

Microfinance, Health Seeking Behaviour and Health Service of Rural Households: Evidence from a Cross-sectional study in Bangladesh

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Abstract

This paper attempts to examine whether participation in microfinance program improves health seeking behaviour and health knowledge of the participants. The study is based on the primary data of 439 households across 20 villages of four different districts in Bangladesh. The data were collected on a field survey. Our results suggest that the overall impact of microfinance operations on the health services and health seeking behaviour of the participants is mostly positive. Microfinance participants' health related issues as indicated by antenatal care, maternal care, family planning, diarrhoea remedial, immunization provided, malaria/TB treatment, and medicines accessibility improved significantly after joining the microfinance. Further research should aim to figure out whether there is any substantial difference in the health seeking behaviour of the members (treatment) and non-members (control) of microfinance institutions (MFIs).

Keywords: Microfinance, health seeking behaviour, health service, Bangladesh.

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1. Introduction

As per the constitutional commitment of the Government of Bangladesh to provide medical facilities to all citizens, the government has been developing health infrastructure as well as strengthening the health and family planning services with special attention to the rural people (Hamid, Roberts & Mosley 2011) . Despite the infrastructure for healthcare delivery, the government has failed to fulfill the desired healthcare needs of the rural people due to various reasons. Firstly, doctors are reluctant to stay at *upazilla* (sub-district) health complex; secondly, there is lack of input and skill mix due to recruitment problems; and finally, improper behavior of the service providers to the rural people (BBS, 2010). In this regard, there are few microfinance institutions that have come forward to provide healthcare services in addition to disbursing credit to the participants. Now this is the crying need from the end of the rural people to support them by providing healthcare services associated with the credit disbursement by the microfinance institutions (MFIs). Now the question is why microfinance institutions would expand their services to include health. There are two basic reasons: health services are a natural extension of their mission of financial security and social protection of the client, and healthier clients better serve the microfinance institutions' goals of growth and long-term viability (Leatherman & Dunford 2010).

Providing quality health care service is a challenge to policy makers especially in developing countries. The poor in developing countries experience poor sanitation conditions, undesirable shelter, water quality and lack of contraceptive facilities, which makes them more vulnerable to poor health. Therefore, the Millennium Development Goals rightly include the target of reducing the population without sustainable access to drinking water and basic sanitation by 50 percent by 2015 (World Health Organization, 2005). Particularly, the poor in Bangladesh are underprivileged in accessing quality health

care due to lack of health seeking behavior ²and health services in the country. Therefore, services relating to health seeking behavior is needed to make the existing health-care delivery system more pro-poor effective.

A small number of papers investigated the impacts of microfinance on child health and women health in Indonesia, Latin America, Africa (Collier et al. 2014; DeLoach & Lamanna 2011; Geissler & Leatherman 2015). However, whether and to what extent microfinance activities improve health seeking behaviours and health services in developing countries has got very little attention from researchers and policy makers. This study attempts to fill up this gap in the literature. Moreover, to the best of our knowledge, none of the previous studies used primary data to examine health effects of participation in microfinance. Therefore, this study will be an important addition to the literature too.

The remaining of the paper is structured as follows: section two presents a brief review of literature; section three describes the conceptual framework, research design, study area, sample selection, data sources and descriptive statistics; section four displays econometric specification; section five discusses results, and section six concludes the paper.

2. Brief Review of Literature

Microfinance is operational in Bangladesh and other parts of the world since late-1970s, but the impacts of microfinance on health seeking behaviour, access to health service and health input in particular have rarely been investigated in previous literature. Microfinance is expected to influence health seeking behaviour and health outcomes directly by the ability to pay for health-related services, or indirectly by improving people's economic status and hence increase health inputs (e.g., nutritious food and leisure time). In Bangladesh, only a few studies have focused on the impacts of microfinance on

² Health seeking behaviour is any activity undertaken by individuals who perceive themselves to have a health problem or to be ill, for the purpose of finding an appropriate remedy (Chrisman, 1977).

health seeking behaviour and access to health services of the participants of MFIs. Among those (Ahmed et al. 2000, 2003; Ahmed et al. 2006; Amin et al. 2001); Amin, Shah and Becker (2010) are notable. Some of these studies focused only on the microcredit participation considering socioeconomic differentials and health seeking behaviour and found mixed results (Ahmed et al. 2006; Ahmed et al. 2005; Amin, Shah & Becker 2010). A few studies only focused on family planning services, antenatal care and maternal care and confirmed improvement on those issues due to the participation of MFIs with exclusive health or social consciousness programs but not necessarily the intervention of microfinance activities in the community (Amin et al. 2001; Koenig et al. 2007; Norwood 2011; Quayyum et al. 2013; Rahman et al. 2008). Moreover, gender difference and age may also be sometime decisive factors behind the improvement of health seeking behaviour due to the intervention of microcredit program, which is evident from few studies (Ahmed et al. 2000; Ahmed et al. 2005). One of the key studies conducted by Ahmed et al. (2003) found that health needs of the poor need to be integrated with development interventions that improve socioeconomic status. On the other hand, some of the studies only discussed about the issues related to health seeking behaviour of the rural households (Ahmed 2001; Ahmed et al. 2005; Rahman et al. 2012). Among them, an exclusive study carried by Ahmed (2001) explored the morbidity prevalence, illness profiles and health seeking behaviour of different ethnic groups of Chittagong hill tracks in Bangladesh and found difference among the ethnic groups.

Despite the limited studies on microcredit and health seeking behaviour in particular, however, there is a considerable number of studies on other aspects of health related issues and microfinance participation. The available evidence from the existing studies (Hadi 2001; Strobach & Zaumseil 2007) suggested that microfinance generally has a positive impact on promoting health knowledge among the participants. There exists a

positive relationship between the duration of membership of microfinance and health knowledge. Similar studies in Bangladesh also showed high magnitude of association between microcredit participation and health outcomes (Amin, Shah & Becker 2010; Leatherman & Dunford 2010). These studies found that microfinance could improve the health outcomes of the participants by providing them with proper health knowledge, and informing the participants about available health services and how to access those services. Leatherman and Dunford (2010) also found that MFIs was associated with improvement in the treatment of diarrheal diseases in the Dominican Republic. MckNelly and Dunford (1999) found that microfinance is related with better maternal health and nutrition practices in Bolivia and Ghana. Some of the studies carried out in African countries revealed that microfinance was positively associated with preventing HIV/AIDS along with reducing the risk of physical or sexual abuse (Barnes, Gaile & Kimbombo 2001; Pronyk et al. 2006). In a qualitative study, conducted in Burkina Faso by Hennink and McFarland (2013) showed that microfinance enhances the health behaviour and health expenditure choices of women. In Ghana, De La Cruz et al. (2009) found that microfinance institutions can effectively contribute to community and national malaria initiatives by increasing knowledge, leading to increased insecticide-treated bed net ownership and use by vulnerable members of the household (particularly pregnant women). Littlefield, Morduch and Hashemi (2003) also provided specific evidence for the impact of microfinance on health and concluded: “households of microfinance clients appear to have better nutrition, health practices and health outcomes than comparable non-client households” (p.4). The study conducted by Hamid, Roberts and Mosley (2011) investigated on Grameen Bank (GB), the largest MFI in Bangladesh, whether adding micro health insurance (MHI) to microcredit schemes can contribute to improving health awareness, health-seeking behaviour, and health status. Their results were statistically

significant to show a positive relationship between MHI placement and all of the health outcome measures. Another study was conducted based on quasi-experimental survey in Ecuador and Honduras and found interesting result. In both countries, health bank participation significantly raised subsequent healthcare over credit-only participation, and at least reduced the tendency to switch from breast-feeding to bottle-feeding as income rises (Smith 2002).

Rather than focusing on the effects of specific health schemes incorporated into microfinance programs, some literature emphasize more on the indirect impact of microcredit on health. For example, according to Butcher (2010), even without an additional health component, microfinance resulted in health improvements for its clients due to their enhanced economic status. Increased economic status allowed poor people to have better access to nutritious food, to have better sanitation infrastructure installed at their homes, and to have medical care when they are sick. However, Butcher (2010) also admitted that the relationship between microfinance participation and health is not likely to be as direct and simple as expected.

Furthermore, some of the studies showed their doubt on the conclusion that microfinance can improve the health outcomes of its clients either directly or indirectly. For example, Dohn et al. (2004) failed to show that participants in a microcredit program experienced any significant improvement for the eleven health indicators that they identify. Similarly, Mohindra, Haddad and Narayana (2008) found no relationship between participation in microfinance program and self-assessed health or management of health risk in Kerala, India. The microcredit program in Hyderabad, India also failed to show that the treatment group has better health outcomes than the control group (Banerjee et al. 2013).

Overall, previous literature focused on health knowledge or awareness and health improvement and outcomes rather than examining health seeking behaviour and access to health service and health input in particular. Most of the previous studies did not examine the some important aspects of health such as health seeking behaviour and access to health services and health inputs which are the focus of this study.

3. Methodology

3.1 Conceptual framework and Hypothesis

The relationship between microcredit and health related behaviour can be explained by employing household economic portfolio model (HHEP) originally developed by (Cohen, Chen & Dunn 1996), where researchers only explained the effect of credit on household resources and household activities. This study, however, only measures one of the implications of household economic portfolio model; which is hypothesized as (H₀): there is no significant difference on the health seeking behaviour and access to health services and health input of rural households of Bangladesh in the context of before and after joining the microfinance program among member households.

3.2 Study Area and Sample selection

The four districts of Bangladesh were selected for the field survey using the main criterion that there must be a Micro Finance Institutions (MFI) with clear eligibility criteria operates in the district. Three NGOs were selected by applying purposive sampling technique. The Development Initiative for Social Advancement (DISA) was chosen purposively because the organization received the first national promising MFIs award in the year 2009 from the Palli Karma- Sahayak Foundation (PKSF). The Grameen Bank (GB) and the Bangladesh Rural Advancement Committee (BRAC) were selected as they were the largest and most renowned MFIs in Bangladesh.

Member-households were sampled from a list of microfinance members in each village. It was planned to select 25 households per village, however some households could not be found or had no adult at home and hence could not be interviewed. Thus, the total number of households interviewed was 439, or about 22 households per village.

Two sets of pre-tested, structured questionnaires were administered to the sample households. The first questionnaire was related to selected villages which gathered data on the profile of the villages in terms of its location, resources, infrastructure etc. by means of key informant interviews with village leaders, union officials, community leaders and microfinance officials. The second questionnaire involved the information on general demographic and socioeconomic data used in analysis were furnished by the head of household. Moreover, specific information on recent household illness and related health-seeking behaviour was provided by the spouse of the household head (usually the women member of microfinance) or any knowledgeable adult household member present at the time of survey. Of relevance to this analysis, the other data collected are on sex (male or female), literacy (primary, secondary, higher or no education), and occupation of the household head including spouse and household's land holding status. Occupation was defined as the activity in which the household head spends the major part of the working day, and is categorized as labour-selling or non-labour-selling depending on whether the household has to depend on selling manual labour for at least 100 days a year for survival. Labour selling households tend to be of lower socioeconomic status given their dependence on variable seasonal employment. Land ownership was determined by asking the household to identify all land in their possession for which 'no one except the Government could take away their rights to usage'.

Specific information on recent household illness and related health seeking behaviour was provided by the spouse of the household head or any knowledgeable adult

family member of the family. Data on types of health care sought were obtained by asking the respondent about the situation of getting treatment which were subsequently grouped into six categories. The category 'antenatal care facilities' comprise the treatment or medicines provide for the natal care of babies. The category 'immunization' means whether the mother is duly immunized. The category 'diarrhoeal remedies' refers to any actions taken for the cure of diarrhoea of the child. The category 'family planning services' indicates whether the female respondents have been provided with materials and advices related to family planning. The category 'maternal care services' comprises the facilities provided during the tenure of maternity. The category 'malaria/TB treatment' indicates the rendering of medicines or mosquito net at the time of malaria sufferings. Finally, the category 'medicines accessibility' indicates the rendering of medicines or access to receive financial assistance at the time of illness.

3.3 Measurement of Variables

Dependent Variables

The dependent variables used in this study are health inputs, access to health service and health seeking behaviour of the households. We measure 'health seeking behaviour' and 'health input and service' by antenatal care facilities, immunization, diarrhoea remedies for children, family planning services, maternal care services and malaria/TB treatment. We have used sources of drinking water and toilet condition as measure of health input, as evidence (Al Mamun & Adaikalam 2011; Esmat Ara & Seddiky) suggest that these two factors are very important determinants of health status in low income countries, such as Bangladesh. Changes in health seeking behaviour and health inputs are measured on the basis of the extent of change occurred in nine selected dimensions of health behaviour, health services and health input of the households as a

result of their involvement with the microcredit program of the selected MFIs. The measurement of selected dimensions is as follows:

The sources of drinking water status of the households comprise three items namely 'deep tube well', 'shallow tube well', and 'river water'. The change of sources of drinking water of a respondent has been determined by the difference before and after joining microcredit program.

The toilet condition of the respondents comprises three items namely, 'full sanitary', 'half sanitary', and 'open'. The change in toilet condition is also determined by considering the difference before and after joining microfinance.

The health seeking behaviour and health service, namely 'antenatal care facilities provided', 'immunization provided', 'diarrhoeal remedies', 'family planning services', 'maternal care services', 'malaria/TB treatment' and 'medicines accessibility' of the respondents comprise from two 'yes' and 'no' answers. Respondents have been asked about their status before involvement and after involvement with microfinance program against the above mentioned issues.

Independent Variables

In this study, our main independent variable of interest is microcredit program of Grameen Bank, BRAC and DISA which is measured by the duration of involvement with microcredit program. This variable reflects the potential cumulative effects of participating in microfinance. We expected that households participate in microfinance program longer will have more positive effects. Other independent variables included in the analysis are log of household income per adult equivalent, age of the household head, ethnic minority status, education of household head, education of spouse, occupation, types of employment of the household head and spouse, number of household member and

dependency ratio. In relation to village characteristics, the variables considered are illiteracy rate, distance to health centre, wheat prices and casual labour rate.

3.4 Descriptive statistics

Table 1 presents health input, service and health seeking behaviour of the sample respondents and the percentage distribution of these dependent variables in the context of before and after joining microfinance operations. Table 1 shows that 43% of the households use shallow tube-well as sources of drinking water before joining microfinance programs. The number has reduced by 10% and the proportion of households using deep tube-well has increased by 12% after joining microfinance programs. On the other hand, 30% respondents used full sanitary latrine before joining microfinance while this figure went up by 99% after joining microfinance program which could refer to outstanding development. Similarly, in case of providing antenatal care facilities, 25% respondents were provided this services before joining microfinance programs while the number increased by 145% after joining the microfinance which showed tremendous improvement. The scenario of immunization has turned to be better after joining microfinance. Table 1 shows a 28% improvement in immunization after joining microfinance. A high increase (67%) on any kind of diarrhoea remedies for children has been revealed after joining the microfinance. Table 1 also shows that while after joining microfinance program, almost 60 % participants receive maternal care services which are 106% higher than before joining microfinance operations. And similarly, the number of participants who received family planning services has also increased by 87% after joining the microfinance. The contribution of microfinance towards malaria/TB treatment has found to be 108% more than before joining microfinance. A very significant portion of improvement has been made in case of medicines accessibility/ affordability to cure

diseases (77.7%) after joining microfinance which is 150% more than before which can be thought for a positive transition of their lives.

Table 1. Descriptive Statistics of Dependent Variables

Variable	Range	Before Joining MF		After Joining MF		Wilcoxon test (p-value)
		N	%	N	%	
<i>Health Input</i>						
Sources of drinking water	Deep Tube=1	194	53.3	218	59.9	0.000
	Shallow=2	156	42.9	140	38.5	
	River=3	14	3.8	6	1.6	
Toilet condition	Full sanitary=1	110	30.2	219	60.2	0.000
	Half sanitary=2	185	50.8	135	37.1	
	Open=3	69	19.0	10	2.7	
<i>Health Seeking Behaviour and Health Service</i>						
Any Antenatal care facilities provided	Yes=1	92	25.3	225	61.8	0.000
	No=0	272	74.7	139	38.2	
Any Immunization provided	Yes=1	249	68.4	318	87.4	0.000
	No=0	115	31.6	46	12.6	
Any kind of Diarrhoea remedies for children	Yes=1	178	48.9	297	81.6	0.000
	No=0	186	51.1	67	18.4	
Any kind of family planning services provided	Yes=1	151	41.5	283	77.7	0.000
	No=0	213	58.5	81	22.3	
Any kind of maternal care services received	Yes=1	104	28.6	214	58.8	0.000
	No=0	260	71.4	150	41.2	
Malaria/TB treatment	Yes=1	91	25.0	189	51.9	0.000
	No=0	273	75.0	175	48.1	
Medicines accessible/affordable for cure diseases	Yes=1	113	31.0	283	77.7	0.000
	No=0	251	69.0	81	22.3	

Source: Authors' Calculations based on Field Survey, 2014. Wilcoxon tests reveal that median responses of all health and sanitation conditions before and after participating in microfinance were significant at 1% level.

Respondents' health status were assessed on the basis of sources of drinking water, toilet condition, antenatal care, immunization situation, diarrhoea remedies, family planning facilities, maternal care services, malaria treatment and medicines affordability. Since all variables of interest are categorical, we use the Wilcoxon test to examine the differences in their median before and after joining microfinance. The test shows that

microfinance participation is associated with significant changes in all variables of interests. In particular, Table 1 shows that after joining microfinance there is significant changes in the situation of sources of drinking water despite the magnitude of changes are small. But participation in microfinance program was associated with substantial improvement in toilet condition (the rate of fully sanitary toilet is about double).

With regard to the antenatal care facilities provided, 225 out of 364 respondents reported that the antenatal care facilities are better than before participation. The rate of immunization has been improved substantially, which almost 28% is more compared to previous situation, due to participation in microfinance. There is also significant association between participation in microfinance and diarrhoeal remedies for children with the rate of treatment doubled.

Among other health seeking behaviour and health service related variables, there is also significant association between participation in microfinance and family planning services, maternal care services, malaria/TB treatment and medicines accessibility. Findings from this study indicate that there is substantial improvement on the above mentioned issues after joining the microfinance.

The descriptive statistics of the independent variables, presented in Table 2, shows that the average age of the household head is 40 years and 26 per cent of household heads have secondary or higher level of education. The average household size is about 5 and the average number of working age household member is about 3. Among the households surveyed, 12% households are from ethnic minority. Further to note that 43% of the households belong to unskilled occupation (farmers or low skills) whereas 77 % of the households possess full time employment. It is also revealed from the analysis that the total number of microfinance member is having with an average 31 months in

microfinance programs. The mean values of selected welfare indicators such as income per adult equivalent is BDT 97,978 per year (equivalent to US\$ 1260).

Table 2. Descriptive Statistics of Independent Variables

Variables	Unit/ Description	SD	Mean
Household characteristics			
Age of household head	Years	40.21	7.87
Ethnic minority	Yes=1	0.12	0.33
Education level	Secondary or above=1	0.26	0.44
Occupation	Farmers or low skills =1	0.43	0.50
Type of employment	Full Time = 1	0.77	0.42
Household size	Persons	4.79	1.29
People in labour age	Persons	2.84	1.17
Duration in microfinance	Months	31.66	28.28
Income per adult equivalent	BDT/year	97,978	55,285
Village Characteristics			
Illiteracy rate	Percentage	19.11	11.99
Distance to health centre	Kilometre	12.03	26.05
Wheat price	*BDT/kg	23.40	5.05
Casual labour	BDT/day	300	75

Source: Authors' Calculations based on Field Survey, 2014.

*BDT = Bangladesh Taka

Table 2 also shows that on an average the illiteracy rate in the village is 19%. The average distance to health centre from the village is 12%. Further to reveal that, the average wheat price is 23 BDT/kg, whereas the casual labour price is 300 BDT/day in the surveyed villages.

4. Econometric Specification

Only the relevant aspects of health seeking behaviour, health services and health inputs that the MFIs addressed in the credit forums were considered in selecting outcome variables. Two aspects such as before and after joining microfinance situation were focused on this study using nine variables. In both the situations, each woman was asked about the sources of drinking water, toilet condition, antenatal care, maternal care, family planning services, immunization, diarrhoea remedies, malaria/TB treatment, and accessibility to medicines. The change of the status has been considered as outcome variable. The duration of involving in microfinance is selected as independent variable due to its ability to represent the cumulative effects of microfinance and avoid the fungibility issue of money when using popular choices such as outstanding loans (i.e., we cannot differentiate effects of money from microfinance and other sources of credit).

The model being estimated is:

$$h_{ij} = \beta_0 + \beta_1 D_{ij} + \beta_2 \ln Y_{ij} + \beta_3 X_{ij} + \beta_4 V_j + \varepsilon_{ij} \quad \dots\dots\dots (1)$$

where:

h_{ij} Dummy variables representing changes in health seeking behaviour of the household i in village j after joining microfinance, in which one presents improvement and zero otherwise;

D_{ij} is the duration (years) that a household participated in microfinance;

Y_{ij} is the log of income per adult equivalent;

X_{ij} is the household characteristics;

V_j is the set of village characteristics ;

ε_{ij} is the idiosyncratic error term; and

$\beta_1, \beta_2, \beta_3$ and β_4 are parameters to be estimated.

Since the outcome variable is coded as binary (1 if household improve health and sanitation after participating microfinance and 0 otherwise), we choose logistic regressions to estimate Equation 1. The main advantage of this regression is that the selected type of parameters (odd-ratio) is easy to interpret. We also apply robust estimation of standard errors to take into account the presence of unknown heteroskedasticity.

5. Results and Discussions

Detailed results of the logistic regressions are presented in Table 3.

Immunization Provided

Our results show that participation in microfinance program significantly increases the odds of full immunization. In particular, the duration effect of microfinance on immunization is significant at 1% level, which suggest that the odds of improving immunization are 4:1 for members who joined MF for 2 years, 3:1 for members who joined MF for 3 years and 4:1 for members who joined MF for 4 years and beyond compared to the reference group (member for 1 year or less). The study also reveals that household head with secondary school are more likely to have improved immunization, whereas spouse education with secondary school is negatively associated with the improved immunization. Particularly, household head and spouse with secondary schooling have the odds of improving immunization by 2:1 and 0.5:1 respectively. Moreover, among village characteristic variables, village illiteracy rate, the distance to health centre and wheat prices were significantly and negatively associated (as the odds ratios are less than 1) with improved immunization status. In particular, one percentage point increases in the village illiteracy is associated with the odd of improving

immunization by 0.94:1, whereas the marginal effects of distance to health centre and wheat price are associated with the odds of 0.96:1 and 0.86:1, respectively.

Table 3: Effects of Microfinance on health input, health seeking behaviour and health services

Independent variables	Immunization		Diarrhoea		Antenatal care		Maternal care		Family planning		Drinking water		Toilet use		Malaria/TB		Medicines	
	OR	SE	OR	SE	OR	SE	OR	SE	OR	SE	OR	SE	OR	SE	OR	SE	OR	SE
Join MF for 2 years	4.04***	1.94	3.66***	1.42	2.72***	1.04	2.01*	0.76	2.03**	0.72	1.94	0.95	1.42	0.80	0.95	0.37	0.63	0.21
Join MF for 3 years	3.82***	1.86	2.14*	0.83	3.16***	1.18	2.00*	0.75	1.30	0.46	2.90**	1.55	2.07	1.30	1.90*	0.71	0.66	0.22
Join MF for 4 years or more	4.26***	2.25	2.11*	0.93	3.51***	1.48	1.15	0.51	1.38	0.56	0.78	0.39	1.51	1.01	2.37**	1.00	0.50*	0.19
Household characteristics																		
Age of household head (years)	1.00	0.02	1.03*	0.02	1.00	0.02	1.00	0.02	1.05***	0.02	1.02	0.03	0.96	0.03	1.00	0.02	1.01	0.02
Minority ethnics (minority=1)	0.62	0.28	0.25***	0.12	1.36	0.49	0.74	0.30	0.36**	0.15	1.92	1.11	2.79	2.20	0.36**	0.17	0.38***	0.14
HH head Secondary school	2.13**	0.75	1.64	0.54	1.82*	0.58	3.08***	1.06	1.80*	0.57	1.20	0.59	3.46	2.83	1.42	0.47	1.95**	0.61
HH head High School	1.74	1.45	0.84	0.71	0.22	0.25	4.11*	3.22	1.19	0.90	1.64	1.89	1.23	1.58	0.82	0.66	1.39	1.04
HH head College/University	1.60	2.02	1.35	1.58	0.61	0.78	1.24	1.61	0.88	1.03				0.80	1.00	0.58	0.71	
Education of spouse Secondary	0.51*	0.19	0.61	0.20	0.46**	0.15	0.29***	0.11	0.68	0.21	1.33	0.62	1.76	1.17	0.81	0.26	0.49**	0.15
Education of spouse High school	0.71	0.50	1.30	0.87	0.45	0.33	0.40	0.27	1.73	1.10	1.80	2.09	0.66	0.85	1.03	0.67	0.53	0.34
Occupation (farmers/labourers=1)	0.74	0.20	0.59**	0.15	0.97	0.23	1.29	0.32	0.88	0.21	0.76	0.27	0.80	0.34	0.63*	0.16	1.11	0.25
Type of employment(full-time=1 [±])	1.40	0.48	2.80***	0.91	0.80	0.23	0.61*	0.18	1.26	0.37	1.40	0.55	1.69	0.81	0.96	0.29	1.14	0.31
Number of people in the family	0.83	0.10	0.84*	0.09	0.95	0.10	0.82*	0.09	0.83*	0.08	0.98	0.14	1.03	0.17	0.80**	0.09	0.92	0.09
Dependency ratio	0.49	0.41	1.46	1.12	0.98	0.72	1.43	1.12	4.08*	3.12	2.80	2.90	6.38	7.87	0.94	0.74	2.46	1.76
Log of income per person	0.88	0.23	1.13	0.27	2.23***	0.20	1.91**	0.49	1.44	0.34	0.74	0.24	0.65	0.27	1.00	0.24	1.14	0.25
Village characteristics																		
Illiteracy rate (%)	0.94***	0.02	0.94*	0.03	0.99	0.02	0.96*	0.02	0.99	0.02	0.97*	0.02	1.01	0.04	0.99	0.02	0.98	0.02
Distance to health centre (km)	0.96**	0.02	0.99	0.02	0.89	0.06	0.77	0.24	0.77	0.26	0.92***	0.02	0.91***	0.02	1.01	0.01	2.55**	0.96
Wheat prices (Taka/kg)	0.86**	0.05	1.06	0.09	0.95	0.06	0.90	0.07	0.90	0.07	0.81***	0.05	0.81**	0.07	1.06	0.06	0.60***	0.07
Casual labour (Taka/days)	1.01	0.01	0.99	0.01	0.99	0.01	0.99	0.01	0.99	0.01	1.01	0.01	0.99	0.01	0.98**	0.01	1.03***	0.01
MFI=DISA [#]	0.97	0.31	0.93	0.28	1.24	0.37	1.04	0.32	1.39	0.42	0.63	0.29	0.55	0.31	1.35	0.42	0.72	0.21
MFI=BRAC [#]	0.83	0.34	0.96	0.36	1.57	0.58	1.26	0.48	1.65	0.60	0.82	0.47	1.34	1.05	1.41	0.55	0.93	0.33
chi2	27.38		56.95		43.72		43.07		37.87		16.17		20.77		20.84		22.29	
p	0.05		0.00		0.00		0.00		0.00		0.44		0.19		0.23		0.17	
Pseudo R2	0.069		0.119		0.090		0.093		0.078		0.060		0.101		0.048		0.044	

Note: .01 - ***; .05 - **; .1 - *; [#] Grameen Bank is used as reference category. [±] Full-time workers are mostly those who are involved with farming

Diarrhoeal remedies

Results from Table 3 show that participation in microfinance program significantly improves the odds of diarrhoeal remedial. The duration effect of microfinance on diarrhoeal remedy is significant at 1% and 10% level, respectively. It advises that the odds of improving diarrhoeal remedy is 3:1 for members who joined MF for 2 years, 2:1 for members who joined MF for 3 years and beyond compared to the reference group (member for 1 year or less). Among other variables, age of household head and type of employment were also found to be positively associated with the improved diarrhoeal remedial whereas minority ethnicity, occupation of the respondent, and number of people in the family were significantly and negatively associated with diarrhoeal remedial. In particular, those who belong to minority ethnic have the odds of improving diarrhoeal remedy by 0.25:1 compared with the majority groups. Also, households with full time employment have the odds of improving diarrhoeal remedy by 2.8:1 compared to households with part time employment. Further to mention that, occupation of the household head and number of people in the family have the odds of improving diarrhoeal remedy by 0.59:1 and 0.84:1 respectively. Moreover, among village characteristic variables, village illiteracy rate was negatively associated with diarrhoeal remedy, which suggest that one percentage point increases in the village illiteracy is associated with the odds of improving diarrhoeal remedy by 0.94:1, however it is found to be significant at 5% level.

Antenatal Care

Our results show that participation in microcredit program had a significant positive effect on the antenatal care services provided. In particular, the duration effect of microfinance on antenatal care is significant at 1% level, which suggest that the odds of

improving antenatal care are 2:1 for members who joined MF for 2 years, 3:1 for members who joined MF for 3 years and beyond compared to the reference group (being microfinance member for 1 year or less).

Other significant determinants of antenatal care include education of household head and spouse having secondary school and income per person. The result shows that antenatal care improves significantly and positively if household head has an education level of secondary school whereas the spouse education (secondary school) is negatively associated with improved antenatal care. In particular, the household head and spouse of household head with secondary schooling have the odds of improving antenatal care by 1.82:1 and 0.46:1 respectively. Moreover, income per person was found to be positively associated with receiving the improved antenatal care services, where the result shows that income per person has the odd of improving antenatal care by 2:1, which is significant at 1% level.

Maternal care

Table 3 shows that being a member of MF for more than 2 years but less than 4 years is positively related with improved maternal care. However, being a member for MFI for 4 years or more is not statistically significant because probably the mother is no more in child bearing age. Maternal care is likely to be improved for members with household heads who completed secondary school and high school, whereas spouse having completed secondary school is negatively associated. In particular, household heads with secondary and high schooling have the odds of improving maternal care by 3:1 and 4:1 respectively, whereas education of spouse having secondary schooling has the odds of improving maternal care only by 0.29:1. Also, among other household characteristics, income per person was significantly and positively associated with

receiving improved maternal care services, where income has the odds of improving maternal care by 2:1. However, type of employment and number of people in the family were significantly and negatively associated with improved maternal care, which indicates that the type of employment and number of people in the family have the odds of improving maternal care of 0.61:1 and 0.82:1 respectively. Moreover, among village characteristic variables, village illiteracy rate was significantly and negatively associated with maternal care, which suggest that the village illiteracy has only the odds of improving maternal care by 0.96:1.

Family Planning services

Table 3 shows that the longer duration of participation with the MFI does not have any impact on improvement on family planning services compared to shorter duration. However, if the duration of membership of MF is higher than 1 year but less than 3 years, then it is more likely to improve the odds of family planning services by 2:1 (5% significant). The probable explanation of this result is that senior members of microfinance may be above the reproductive age (the average age is 40 years which is in the border line of maximum reproductive ability), and hence less likely to require family planning. Although the odd-ratios for other years is also favourable (i.e. odds >1), but it is not statistically significant. Among other variables, age of household head, household head having completed secondary schooling, and dependency ratio were also found to be positively associated with the better family planning services, whereas minority ethnicity, and number of people in the family were significantly and negatively associated with improved family planning services. In particular, those who belong to minority ethnic have the odds of improving family planning services by 0.36:1 compared to the majority groups. Also, households with more number of people in the family have the odds of improving family planning services by 0.83:1, whereas the dependency ratio has the odds

of 4:1. Also, household head with secondary schooling will experience a significant improvement in family planning services with the odds of 1.8:1.

Sources of drinking water

Our results show that participation in the microfinance program significantly increases the probability of improved sources of drinking water. In particular, the duration effect of microfinance on sources of drinking water is significant at 5% level, which indicates that the odds of improving the condition of sources of drinking water is 2:1 for members who joined MF for 3 years compared to the reference group (became microfinance member for 1 year or less). Moreover, among village characteristic variables, village illiteracy rate, distance to health centre and wheat prices of village were significantly and negatively associated with condition of drinking water. In particular, the illiteracy rate has the odds of improving drinking water condition of about 0.97:1 but it is only significant at 10%. And the distance to health centre and wheat price have the odds of improving the drinking water condition is of about 0.92:1 and 0.81:1, respectively.

Toilet condition

Table 3 shows that duration of microfinance membership has no significant effects on the improvement of toilet condition, although the association is positive. The probable reason of this result is that the members has been enjoying the improved toilet facilities before joining the microfinance due to government and nongovernment initiatives that have already been implemented in those villages. Moreover, among village characteristics, distance to health centre and wheat prices of village were significantly and negatively associated with toilet condition. In particular, the distance to health centre has the odds of improving the toilet condition by 0.91:1, whereas the wheat price has the odd of about 0.81:1.

Malaria/TB treatment

Microfinance programs are significantly associated with the increased probability of improving malaria/TB treatment. In particular, the duration effect of microfinance on malaria/TB treatment is significant at 5% level, which indicates that the odds of improving the condition of malaria/TB treatment are 2:1 for members who joined MF for 3 years and beyond compared to the reference group (being microfinance member for 1 year or less). The improvement in access to malaria/TB treatment is less likely to occur, if household has more members and is from ethnic minority status. Those households who belong to ethnic minority have the odds of improving malaria/TB treatment of 0.36:1 compared to majority groups. Other significant determinants of malaria/TB treatment comprise occupation of the household head and number of people in the family, which are negatively associated with the improvement of malaria/TB treatment. In particular, household heads from the occupation of farmers/labourers have the odds to improve malaria/TB treatment of about 0.63:1 compared to other groups, whereas the number of people in the family has the odds to improve malaria/TB treatment of about 0.80:1. Also, among the village characteristic variables, casual labour price was significantly and negatively associated with malaria/TB treatment. Particularly, casual labour price has the odds of improving malaria/TB treatment is about 0.98:1.

Medicines accessibility

Our results show that participation in microcredit had a significant negative effect on the medicines accessibility. In particular, the odds of improving medicines accessibility after joining microfinance for 4 years and beyond is 0.50:1 compared to the reference group of those who joined for one year. Also households from ethnic minority and spouse education of the HH head having secondary schooling are less likely to have better access to medicines, whereas household heads with secondary schooling are more

likely to have improved access to medicines. Those households who belong to ethnic minority employment have the odds of improving medicines accessibility by 0.38:1 compared to majority groups. Household heads with secondary schooling have the odds of improving medicines accessibility is about 2:1, whereas education of spouse having secondary schooling has the odd of improving medicines accessibility of about 0.49:1. Moreover, among village characteristic variables, distance to health centre and casual labour price were found to be positively associated with medicines accessibility while wheat prices was found to be negatively associated. In particular, households with casual labour have the odds of improving medicines accessibility of about 1.03:1, whereas the distance to health centre has the odds of improving medicines accessibility is about 2.55:1.

Conclusion

This study has examined the impact of microfinance activities on health seeking behaviour and health services of rural households in Bangladesh. We found that the health seeking behaviour and health services of the households has been improved significantly after joining the microfinance program. We recommend that the policymaker related to health issues in developing countries should enhance their cooperation to achieve MDGs and strengthening of health system through intersectoral programming that utilizes a microfinance platform to reach poor and underserved populations. Our preliminary results on the beneficial health practices among the participants in microfinance can be used as a starting point for further studies investigating the links between microfinance and health seeking behaviour and health service of rural household. However, we were not able to disentangle, in this study, how much of this improvement in health care and health seeking behaviour is the result of the activities of MF or it is a general process of development undertaken by the government and policy makers. Furthermore, it is necessary for future research to explore whether there are substantial difference in the health seeking behaviour

between the treatment (member) and control (non-member) groups of microfinance institutions.

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