Measuring Dimensions of Women Empowerment in North-West Region of Bangladesh: A Case Study

Bilkish Banu & Dr. Sadika Haque

Abstract

The current study was aimed to measure the different dimensions of women empowerment and identify the factors affecting women empowerment in the North-West Bangladesh. To conduct the study, 537 female respondents who had at least one biological child aged between 6 to 59 months were selected purposively from eight districts of North-West region of Bangladesh using stratified random sampling technique. To identify the factors which influence different dimensions of women empowerment, binomial logistic regression model was used. Descriptive result showed that the overall women empowerment are 13%, where the dimension wise empowerment are (self-esteem – 36%, access to and control over resources – 24%, attitude and behaviour of husband – 48%, decisions related to household – 19%, and mobility– 12%). The factors which significantly influence different dimensions of women empowerment were exposure to media, attitude and behaviour of husband, mother's employment, spousal age difference, mother's education, wealth index, family religion, public speaking power, participation in community events, household size and ownership in tangible resources. The result showed that education plays a significant role to improve the level of empowerment of female respondents of NW Bangladesh. When level of education of mothers increased, the self-esteem and access to and control over resources also improved. The study concluded that as the level of empowerment of women living in the NW region are comparatively low in the context of Bangladesh, therefore to increase their empowerment, the study recommended for underlining on quality education for the respondents especially urban and peri-urban areas to move out from poverty.
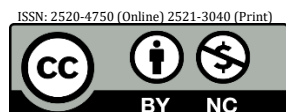
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1. Introduction

In the modern era, women are almost half of the total population in the world, and they are trying to make remarkable changes through empowerment. Women's status in Bangladesh is determined by their education, economic independence, health, and fertility. However, structural disparities like gender discrimination in attaining education, share in the labor market and share in parental property remain. Women's labor force participation in Bangladesh is not adequate, with only 36.3% for women in 2019 compared to 81.4% for men (Kotikula et al., 2019). Additionally, women's contribution to the financial system is far not up to what it might be, as a result of their low participation within the labor market. Despite making up half of the population, women still experience exclusion and disadvantages, as shown by gender differences in a variety of health indicators. To ensure inclusive growth, it is important to own a greater level of engagement of girls in mainstream economic activities, and financial empowerment of girls can pave the way towards a discount in poverty. Women's empowerment is the way to empower women through education, awareness, literacy, and training. Bangladesh has made significant gains in the empowerment of women since independence, with maternal deaths and fertility reduced, gender equality achieved, gender quotas established, and legislation on violence against women enacted. However, the Bangladeshi society is patriarchal, patrilineal, and patrilocal, with a household and kindergarten structure that pools resources and controls men's work, sexuality, and mobility outside the household. Women's role in society has traditionally been limited to the private sector, but this has been challenged as women have become increasingly involved in the labor market and political, political, and cultural spaces. The Bangladesh Constitution ensures equal public participation and rights for women, but women's rights to marriage, divorce, custody, and heritage are governed by personal religious laws. Women's health, education, and economic participation have improved significantly, with a fertility rate of 2.3 and gender equality achieved in primary and secondary education by the end of the 1990s. However, women's participation in the labor force is still low and their vulnerabilities in the absence of formal contracts, safety at work, and access to social security are high. Women's participation in the labor force has increased over time, but the burden of domestic chores remains on their shoulders. Bangladesh has made progress in closing the gender gap in the last couple of years, with more than half of the population being women and their economic contribution increasing significantly. However, 82 percent of married women are victims of gender-based violence, and widespread sexual violence prevents women from achieving their full potential. To achieve the goals of women's development initiated by the Bangladesh government, the country has approved the highest budget allocation in history in the 2018-19 fiscal year. Women's empowerment is an essential factor in transforming the country from a low-income to a middle-income country. The reason why, in the majority of provinces in Bangladesh, women statues are transferring to engage in several works, especially women in the north-west region (Rajshahi, Rangpur) are dramatically changing their places for led betterment of daily life, for this reason, this study explores women empowerment and measuring dimensions by descriptive analysis.

2. Literature Review

The review of literature in any research is indispensable as it provides a new dimension for reviewing the stock of literary knowledge and information relevant to the proposed research. This knowledge gives a guideline in furnishing the future research problem through validating the existing findings. A study conducted on women's mobility and the situational conditions of

rape: showed that outdoors was not always riskier for women when compared with indoor public settings. Some outdoor environments were really protective, such as streets. Being in a risky social context and engaging in a risky activity was related with an increased risk of rape. Among those women who never drank alcohol, the results were similar to what was observed in the overall sample, which suggested that risky social interaction and risky activity made independent contributions to the risk of rape. The article finished with suggestions for rape prevention (Ceccato et al. 2020). Sraboni et al. (2019) carried out a research based on measuring autonomy evidence from Bangladesh. The purpose of this study was to study in detail the Relative Autonomy Index (RAI) for individuals, using data representative of Bangladeshi rural areas. An exploratory analysis of the determinants of autonomy of men and women in Bangladesh showed age, education, and income as suitable proxies for autonomy. Studies have highlighted the significance of measuring women's empowerment in Bangladesh's North-West region to address the specific challenges faced by women in this area. Limited access to education, healthcare, and economic opportunities perpetuate gender inequality and hinder women's empowerment (Kabeer, 2005). Women's empowerment is crucial for sustainable development and poverty reduction in Bangladesh, and measuring it helps track progress and identify gaps (UN, 2015). Various methods have been employed to gauge women's empowerment in the region. Surveys and indexes have been widely used to assess different dimensions of empowerment. The Women's Empowerment in Agriculture Index (WEAI) developed by Malhotra et al. (2013) is one such tool used to measure agricultural empowerment. This index captures various aspects such as access to resources, decision-making power, and control over income related to agriculture. These measurement strategies provide valuable insights into the progress and disparities in women's empowerment (Malhotra et al., 2002). Qualitative methods, including interviews and focus group discussions, have been utilized to complement quantitative research and capture the complex narratives of women in the North-West region (Kabeer, 1999). These qualitative approaches shed light on contextual factors that influence women's empowerment, including cultural norms, social networks, and community dynamics. They help in understanding the unique challenges and opportunities faced by women in the region (Kabeer, 2005). Economic empowerment plays a vital role in women's empowerment. It encompasses income-generating activities, employment prospects, and control over resources. Research has emphasized the importance of women's participation in the labor market, access to credit, and ownership of productive assets as key indicators of economic empowerment in the North-West region (Malhotra et al., 2002). Additionally, social empowerment, which includes women's rights, decision-making, and access to social services, is another crucial dimension (Narayan, 2005). Measuring women's participation in community organizations, healthcare utilization, educational opportunities, and decision-making processes helps assess social empowerment in the North-West region. To further progress this field, it is necessary both to investigate qualitatively what appear to be cultural influences on women's external motivation in Bangladesh and to implement the RAI in additional geographic and cultural settings to explore its validity and reliability in those settings. Oyediran (2016)found that a significant change over time in the percentage of Nigerian women supporting or accepting the notion that a man is justified in beating or hitting his wife was associated with education, place of residence, wealth index, ethnic affiliation, religious affiliation, women's autonomy in household decision-making, and frequency of listening to the radio. In Nepal, 26.3% of ever-married women experienced any form of IPV at some point in their lives, while only 13.7% has experienced any form in the past year. (Nayak and Mohanta 2008) found that the approval of unequal gender norms by women

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still exists, with more than half of the respondent believing wife beating to be justified for one reason or the other. (Khan, 1999) found that unmarried girls were most restricted in all types of mobility, even within their own villages. IPPV was more likely to be reported by women whose husbands or partners accused them of unfaithfulness, did not permit them to meet female friends, insisted on knowing their whereabouts and sometimes or often got drunk Kw et al. (2013). Ethnicity plays a vital role in determining wife's decision-making authority, as does formal education, age, and work for pay outside the home (Kritz and Makinwa-Adebusoye 1999). A study in north Indian city examined the determinants of women's autonomy in three areas: control over finances, decision-making power, and freedom of movement. Results showed that women with closer ties to natal kin were more likely to have greater autonomy in each of these three areas Bloom et al.,(2001). Microfinance programmes are promoted as a key strategy for addressing women empowerment and poverty lessening in Ghana, and access to credit through microfinance organizations has a positive impact on social empowerment of women (Addai, 2017). In Gambia, individuals' ability to induce changes in communal life is causally related to education, origin, age, gender and marital status, economic activity, and health. This analysis is a pioneer work that gives new insights into empowerment of various socio-demographic groups in a developing country setting. Trommlerová et al. (2015). This study revealed that majority of married women in Bangladesh can jointly make decision about their household and economic segment, health care, and the participation in political and social activities with their husbands. Urban respondents were relatively more empowered than rural counterparts and types of places of residence plays a significant role in the women empowerment. Gender violence was found to be a major issue, with 24% of currently married Bangladeshi women experiencing both physical and/or sexual IPV in the past year. Current employment status predicted intimate partner violence, and household decision-making pattern also emerged as a predictor of IPV. Feminization of labor force in Bangladesh is unambiguous, with women entering the labor force at a far faster pace than before and feminine labor growth is quicker than male labor growth. Women participation in labor market increase women involvement in household supplementary income and is highest in-service sector. Mahmud (2003) and Jamal (2017) found that empowerment dimensions associated with spousal physical violence are mobility, land ownership, house ownership and employment, while wife educational attainment and reading newspaper habit are statistically insignificant. Heckert et al. and Galièa et al. (2019) analyzed the four domains of women's empowerment-purchasing decisions, healthcare decisions, family planning decisions, and spousal communication. They used a Structural Equation Model (SEM) to measure the relationship between women's empowerment, household food security, and maternal and child diet diversity. Results showed that women's participation in decision making process was negatively associated with family size, but positively associated with respondent's age, education, farm size, income and occupation Roy et al. (2017). In addition, income generating activities supported by Rural Employment Creation Project (RWECP) had a positive impact, but the extent of changes was not significantly high. Marital status and ethnic affiliation were also influential factors in women empowerment. (Parvin, Ahsan, and Chowdhury 2005).

3. Materials and Methods

This research conducted a quantitative approach based on philosophical examination through exploratory factor analysis and statistical tests, it assisted to gain better knowledge and understanding of social phenomena. The researcher used the quantitative approach to measure the situations and reach to the objective through statistics analysis (Haig and Haig,

2018). Which is more logical and rational to finding any result of studies. Researcher selected eight districts of the North-West region of Bangladesh (Naogaon, Dinajpur, Gaibandha, Panchagarh, Rajshahi, Rangpur, Sirajganj, Bogura) to conduct this study Wahed et al., (2014). Those districts are mainly situated in Rangpur and Rajshahi provinces which are surrounded by many big rivers (Padma, Teesta, Dharla, Brahmaputra) most of the regions are climate-affected areas, and those are so far from capital city of Dhaka. The majority of people are underprivileged and trying to positively change their lifestyle by searching for stable jobs in different cities and involving earning sources. A few women of the north-west area took responsibility for their families by establishing small businesses in the local area through NGO financial support. Some of them are rigorously supported families, friends, neighbors and relatives. So the women of the North-West parts, who are eagerly determined to empower and contribute countries economy by their income generate activities.
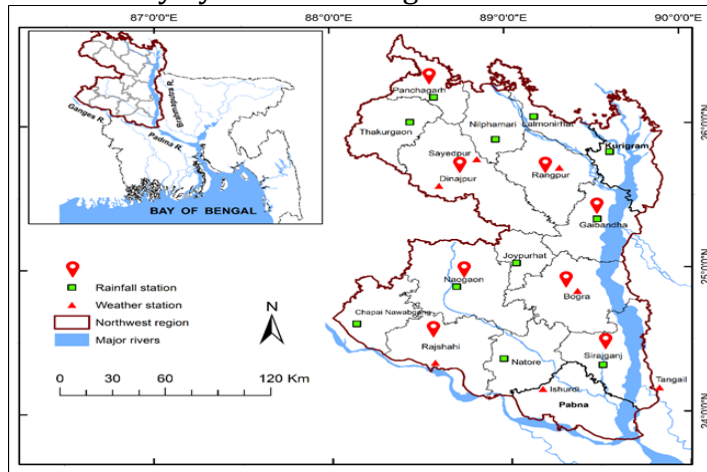

Figure 1 North-West region of Bangladesh map- The research area.
Source: Karim et al., (2020)

Researchers gathered data from 537 respondents in the study area by using a field survey, data collection from teachers, govt. and private services, businessmen, and day laborers, who are biologically women and stay in the north-west part of Bangladesh. A sample of persons was chosen for this research in order to gather information and practical experience about women empowerment. Researchers should examine the participants' experiences to ensure that they match up with the study goals Seddiky et al., (2022). The sample size should be as large as possible to allow for adequate degrees of freedom in the statistical analysis a reasonable size of the sample to achieve the objectives of the study was taken into account. A stratified random sampling technique was used to obtain the sample size, which is as follows:

Table 1 Distribution of sample

Division	District	Selected sample	Percentage of the total sample
Rajshahi	Naogaon	43	9%
	Rajshahi	89	17%
	Sirajganj	74	14%
	Bogura	85	16%
Rangpur	Rangpur	72	13%
	Dinajpur	59	11%
	Gaibandha	60	11%
	Panchagarh	55	10%
Total		537	100%

The interviews were conducted one by one and face-to-face with the respondents. This research used tools and equipment like questionnaire that maintained some criteria while collecting data which are as follows- household characteristics and socio-economic status-related variables, Child and mothers' anthropometry-related variables, Indicators of women's empowerment, Mothers' employment-related variables, child care related variables, mothers' nutrition knowledge and IYCF-related variables Household hygiene and sanitation practice-related variables. Field data for this study were collected from relevant respondents in north-west parts of Bangladesh between 05 March and 20 June 2020. This study reviewed relevant books, journal articles, conference papers, and book chapters from Google scholar, Research gate, Scopus, and web of science, to make a strong literature review regarding Women empowerment, Women empowerment in Bangladesh, Factors of empowerment, empowerment, and women, are principal term for seeking existing literature of the study, and APA 6th reference approach has been followed this bibliographic section.

3.1 Analytical techniques
Data cleaning was started immediately after completing the data collection process. Most of the mistakes were made due to typing mistakes, information gaps, and incorrect formatting. All the data was corrected one by one and stored in a separate EXCEL file and password-protected computer. This ensures the data's strong security. All data was analyzed carefully to achieve the objectives of the study. Descriptive statistic was used to analyze the socioeconomic characteristics of respondents. Different types of regression models were used to determine the relationship between women's empowerment and child nutritional status and identify factors that are affecting women's empowerment.

3.2 Variable specification and preparation
This study mainly consisting of two variable instance- Firstly, Women Empowerment Index, which used five domains to measure women's empowerment at the individual level. Indicators were classified as self-esteem, access to and control over resources, attitude and behavior of partner/husband, decisions related to household, and information about mobility. All the factors were quantifiable and equal weight was attached to each indicator. The study used 1 for empowerment and 0 for disempowerment, and the aggregate empowerment score should lie between 0 to 1 scales. The cut-off is 0.80 (80%) to measure adequate empowerment, following the WEAI method (Roy et al., 2019). Secondly Individual Empowerment Index that have several questions regarding women's empowerment in this questionnaire. Cronbach's Alpha, Bartlett's test of sphericity, KMO Measure of Sampling Adequacy, factor var list, varimax rotation, predict command, 80% cut-off used by OPHI, and women empowerment binary outcome variables. This study used the 80th percentile value as our cut-off value and those who achieve more than or equal to this value are considered empowered or otherwise disempowered.

Table 2 Dimensions of women's empowerment and Percentage of empowered women

Dimensions of women empowerment	Percentage of empowered women
Self -esteem	36
Access to and control over resources	24
Attitude and behavior of husband	48
Decisions related to household	19
Mobility	12

To identify the probability of women's empowerment based on a binary categorization of its different dimensions, a binary logistic regression model was utilized. The model's equation includes variables for the self-esteem dimension, access to and control over resources, the attitude and behavior of the husband, decision-making related to the household, and mobility dimensions. The equation can be expressed as

$$\text{Ln} \left(\frac{P}{1-P} \right) = \beta_0 + \beta_1 W_i + \beta_2 H_i + \beta_3 S_i + \varepsilon$$

Here, P represents the probability of the dependent variable where Y= 1. On the other hand, the equation, $\beta_1 \ldots \ldots \beta_k$ is the coefficient of the independent variables respectively, β_0 depicts the constant term, and ε denotes the error term of the model. In the current study, W is the vector of different maternal factors, including exposure to media, access to and control over resources, employment, and education. H represents the set of household variables such as wealth index, and S represents the spousal age difference and husbands' attitude, and behavior with the wife or respondent mother.

4. Results and Discussion

This study found from (Table 3) that mothers having at least one biological child were surveyed, and their socio-demographic characteristics were recorded. The average age of the respondents was 28 years and most of them were found to belong to the 25 to 34 age group.

Table 3 Socio-demographic characteristics of the respondents

Characteristics	Frequency	Percentage
Age		
Less than 15 years	1	0.19
15 to 19	18	3.35
20 to 24	114	21.23
25 to 29	173	32.22
30 to 34	162	30.17
35 to 39	59	10.99
40 to above	9	1.86
Education		
No institutional education	32	6
Upton secondary	258	48
Secondary to higher secondary	86	16
Higher education	161	30
Occupations		
Working outside		
Teacher	47	37.01
Govt. And private service	57	44.88
Day laborer	23	18.11
Self-employed		
Self-employed Business	74	73.27
Day laborer	27	27.73
Employment Status		
Not Employed	309	57.54
Employed	228	42.46
Religious Status		
Muslim	493	91.81
Hindu	44	8.19
Living Area		
Slum	69	12.85
Middle class	438	841.57
Upper class	30	5.59

Half of the respondents had education up to the secondary level, followed by higher education and secondary to higher secondary education level. 58% of the respondents were housewives

and the rest were working outside or employed mothers. Occupational status was classified based on 2 categories: working outside, and self-employed. 37.01% of respondents from working outside were teachers, 44.88% were involved in government and private services, 18.11% were day laborers, and 27% were households. The research evaluates dimension-specific empowerment as well as empowerment across all dimensions. (Table 4) indicates that 36%, 24%, 48%, 19%, and 12% of respondents' mothers felt empowered in their self-esteem, access to and control over resources, husband's attitude and conduct, household decision-making, and mobility dimensions, respectively. Across all criteria, the survey found that just 13% of respondents felt empowered.

Table 4 Empowerment status of the respondents

Women empowerment	Yes	No	Total
Self esteem	195 (36.31)	342 (63.69)	537 (100)
Access to control over resources	128 (23.84)	409 (76.16)	537 (100)
Attitude behavior of husband	258 (48.04)	279 (51.96)	537 (100)
Decision related to household	102 (18.99)	435 (81.01)	537 (100)
Information about mobility	65 (12.1)	472 (87.9)	537 (100)
Women empowerment (overall)	68 (12.66)	469 (87.34)	537 (100)

4.1 Factors Affecting Different Dimensions of Women Empowerment
An empowered woman is one who is definitely a self-confident person, rationally analyzes her surroundings, and exercises control over all decisions that positively influence her life. Again, an empowered woman recognizes the importance of balancing household and outside responsibilities, prioritizing her physical and mental health, and seeking support to participate in community life. This study measures women's empowerment across different dimensions. Each dimension is assessed separately, providing a comprehensive view of how women are empowered in various areas. The dimensions include self-esteem, access to resources, partner/husband behavior, household decision-making, and mobility information. The study quantifies factors under each domain to measure individual empowerment and identify areas for policy prioritization. The study used binomial logistic regression to identify factors influencing women's empowerment in northwest Bangladesh. STATA was used for modeling, and the best-fitting model was chosen based on the lowest AIC value. The following table shows the estimated odds ratio, significance level, and standard error.

4.1.1 Factors affecting self-esteem.
Self-esteem refers to a person's beliefs about their own worth and value. It also has to do with the feelings people experience that follow from their sense of worthiness or unworthiness. We might also think of this as self-confidence. Self-esteem is important because it heavily influences people's choices and decisions. Literature shows that individuals who feel self-confident, and are thus "psychologically empowered," are more likely to make progress toward their personal goals and are more likely to be happy (Pradhan, Bina, 2003). This might be because those with high self-confidence have a feeling of empowerment-they believe they have efficacy regarding their essential pursuits, and therefore are optimistic that they can make progress toward a wide variety of goals. But, Afulani et al. (2017) said that in some cases, low

self-esteem was symptomatic of the position of women in society, and it was more evident among excluded groups, such as indigenous women, than among professional women. Binomial logistic regression was used to investigate factors influencing mothers' empowerment in terms of self-esteem. Exposure to media, husband's attitude, mothers' employment, education, spousal age difference and wealth index were found to significantly influence empowerment. Results showed that mothers exposed to media were 1.7 times more likely to have self-esteem. Similarly, mothers receiving positive attitudes from their husbands were 0.3 times more likely to be empowered. Employed mothers were 1.27 times more likely to be empowered, while spousal age difference negatively affected empowerment. Education also played a crucial role, with each year of schooling increasing the probability of empowerment by 0.17 times. Household wealth is significantly associated with self-esteem.

Table 5 Binomial logistic regression for self-esteem

Self-esteem	OR (ST. Err)	OR (St. Err)	**OR (ST. Err)**	OR (ST. Err)	OR (ST. Err)	OR (ST. Err)
Exposure to media [ref = no]	1.78* (0.299)	1.99** (0.286)	**1.7* (0.299)**	1.52 (0.44)	1.71* (0.48)	1.93** (0.54)
Own tangible resources [ref = no]	1.59** (0.236)	1.66** (0.229)		1.92*** (0.45)	2.02*** (0.46)	
Husband's reaction to unwilling mistake [ref = good]	0.3*** (0.261)	0.29*** (0.256)	**0.32*** (0.262)**	1.63*** (0.20)	1.67*** (0.21)	1.62*** (0.20)
Mothers employment [ref = not employed]	1.93*** (0.22)	2.06*** (0.219)	**2.27*** (0.229)**	1.94*** (0.43)	2.09*** (0.45)	2.11*** (0.46)
Spousal age difference	0.96*** (0.02)	0.96*** (0.012)	**0.95*** (0.012)**	0.96*** (0.01)	0.96*** (0.01)	0.96*** (0.014)
Mothers education [ref = no education]		1.16*** (0.035)	**1.17*** (0.039)**		1.16*** (0.04)	1.21*** (0.04)
Up to secondary	0.76 (0.489)			0.75 (0.37)		
Secondary to higher secondary	2.3 (0.532)			2.09 (1.12)		
Higher education	3.18** (0.535)			3.16** (1.70)		
Wealth index						0.96 (0.07)
Second			**0.43** (0.404)**			
Middle			**0.28*** (0.434)**			
Third			**0.59 (0.433)**			
Fourth			**0.89 (0.442)**			
Constant	0.65 (0.517)	0.198*** (0.446)	**0.29*** (0.466)**	0.23*** (0.10)	0.06*** (0.02)	0.06*** (0.02)
Pseudo r-squared	0.239	0.229	**0.254**	0.232	0.222	0.208
Prob > chi2	0.000	0.000	**0.000**	0.000	0.000	0.000
Akaike Information Criteria (AIC)	553.511	556.216	**546.746**	558.11	561.32	570.73

*** 1%, ** 5%, * 10% level of significance

4.1.2 Factors affecting access to and control over resources.

Lack of resources can make a person feel destitute, unable to compare themselves with those higher up in society. Mothers with control over resources like property and land can spend it on their and their baby's needs, increasing their confidence. Education and employment are

important factors in a mother's empowerment. A 1-year increase in education makes a mother 1.28 times more likely to be empowered, and employed mothers are over 3 times more likely to be empowered, both statistically significant (Table 6). Our research found that increasing age significantly disempowers mothers, with a 1-year increase resulting in a 1.1 times higher likelihood of disempowerment. Religion also plays a role, with Hindu mothers being 0.26 times more likely to be disempowered than Muslim mothers. Additionally, mothers who reported their husband's bad reaction to mistakes were 0.31 times more likely to be disempowered. All the results are statistically significant at different levels (Table 6).

Table 6 Binomial logistic regression for access to and control over resources

Access to and control over resources	OR (SE)	OR (SE)	OR (SE)	OR (SE)	OR (SE)
Household head education				2.19*** (0.50)	2.15*** (0.49)
Respondent education	1.287*** (0.051)	1.308*** (0.054)	1.2*** (0.05)	1.16*** (0.056)	1.15*** (0.05)
Mothers employment [ref = not employed]	3.072*** (0.766)	3.201*** (0.823)	3.04*** (0.73)	3.37*** (0.83)	3.46*** (0.86)
Respondent age	1.12*** (0.03)		1.13*** (0.02)	1.12*** (0.03)	1.13*** (0.03)
15 to 19		0.045** (0.059)			
20 to 24		0.011*** (0.01)			
25 to 29		0.046*** (0.04)			
30 to 34		0.066*** (0.056)			
35 to 39		0.068*** (0.061)			
40 to above		1* (0.096)			
Family religion [ref = Muslim]	0.258** (0.171)	0.306* (0.204)	0.19** (0.12)	0.2** (0.13)	0.18** (0.12)
Husband's reaction to unwilling mistake [ref = good]	0.305*** (0.079)	0.28*** (0.076)		1.21 (0.31)	
Constant	0.001*** (0.001)	0.474 (0.41)	0.0003*** (0.0003)	0.0006*** (0.0006)	0.0007*** (0.00007)
Pseudo r-squared	0.287	0.307	0.257	0.284	0.287
prob>chi2	0.000	0.000	0.000	0.000	0.000
Akaike Information Criteria (AIC)	432.592	426.890	450.03	432.2	434.3

*** 1%, ** 5%, * 10% level of significance

4.1.3 Factors affecting attitude and behavior of husband.

Attitude impacts behavior and positive attitudes can lead to well-adjusted behaviors, reduce stress, cope with challenges, achieve goals, and maintain wellness. Education plays a crucial role in shaping attitude, with increased years of schooling leading to increased empowerment for mothers and household wealth is positively associated with positive attitudes from husbands. The ability to speak publicly and participate in community events are also important factors for women's empowerment, with those who can speak publicly being 2.2 times more likely to be empowered and those who regularly participate in community events being 1.3 times more likely to be empowered.

Table 7 Binomial logistic regression for attitude and behavior of husband

Attitude and behavior of husband	OR (SE)	OR (SE)	OR (SE)	OR (SE)
Household head education	**1.007 (0.102)**	1.029 (0.103)	1.036 (0.104)	1.003 (0.102)
Respondents education [ref = no education]	**1.109*** (0.039)**			1.103*** (0.04)
Up to Secondary		1.131 (0.553)	1.13 (0.55)	
Secondary to higher secondary		1.665 (0.958)	1.721 (0.978)	
Higher education		3.004* (1.714)	3.156** (1.781)	
Respondent's age [ref = less than 15 years]	**0.974 (0.019)**		0.967* (0.019)	
15 to 19		2.746 (2.483)		2.235 (1.997)
20 to 24		2.283 (1.772)		1.868 (1.413)
25 to 29		2.35 (1.786)		2.092 (1.559)
30 to 34		1.85 (1.411)		1.68 (1.256)
35 to 39		1.884 (1.507)		1.605 (1.251)
Wealth index score [ref = lowest]	**1.265*** (0.097)**			1.258*** (0.097)
Second		1.315 (0.476)	1.305 (0.471)	
Middle		2.265** (0.858)	2.291** (0.865)	
Fourth		2.776*** (1.085)	2.804*** (1.094)	
Highest		3.001*** (1.219)	3.017*** (1.21)	
Can speak publicly [ref = no]	**2.157*** (0.47)**	1.979*** (0.443)	1.942*** (0.432)	2.196*** (0.481)
Participation in community events [ref = never]				
In some cases	**0.503*** (0.112)**	0.434*** (0.099)	0.442*** (0.1)	0.493*** (0.11)
Always	**1.3 (0.353)**	1.093 (0.302)	1.128 (0.312)	1.256 (0.341)
Constant	**0.446 (0.271)**	0.104*** (0.089)	0.542 (0.384)	0.124*** (0.097)
Pseudo r-squared	**0.148**	0.156	0.158	0.147
prob>chi2	**0.000**	0.000	0.000	0.000
Akaike Information Criteria (AIC)	**649.431**	659.9	651.795	656.975

*** 1%, ** 5%, * 10% level of significance

4.1.4 Factors affecting decisions related to household

Education is crucial for women's decision-making roles, leading to improved self-control, wealth control, autonomy, and power relations within the family. Autonomy in economic decision-making also enhances dignity, resource control, meets basic needs, and reduces economic dependence. Increased schooling and wealth index score lead to increased probability of empowerment, and higher socioeconomic status leads to greater likelihood of empowerment. However, household size can reduce decision-making probability. Public speaking ability and freedom of movement to community events are significant factors for empowerment, while an increase in the constant results in disempowerment.

Table 8 Binomial logistic regression for decisions related to household

Decisions related to household	OR (SE)	OR (SE)	**OR (SE)**	OR (SE)
Respondents education [ref = no education]	1.145** (0.062)		**1.145** (0.063)**	
Up to Secondary		4.495 (5.233)		2.99 (3.429)
Secondary to higher secondary		6.004 (7.242)		4.184 (4.982)
Higher education		6.614 (7.815)		5.198 (6.084)
Wealth index[ref = lowest]	1.383** (0.195)			1.479*** (0.208)
second		1.926 (1.478)	**1.837 (1.393)**	
middle		2.128 (1.593)	**1.624 (1.245)**	
third		4.128* (3.051)	**3.029 (2.291)**	
fourth		7.653*** (5.649)	**5.423** (4.092)**	
Household size	0.616*** (0.092)	0.597*** (0.091)	**0.607*** (0.092)**	0.603*** (0.091)
Spousal age difference	0.977 (0.017)	0.974 (0.018)	**0.975 (0.017)**	0.977 (0.018)
Can speak publicly [ref = no]	4.372*** (1.759)	4.939*** (2.006)	**4.109*** (1.665)**	5.045*** (2.034)
Participation in community events [ref = no]	6.694*** (2.358)	6.191*** (2.204)	**6.201*** (2.195)**	6.567*** (2.323)
Constant	0.031*** (0.028)	0.011*** (0.014)	**0.018*** (0.017)**	0.034** (0.045)
Pseudo r-squared	0.306	0.313	**0.318**	0.3
prob>chi2	0.000	0.000	**0.000**	0.000
Akaike Information Criteria (AIC)	376.247	382.655	**375.7**	383.3

*** 1%, ** 5%, * 10% level of significance

4.1.5 Factors affecting mobility

Free mobility is crucial for women's empowerment. Rural women have less mobility than urban ones, with only 38% able to go outside the community alone. Mother's age and education level are important factors, as increasing age by 1 year results in a 1.08 times greater likelihood of being empowered, while education up to secondary level makes a mother 0.08 times less likely to be disempowered. A mother owning property makes her 2.27 times more likely to be empowered, while women whose husbands get angry at unwilling mistakes are 0.29 times more likely to be disempowered. Public speaking independence makes women 3.89 times more likely to be empowered, while exposure to media makes them 2.41 times more likely to be empowered. (Nayak and Mahanta, 2009) have found that women's mobility is also influenced by their background characteristics such as age, education, marital status, family type, etc.

Table 9 Binomial logistic regression for mobility

Mobility	OR (SE)	OR (SE)	OR (SE)	OR (SE)	OR (SE)
Respondents education [ref = no education]		0.954 (-0.75)	0.964 (-0.57)		
Up to secondary	**0.08*** (0.782)**			0.081*** (-3.33)	0.088*** (-3.17)
Secondary to higher secondary	**0.05*** (0.951)**			0.052*** (-3.21)	0.048*** (-3.23)
Higher education	**0.08*** (0.925)**			0.098*** (-2.61)	0.108** (-2.48)
Own tangible resources [ref = no]	**2.27* (0.447)**	1.862 (1.51)	2.275** (2.04)	2.643** (2.22)	3.896*** (3.15)
Husband's reaction to unwilling mistake [ref = good]	**0.29*** (0.316)**	0.305*** (-3.86)	0.297*** (-3.98)	0.284*** (-4.02)	
Can speak publicly [ref = no]	**3.89*** (0.473)**	4.33*** (3.11)	4.277*** (3.11)	3.701*** (2.79)	2.997** (2.36)
Exposure to media [ref = no]	**2.41* (0.459)**	2.869*** (2.58)	2.705** (2.46)	2.092 (1.64)	1.798 (1.33)
Respondent age	**1.08** (0.032)**	1.097*** (3)			
Spousal age difference			0.98 (-1.25)	0.99 (-0.65)	0.994 (-0.41)
Household head education	**1.21 (0.211)**	0.949 (-0.28)	0.917 (-0.46)	1.188 (0.82)	1.161 (0.71)
Constant	**0.078*** (0.139)**	0.005*** (-4.8)	0.083*** (-3.92)	0.255** (-2.03)	0.098*** (-3.79)
Pseudo r-squared	**0.231**	0.2038	0.184	0.217	0.185
Akaike Information Criteria (AIC)	**324.614**	331.54	339.215	330.43	343.08

*** 1%, ** 5%, * 10% level of significance

5. Conclusion and policy implementation

Women empowerment is the process of equal rights, opportunities, and access to women's resources. To make an independent environment for decision-making, practice opinion and activity engaging in social, economic, political, religious, and other cultural activities in various spheres of daily life. Women empowerment mainly emphasis to positive change the gender role every step of life. This paper addresses that Women's empowerment includes independence, equality, and freedom of expression. A binomial logistic regression model was used to determine the factors influencing the empowerment of women. Overall, descriptive findings revealed an empowerment rate of 13%. Self-esteem, resource control, husband's attitude, domestic decisions, and freedom of movement had respective empowerment rates of 36%, 24%, 48%, 19%, and 12%. Media exposure, husband's behavior, employment, the age difference between spouses, maternal education, affluence, religion, public speaking ability, community participation, household size, and resource ownership were significant factors. Education is the most significant tool for women's empowerment and overall Northwest Bangladesh progress. Educated women are self-confident, have financial stability, decision-making power, and can raise their voice against domestic violence and harassment. Women are important in every field and are considered the backbone of a family. Urban areas have working women, but rural areas still restrict them to household chores. Empower a woman through education and be part of the change. On the other hand, Wealth index positively associated with self-esteem, attitude and behavior of husband, household decisions, and mobility. Based on the findings, the research suggests some policy recommendations to formulate policy at national levels are as follows- Firstly, Access to education- To empower women, governments should ensure that girls in the region have access to quality education. Building more schools, giving poor girls scholarships, and recruiting more female teachers are examples. Secondly,

promoting women employment- Policy should encourage women to work, especially in non-traditional sectors. This might involve vocational training, developing female-friendly career options, and rewarding firms who recruit more women. Thirdly, improving healthcare facilities- Policies should be adopted to help women in the region get basic healthcare. These might involve creating additional clinics, educating more female healthcare personnel, and subsidising healthcare. Fourthly, reducing gender-based violence- Gender-based violence is a significant concern in the region, and legislation should be enacted to combat it. This may involve strengthening laws against violence, offering assistance and protection for survivors, and supporting awareness campaigns to alter attitudes and behaviors. Finally, ensure women participation in decision-making- Women are frequently excluded from decision-making processes in the region, and strategies to improve their involvement must be enacted. This might involve establishing quotas for women in elected posts, offering leadership and advocacy training, and ensuring that women have access to the necessary knowledge and tools to participate in decision-making.

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