the role of higher education in empowerment of women at home and at work (Mulema, 2018; Pasque and Nicholson, 2023). They found out that the women should continue higher education and career by strategizing and acknowledging the support of their family members. The empowerment of women through higher education. She concluded that the empowered women challenged the man in their workplace and were seen in the powerful corporate positions (McCarthy, 2017). Some reviewed the participation in community level female empowerment program in India increases participants physical motility, political participation and access to employment (Brody et al., 2017). He examined the challenges faced by the women were harassment at workplaces and workload. The parents didn't spend similar amount in educating their daughters as compared to their sons. He found that the status of women in the present society, attitude of parents and guardians towards girl education (Sandhya and Humanities, 2015). The disparity in education across the socio-economic spectrum.

The dropout rate of girls after primary education is higher than boys and this gap increases in rural areas. The main reason of this difference is due to economic pressures, which in the Pakistan patriarchal setting affect girl children more than boys (Qureshi, 2012), because sons are the priority for probable 'investment' due to their prospective role as future principal earners (Reetha, 2023). Another reason to invest in boy's education is that the girls are visualized as "temporary" residents of the family, expected to be married and become part of another family.

Therefore, the "male members of the family are given a better education and are equipped with skills to compete for resources in the public arena, while female members are imparted domestic skills to be good mothers and wives (Mehmood et al., 2018). The social and the economic benefits of female education and emphasize on giving importance on the ways through which women's schooling leads to social gains. Well, resourcing the education system in Pakistan remains a major hurdle. Accounts relating to primary and secondary schools in 2019-20 in Punjab paint a bleak picture (Bhatti et al., 2022). Items lacking in considerable numbers include basics like buildings, drinking water, electricity, latrines and furniture (Malik et al., 2011).

These shortcomings are more pronounced and more common in rural areas, but not entirely absent from urban ones (Malik et al., 2011). The medium of instruction adds another dimension to the complexity of Pakistan's education system. Urdu is predominantly used in schools; some elite private institutions use English as a medium of instruction, while others teach in regional minority languages (Ashraf et al., 2021; Asif et al., 2020). The names six major languages spoken in Pakistan, alongside some 57 minor ones (Malik et al., 2011; Coleman, 2010). Urdu is the national language of Pakistan and an important symbol of national cohesion. A major dilemma is that whilst Pakistan wishes to preserve its rich cultural heritage and the regional languages associated with it, there is also a perceived need to promote English within the schools, which is seen as the international language dominating the global market (Bacha et al., 2021).

Against this background of an education system full of challenges for educational planners and reformers, being additionally and further disadvantaged on the grounds of gender is of great concern. The points out that primary school enrolment rates for girls are amongst the ten lowest in the world. Dropout rates for girls in schools are much higher than those of boys (Shahidul et al., 2015). Gender disparities at secondary level are greater than at primary level (Borgonovi and Greiff, 2020).

The current political environment undoubtedly promotes women's educational opportunities, but cultural attitudes towards the education of girls remain strongly biased and largely unchanged. Although successive governments have announced various programs to promote female education, they have been unable to translate their words into action because of deep-rooted political, social and cultural obstacles (Awoleye et al., 2022). Thus, the educational status of women in Pakistan remains low and is in fact amongst the lowest in the world. Women in Pakistan do not form a homogeneous group, and their opportunities for education vary greatly, depending on the social system of which they are a part (Taj, 2024). In rural areas, patriarchal structures often combine with poverty to limit educational opportunities for girls (Porter and Culture, 2011). In contrast, girls and young women belonging to the upper and middle classes in urban areas have increasingly greater access to education and employment opportunities (Sadaf et al., 2024).

The role of higher education as a powerful instrument and mediator of social change has been highlighted (Porter and Culture, 2011). But higher education enrolment in Pakistan is ranked amongst the lowest in the world; in 2005, it was just 2.9% of the population between the ages of 17 and 23 (Javed et al., 2020). Compare this to higher education participation in other developing countries, such as India and Korea, which stand at 10% and 68% respectively (Welch, 2024). One of the major reasons for the lack of progress may lie with the fact that in 2006-07, Pakistan was spending only 2.5% of its GDP (Gross Domestic Product) on education (Bari et al., 2016), which is considerably below the South-Asian regional average and UNESCO's recommendation of four per cent. Other reasons include the rising cost of education and high population growth rates. At the end of literature study, we able to find out the following.

- H₁: There is a positive and significant relationship between microfinance credits services and women empowerment.
- H₂: There is a positive and significant relationship between microfinance credits services and women education.
- H₃: There is a positive and significant relationship between women education and women empowerment.
- H₄: There is a positive and significant mediation impact of women education on the relationship between microfinance credits services and women empowerment.

3. RESEARCH DESIGN

As the present study tries to find out the impact of modern education in the women of rural areas as well as city corporation area of Multan division, it falls under the descriptive survey category of education research. This study will also focus on the facilities provided for women empowerment in City Corporation and rural area development in different parts of Pakistan.

Data was collected from primary sources. A questionnaire of 470 inquiries were presented by investigator and presented to the age group 20-50 years women of different families of Multan division. Here are three villages each from Multan, Ladhnan, Vehari and Khanewal districts, that in which Multan division. From each District respondents were selected for survey and total of 470 respondents answered the inquiries. Data were analyzed by the percentage of respondents.

3.1. Methodology

The purpose of the study was to gain a greater understanding of the sense of empowerment achieved by women in Pakistan through participation in women education. The current study's population was educated female that educated from deferent educational institutions. A self- administered questionnaire was used to gather the responses from 470 educated females through a simple random sampling technique. The 470 respondent's female that belong to Pakistan, whereas 470 were from government and private schools and college. The demographic information of respondents is presented in Table 1.

The current study's population women take the loan from different microfinance credits institutions listed in state bank of Pakistan. The microfinance credits institutions have different method of loaning to female that provide the loan to female for business purpose small and medium scale. The institutions have inconsequential level of grantee for loan returns from borrowers. The study used questionnaires to collect relevant information. The use of questionnaires offered objective responses since they gather data in standardized way (Salloum et al., 2023). Moreover, South Punjab is taken as a sample from total population of the country on the ground of the different reasons. The first reason is the lowest literacy rate in the area. Secondly, people of the south Punjab have faced many disasters such as floods every year due to change in the environment. Moreover, the female are sources as sample on the ground of the victim of the ruler system in Punjab where the women consider only the housewife but there is lack of the awareness about the women empowerment. Therefore, we also aimed to provide the policy implications for the government

Table 1: Demographic information

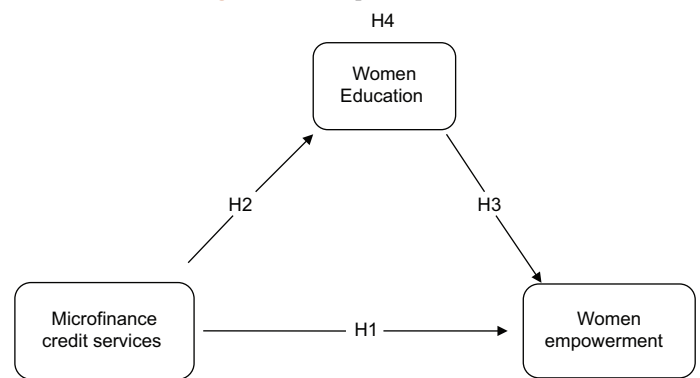
Response	Frequency	Percentage
Education		
Middle level	203	52.9
High School	53	13.8
Intermediate level	40	10.4
Graduate level	80	20.8
Others	8	2.1
Marital status		
Single	89	23.2
Married	239	62.2
Divorced/ Separated	55	14.3
Age		
20-25 year	94	24.5
26-30 year	67	17.4
31-35 year	60	15.6
36-40 year	62	16.1
More than 40	99	25.8
Monthly income		
20,000	152	39.6
25,000	112	29.2
35,000	63	16.4
40,000	27	7.0
More than 40,000	30	7.8
Family type		
Joint family	81	21.1
Nuclear family	302	78.6
Family size		
2	19	4.9
3	31	8.1
4	60	15.6
5	76	19.8
More than 5	198	51.6
Total respondent	384	100%

to make strong measures to empower the women in that area. Moreover, another motive is to create the motivation for other women to participate in their enhancement skills. Figure 1 shows the conceptual framework of the study.

3.2. Variable Measurement

Measurements used in this study were adopted from the literature, more particularly. The main thing being analyses in a study is called the unit of analysis. What or person is being studied is the subject. Individuals (most frequently), groups, social organizations, and social artifacts are typical units of analysis in social science research (Blanche et al., 2006). As was already indicated, the sample for this study consists of specific female borrowers of microcredit from microfinance organizations in Pakistan. As a result, the female individual (microfinance institutes) is the unit of analysis in this study, which may be able to provide a better overall picture and blueprint of the performance of female empowerment. Microfinance credit was measured by five items adopt from and 5 likerts scales used by (Mwashiuya et al., 2020; Kumari, 2021).

The various dimension along with their description and items used to measure women empowerment on five-point Likert scale was used in research (Sharaunga et al., 2019). The questionnaires were designed in the Likert scale of five points. An administered questionnaire was used to gather the responses from 384 female loan borrowers that get the loan for business purpose and select

Figure 1: Conceptual framework

the respondent through a simple random sampling technique. The respondents were asked to rate their responses on 5 points Likert scale.

3.3. Data Analysis and Findings

Third-generation multivariate PLS-SEM was used to analyze the data (Mbawuni et al., 2015). PLS-SEM is suitable for forecasting and can handle complex models with various structural relationships, provide precision for PLS-SEM estimation with larger sample sizes, works well with single and multi-item measures, and also efficiently works with both reflective and formative measurement models (Sarstedt et al., 2022). All latent variables were reflected in this study. Firstly, the reliability and validity of measures were estimated via the measurement model, and in the next step, path coefficient and the significance were evaluated through the structural model.

The demographic information of respondents is presented in Table 1. The education profile of respondents' female shows that that middle level 203, high school 53, intermediate level 40, and graduate level 80 and other education level 8, and women marital status are single women are 89, married women are 239 and divorce/separated women are 55. And age of women between 20 and 25 years 94, between of 26 and 30 years 67, between of 31 and 35 years are 60, between of 36 and 40 years are 62 and more of 40 years are 99. While females' monthly income that have 20,000 are 152, 25,000 income female was 112, 35,000 was female was 63, 40,000 monthly income female was 27 and more then 40,000 was female 30. And the 81 females have jointly system, and 302 females have nuclear family system. Same as family size that women have 2 persons in family was the 19 women, women have that 3 person in family was the 31 women, women have 4 persons in family was the 60 women, women have 5 persons in family was the 76 women and women have more the 5 persons in family was the 198 women.

For the reflective measurement model shown in Figure 2, the reliability and validity of measures were evaluated. More specifically, the indicator reliability of all studied constructs was assessed through outer loading. The standardized value of the outer loading of each item was >0.60 (Purwanto and Research, 2021). In this study, the value of all outer loading was higher than the threshold value except for HED4, ES3, MOL2 and FD4 which exclude from the final data.

In the next step, the internal consistency was assessed through Cronbach's alpha value. The value must be greater than the threshold of 0.70 (Al-Emran et al., 2019), and the results show that the values shown in Table 2 were between 0.716 and 0.882, and hence, internal consistency is established in the current study.

Another criterion used to evaluate the internal consistency reliability was composite reliability. The threshold value of the

composite reliability coefficient should be higher than 0.70. The composite reliability (CR) values ranged between 0.772 and 0.914 presented in Table 2 indicating a satisfactory level of internal consistency.

For the estimation of convergent validity, the average variance extracted (AVE) was recommended (Cheung et al., 2023). All studied constructs' outer loading and AVE values were employed

Figure 2: Measurement model

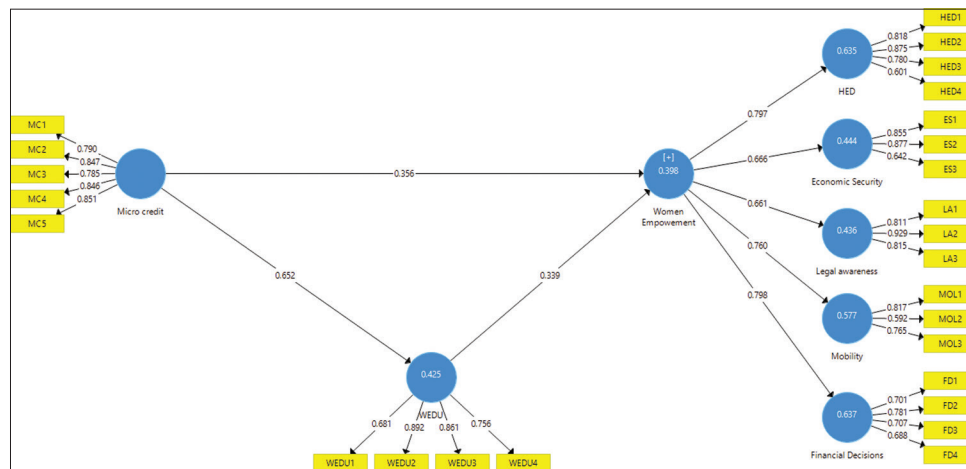


Table 2: Assessment of reflective model

Variable	Item	Loading	α	ρ_{ho_A}	Composite reliability	AVE
Economic Security	ES1	0.855	0.716	0.769	0.838	0.637
	ES1	0.623				
	ES2	0.877				
	ES2	0.570				
Financial Decisions_	FD1	0.701	0.790	0.693	0.811	0.518
	FD1	0.596				
	FD2	0.781				
	FD2	0.621				
HED	FD3	0.707	0.775	0.809	0.855	0.601
	FD3	0.536				
	HED1	0.818				
	HED1	0.700				
Legal awareness_	HED2	0.875	0.812	0.839	0.889	0.729
	HED2	0.705				
	HED3	0.780				
	HED3	0.601				
Microfinance credit	LA1	0.811	0.882	0.884	0.914	0.680
	LA1	0.551				
	LA2	0.929				
	LA2	0.651				
Mobility	LA3	0.815	0.765	0.617	0.772	0.534
	LA3	0.468				
	MOL1	0.817				
	MOL1	0.688				
Women education	MOL3	0.765	0.810	0.832	0.877	0.643
	MOL3	0.557				
	WEDU1	0.681				
	WEDU2	0.892				
	WEDU3	0.861				
	WEDU4	0.756				

to estimate the convergent validity. Convergent validity is how a measure is related to other constructs and measures of the same variable (Cheung et al., 2023). The AVE value should be >0.50 (Ab Hamid et al., 2017; dos Santos et al., 2023). Findings indicate that all AVE values were higher than the threshold value of 0.50; hence, convergent validity was established. Furthermore, the construct validity was estimated, meaning that every studied construct should be distinctive from other studied constructs (MacKenzie et al., 2011). It is recommended to use the Fornell–Larcker test (Henseler et al., 2015), heterotrait–monotrait (HTMT) ratio (Dirglatmo, 2023), and cross-loadings.

Discriminant validity was estimated through the Fornell–Larcker test (Ab Hamid et al., 2017). From this condition, the value of the square root of AVE should be greater than the correlations with

all other constructs. Table 3 shows the result, which indicates that discriminant validity was established.

The second criterion, HTMT, is recommended for evaluating correlation among latent variables if the value of HTMT is below 1, indicating that the variable is distinctive from other variables (Ab Hamid et al., 2017). All values shown in Table 4 indicate that these were below 1. Therefore, it is concluded that the discriminant validity was established.

Another criterion is employed (women empowerment) for discriminant validity evaluation. Item loading should be higher than items cross-loading (Tiwari et al., 2023). In the current study, the loading of items was higher than their cross-loading. The findings are shown in Table 5. Hence, discriminant validity was established.

In the next step, the structural model was evaluated through bootstrapping shown in Figure 3. Firstly, the co-linearity problem was evaluated through structural model estimation. Collinearity means a higher correlation among the studied variables (Dormann et al., 2013). The variance inflation factor (VIF) was used for the standard criterion. For avoidance collinearity, the value of VIF

Table 3: Fornell–Larcker criterion

Variable	Micro credit	WEDU	Women empowerment
Micro credit	0.824		
WEDU	0.652	0.802	
Women Empowerment	0.576	0.571	0.571

Author source

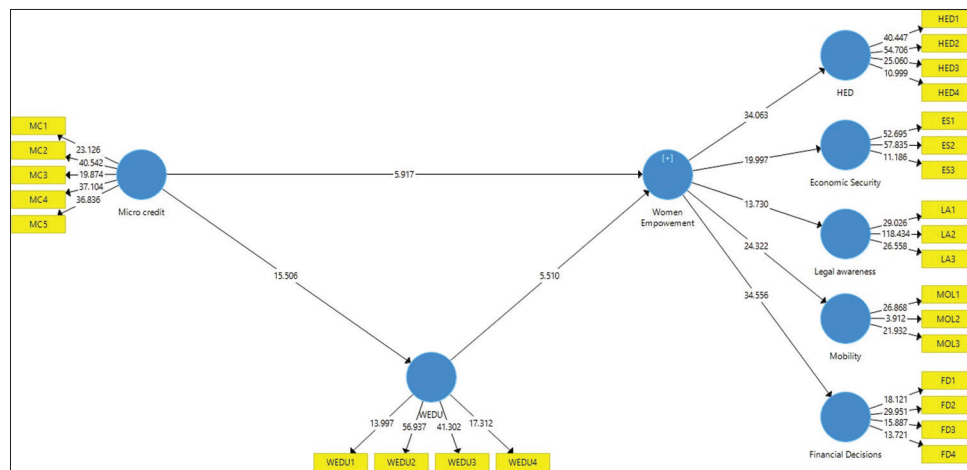
Table 4: HTMT criterion

Variables	Economic security	Financial decisions_	HED	Legal awareness_	Micro credit	Mobility	WEDU_	Women empowerment
Economic Security								
Financial Decisions_	0.701							
HED	0.476	0.673						
Legal awareness_	0.288	0.528	0.483					
Micro credit	0.593	0.566	0.460	0.546				
Mobility	0.668	0.741	0.768	0.521	0.473			
WEDU_	0.431	0.509	0.481	0.693	0.767	0.573		
Women Empowerment	0.851	1.029	0.951	0.771	0.657	1.046	0.668	

Table 5: Cross loading

Items	Economic security	Financial decisions_	HED	Legal awareness_	Micro credit	Mobility	WEDU_	Women empowerment
ES1	0.855	0.485	0.366	0.271	0.463	0.390	0.383	0.623
ES2	0.877	0.455	0.324	0.141	0.380	0.387	0.211	0.570
ES3	0.642	0.248	0.172	0.059	0.288	0.267	0.167	0.356
FD1	0.316	0.701	0.398	0.387	0.344	0.360	0.357	0.596
FD2	0.514	0.781	0.360	0.228	0.329	0.413	0.225	0.621
FD3	0.341	0.707	0.353	0.232	0.303	0.313	0.278	0.536
FD4	0.298	0.688	0.342	0.316	0.297	0.310	0.248	0.539
HED1	0.302	0.459	0.818	0.402	0.239	0.528	0.346	0.700
HED2	0.376	0.463	0.875	0.337	0.360	0.455	0.330	0.705
HED3	0.261	0.361	0.780	0.323	0.327	0.399	0.299	0.601
HED4	0.202	0.236	0.601	0.139	0.250	0.271	0.213	0.414
LA1	0.151	0.336	0.408	0.811	0.327	0.303	0.472	0.551
LA2	0.252	0.427	0.377	0.929	0.484	0.421	0.557	0.651
LA3	0.128	0.246	0.233	0.815	0.368	0.317	0.399	0.468
MC1	0.392	0.342	0.283	0.428	0.790	0.310	0.538	0.470
MC3	0.357	0.335	0.307	0.383	0.785	0.242	0.481	0.441
MC5	0.442	0.390	0.319	0.332	0.851	0.310	0.551	0.482
MOL1	0.337	0.435	0.523	0.475	0.333	0.817	0.485	0.688
MOL2	0.227	0.243	0.275	0.053	0.060	0.592	0.053	0.358
MOL3	0.393	0.357	0.356	0.266	0.353	0.765	0.330	0.557
WEDU2	0.325	0.384	0.408	0.546	0.596	0.433	0.892	0.566
WEDU4	0.310	0.301	0.262	0.313	0.532	0.315	0.756	0.403

Figure 3: Structural model



should be below 5 (Kock and Review, 2015). The results indicate that values ranged between 1.722 and 2.311, which shows that their collinearity was not found in our data.

In the next step, path coefficients of the hypothesized linkage were estimated through the PLS. Algorithm, and their significance was calculated via a standard error by bootstrap test. A value of T-statistics > 1.96 ($P < 0.05$) shows a significant relationship. Next, the coefficient of determination (R^2) was calculated. Values of R^2 are shown in Table 6, showing the level of variance explained by the exogenous variables. The recommends that standard values of R^2 are 0.25 (weak), 0.50 (moderate), and 0.75 (substantial) (Hair et al., 2019).

The relationship between microfinance credits services is positively linked with the women empowerment.

To test mediation, the criterion recommended by (Hair et al., 2016) was used. Women education complementary mediation mediates the path among microfinance credits services and women empowerment. The results indicate that women education mediates the path between microfinance credits services and women empowerment.

Table 7 shows the summary of hypothesis testing. The path coefficient (β) and P-statistics for the hypothesized link between microfinance credits and women empowerment were 0.359 and 0.000, respectively. A $P < 0.05$ indicates that microfinance credits significantly impact the women empowerment. Hence, H_1 is supported.

The path coefficient (β) and P-statistics for the hypothesized link between microfinance credits and women education are 0.651 and 0.000. A $P < 0.05$ indicates that microfinance credits significantly impact the women education (Rahman et al., 2017). Hence, H_2 is supported. Further, the path coefficient (β) and P-statistics for the hypothesized link between women education and women empowerment are 0.333 and 0.000. A $P < 0.05$ indicates that women education significantly impacts the women empowerment. Hence, H_3 is supported. Lastly, the Path coefficient and p-statistics in the mediation of women education between microfinance

Table 6: Summary of structural model assessment

Variables	Sample	Mean	STDEV	T Statistics	P-values
Economic Security	0.444	0.455	0.045	9.932	0.000
Financial Decisions	0.637	0.637	0.037	17.403	0.000
HED	0.635	0.634	0.037	17.109	0.000
Legal awareness	0.436	0.427	0.062	7.022	0.000
Mobility	0.577	0.599	0.048	11.964	0.000
WEDU	0.425	0.425	0.055	7.796	0.000
Women Empowerment	0.398	0.399	0.047	8.548	0.000

credits and women empowerment were 0.079 and 0.000. The $P < 0.05$. This indicates that microfinance credits have a significant relationship with the women empowerment through mediating women education. Hence, H_4 is supported.

Evaluating each predictor construct's effect size (f^2) on the endogenous construct is vital for significant path coefficients (Hair et al., 2019). The effect size (f^2) is employed to estimate the

Changes in the magnitude of R^2 , excluding the predictor's variable from the model. Additionally, f^2 value of 0.02, 0.15, and 0.35 are supposed as small, medium, and large sizes, respectively. The finding shown in Table 8 indicates all f^2 value.

Moreover, the predictive relevance of Q^2 for the evaluation of model quality should be estimated (Hair et al., 2014). The blindfolding test was used to estimate the predictive relevance of Q^2 shown in Figure 4. The value of stone-Geisser's Q^2 was used (Ahmad and Ahmad, 2021). Q^2 values are estimated through the average redundancy index of the dependent variables (Wong, 2013). Moreover, value of f^2 are 0.02 small (S), 0.15 medium (M) and 0.35 medium (M) and large (L) sizes The Q^2 values is shown in Table 9.

4. DISCUSSION ON FINDINGS

In our results micro credit has positive and significant relationship with women education. The positive and significant relationship between microcredit and women's education can be attributed to

Figure 4: Blindfolding test

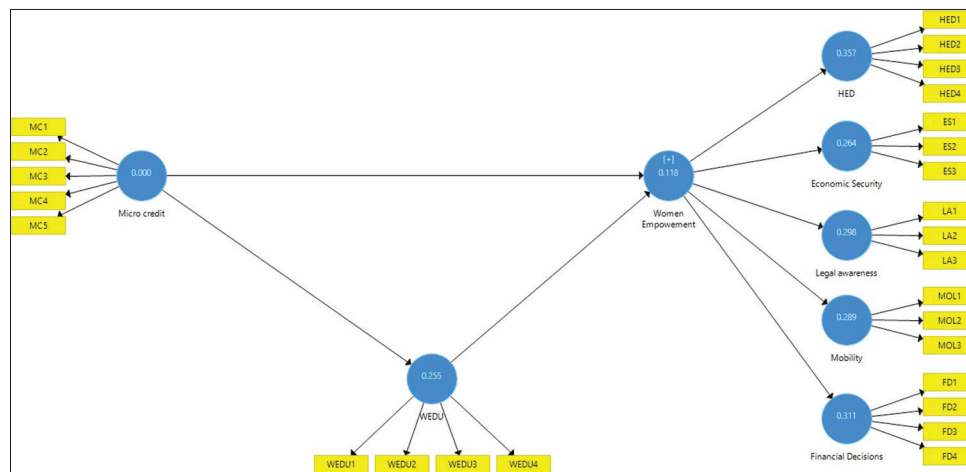


Table 7: Hypothesis testing

Variable path	Beta	Standard error	T Statistics	P-values	Decisions	Confidence Interval	
						2.5%	97.5%
Micro credit -> WEDU_	0.651	0.042	15.506	0.000***	Accepted	0.570	0.724
Micro credit -> Women Empowerment	0.359	0.060	5.917	0.000***	Accepted	0.239	0.479
WEDU_ -> Women Empowerment	0.333	0.061	5.510	0.000***	Accepted	0.209	0.450
Women Empowerment -> Economic Security	0.673	0.033	19.997	0.000***	Accepted	0.598	0.733
Women Empowerment -> Financial Decisions_	0.798	0.023	34.556	0.000***	Accepted	0.748	0.839
Women Empowerment -> HED	0.796	0.023	34.063	0.000***	Accepted	0.749	0.837
Women Empowerment -> Legal awareness_	0.652	0.048	13.730	0.000***	Accepted	0.553	0.736
Women Empowerment -> Mobility	0.773	0.031	24.322	0.000***	Accepted	0.711	0.830

Result is significant at 1%, 5% and 10% level of significance. Moreover, *** represents 1% level of significance

Table 8: Effect size f2

Hypothesis	Original sample	Sample mean	Standard deviation	T value	P-value
Micro credit -> WEDU_	0.740	0.756	0.171	4.335	0.000
Micro credit -> Women Empowerment	0.121	0.128	0.047	2.589	0.010
WEDU_ -> Women Empowerment	0.109	0.112	0.045	2.437	0.015
Women Empowerment -> Economic Security	0.798	0.846	0.154	5.185	0.000
Women Empowerment -> Financial Decisions_	1.757	1.780	0.280	6.274	0.000
Women Empowerment -> HED	1.742	1.763	0.284	6.130	0.000
Women Empowerment -> Legal awareness_	0.774	0.766	0.196	3.952	0.000
Women Empowerment -> Mobility	1.367	1.529	0.317	4.315	0.000

Table 9: Effect size Q²

Variables	SSO	SSE	Q ²
Economic security	1,152.000	847.557	0.264
Financial decisions_	1,536.000	1,058.154	0.311
HED	1,536.000	987.160	0.357
Legal awareness_	1,152.000	808.228	0.298
Micro credit	1,920.000	1,920.000	
Mobility	1,152.000	818.783	0.289
WEDU_	1,536.000	1,143.699	0.255
Women empowerment	6,528.000	5,758.992	0.118

the multifaceted impact of microfinance programs on women's empowerment. Microcredit initiatives not only provide women with financial resources but also enhance their agency and decision-making power within households, as highlighted (Al-Shami et al., 2018). The increased income resulting from microcredit facilitates investment in education for both women and their families (Al-Shami et al., 2021). Furthermore, the social capital and networks formed through participation in

microcredit groups contribute to the dissemination of information and resources related to education, aligning with the findings of (Cummings et al., 2019). Overall, these dynamics underscore the pivotal role of microcredit in promoting women's education through economic empowerment, increased agency, and social connectivity.

In our results micro credit has significant positive relationship with women empowerment. The observed significant positive relationship between microcredit and women's empowerment can be elucidated by the transformative effects of microfinance interventions on socio-economic dynamics (Mwalasha, 2021). Microcredit programs empower women by providing them with financial resources and entrepreneurial opportunities, leading to enhanced economic independence and decision-making power within households, as highlighted by (Panta and Thapa, 2018). Additionally, the group-based nature of many microcredit initiatives promotes social capital and collective empowerment,

as emphasized by (Uddin, 2014). These cumulative effects underscore the instrumental role of microcredit in fostering women's empowerment through economic autonomy, increased agency, and social structure.

In our results women education has positive and significant relationship with women empowerment. The perceived positive and significant relationship between women's education and empowerment in our study aligns with well-established findings in existing literature (Ashcraft et al., 2019). Education has long been recognized as a key determinant of women's empowerment, providing them with enhanced skills, knowledge, and confidence to participate in economic, social, and political spheres. Such studies as point out the transformative impact of education on women's agency and autonomy, stressing that education equips women with the tools to challenge traditional gender norms and contribute actively to decision-making processes (Morchain et al., 2015). Additionally, Sen's capability approach posits that education enhances women's substantive freedoms, enabling them to pursue a broader range of life choices and opportunities. As our study reaffirms the positive correlation between women's education and empowerment, it underscores the crucial role of education as a catalyst for women's advancement and societal transformation.

5. CONCLUSION AND RESEARCH IMPLICATIONS

In conclusion, our study establishes a significant and positive relationship between microcredit and women's empowerment, highlighting the pivotal role of microfinance programs in fostering economic autonomy, enhanced decision-making and social agency among women. While these findings underscore the potential of microcredit to contribute to broader gender equality goals, it is essential to acknowledge the study's limitations, including its cross-sectional nature and the need for cautious generalization to diverse contexts. Nevertheless, the implications for policy and practice are substantial, emphasizing the importance of sustained support for microcredit initiatives with an integrated approach that combines financial inclusion with capacity-building measures. As we navigate the complexities of empowering women through microfinance, further research is necessary to explore causal mechanisms, consider potential unintended consequences, and delve into the nuanced impact on different subgroups, ensuring that future interventions are tailored, inclusive, and effective in promoting sustainable women's empowerment.

The implications of the study indicate a significant positive relationship between microcredit and women's empowerment are versatile and carry important ramifications for policy, practice, and future research. Firstly, policymakers and development authorities should recognize the potential of microcredit programs as effective tools for promoting women's empowerment, not only economically but also socially and personally. This emphasizes the need for continued support and expansion of microfinance initiatives to empower women in diverse contexts. Additionally, the study suggests the importance of incorporating training and capacity-building components within microcredit programs to

maximize their impact on women's empowerment. Furthermore, financial institutions and organizations should consider tailoring their microcredit offerings to address specific needs and challenges faced by women entrepreneurs. From a research perspective, this study underscores the necessity for further investigation into the nuanced mechanisms through which microcredit contributes to women's empowerment, allowing for the refinement of programmatic interventions and the development of more targeted policies. Overall, the findings of this study call for a holistic approach that combines financial inclusion with capacity-building and addresses broader socio-cultural factors influencing women's empowerment.

While our study identified a significant positive relationship between microcredit and women's empowerment, it is important to acknowledge certain limitations that may influence the interpretation of our findings. Firstly, the study's cross-sectional design limits our ability to establish causality, and longitudinal studies would provide a more comprehensive understanding of the dynamic relationship over time. Additionally, the study focused on a specific geographic area or demographic, and the generalizability of the findings to other contexts should be approached with caution. The reliance on self-reported data may introduce response bias, and future research could benefit from incorporating more objective measures of women's empowerment. Moreover, the study did not delve into the potential negative consequences or unintended outcomes of microcredit, such as over-indebtedness, which warrants further investigation.

Building on the insights gained from this study, future research endeavors could explore the nuanced pathways through which microcredit influences various dimensions of women's empowerment. Longitudinal studies could help establish causal relationships and better capture the dynamic nature of this phenomenon. Research that considers contextual factors, such as cultural and institutional differences, would enhance the generalizability and applicability of findings across diverse settings. Moreover, investigating the impact of different microcredit models and delivery mechanisms on women's empowerment could provide valuable insights for program optimization. Future studies should also assess the long-term sustainability of empowerment outcomes and potential spillover effects on other aspects of women's lives. Finally, exploring the intersectionality of women's identities, such as age, socio-economic status, and educational background, in the context of microcredit and empowerment would contribute to a more nuanced understanding of the differential impacts across diverse groups.

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