EFFECTS OF BRAC'S POVERTY REDUCTION PROGRAM TARGETING THE

ULTRA-POOR IN RURAL BANGLADESH

A Dissertation

Presented to the Faculty of the Graduate School

of Cornell University

In Partial Fulfillment of the Requirements for the Degree of

Doctor of Philosophy

by

Chowdhury Sufi Bhakta Jalal

August 2008

EFFECTS OF BRAC'S POVERTY REDUCTION PROGRAM TARGETING THE

ULTRA-POOR IN RURAL BANGLADESH

Chowdhury Sufi Bhakta Jalal, Ph.D.

Cornell University 2008

Poverty alleviation programs for the extreme poor improve participants' economic status and may also impact other important outcomes that are seldom evaluated. Challenging the Frontiers of Poverty Reduction/Targeting the Ultra Poor (CFPR/TUP), a program implemented by Building Resources Across Communities (BRAC), has been successful in significantly alleviating extreme poverty in rural Bangladesh. We hypothesized that the program also improved participants' subjective wellbeing and nutritional status (i.e., weight-for-height) of children, and decreased food insecurity, domestic violence, and distress. A non-equivalent pre- and post-test quasi-experimental design was used to test the hypotheses. Data were collected from a random sample of 1618 (640 program and 978 control) households across 261 villages under 38 BRAC Area Offices of 3 northern districts of Bangladesh in 2002 and 2005-2006. Linear mixed random-intercept models were used to control for the clustering effects and other potential confounders. Program households in 2006 were significantly better than the control households in women's subjective wellbeing ($p<0.001$) and weight-for-height of children between ages 24-35 months ($p<0.01$), and lower in food insecurity ($p<0.001$) and domestic violence ($p<0.01$). Reduced food insecurity was a substantial mediator of program effects on other outcomes. The results of this study are highly important as this is a large-scale program already extended to half of the country. Findings will contribute in judging the cost-benefit and cost-effectiveness of the program, and in garnering support for the expansion of such programs.

BIOGRAPHICAL SKETCH

Chowdhury Jalal was born on August 13, 1968, in Habigonj, a town in north-eastern Bangladesh. He was the third among five children born to Chowdhury Abdul Quayum, a banker and Chowdhury Faizunnessa, a housewife. The family moved to Dhaka while he was five and has lived there ever since. He finished secondary education from Adamjee Cantonment School in 1984 after having one year of schooling at Saltley Grammar School in Birmingham, England. He completed higher secondary education from Dhaka College in 1986 and started medical school in 1987. In 1994 Chowdhury earned his MD (MBBS) degree from Sir Salimullah Medical College under the University of Dhaka.

After graduation, he practiced medicine at KC Memorial Clinic, Dhaka for a couple of years and also studied for a postgraduate degree. Although intending to become a surgeon, his area of interest changed when he decided to join Building Resources Across Communities (BRAC) as Medical Officer (Research) in 1998 to learn more about nutrition and research. Being promoted to Research Associate, later on, he gained much experience in programmatic research and led the Nutrition Research Unit of Research and Evaluation Division for a year before coming to Cornell University to pursue his PhD degree.

Chowdhury Jalal has been professionally trained in different parts of the world. In June-July 2000, he attended training of the trainers program for nutrition professionals at University Philippines, Los Baños. He attended "Global Nutrition 2001" an information-technology-based nutrition course at Uppsala University, Sweden in February-March 2001.

In spring 2002 he first came to Cornell as a non-degree student. He was later accepted as a PhD student but could not come back to the US to start his program until spring 2004 due to immigration issues. His took International Nutrition as the major field of study while Epidemiology and Policy Analysis and Management were the minors. His major interest was in program evaluation. Mentored by Prof. Edward Frongillo, he evaluated Challenging the Frontiers of Poverty Reduction-Targeting the Ultra Poor (CFPR-TUP), a BRAC program designed for the poorest of the poor.

While studying medicine Chowdhury Jalal played an important role as a student leader and was elected as General Secretary (1991-92) and Vice-President (1993-94) of the Student's Union. Later, in his professional life, he also held the position of Organizing Secretary of Doctor's Association of Bangladesh. During 2002-2003 he also volunteered to be the Vice-Chairman, Medical Committee of Bangladesh Cricket Board.

Amid his academic demands and professional growth, he managed a bit of leisure on the soccer field and snooker tables.

Chowdhury Jalal got married to Syeda Farzana Yasmin in February 1998 and is blessed with two daughters, Nishwara and Niyoosha.

This dissertation is dedicated to my loving

parents. Without their knowledge, wisdom,

sacrifice, and guidance, I would not have the

goals I have to strive and do my best to

reach my dreams.

ACKNOWLEDGMENTS

I would like to acknowledge and extend my heartiest gratitude to all study subjects of Rangpur, Kurigram, and Niphamari for their time, cooperation, and sharing of knowledge. The transformation of the knowledge learnt at the field level into a scholarly dissertation would not have been possible without the contribution that the following people and institutions have made.

Academic contribution

I want to start off by showing my sincerest gratitude to my Special Committee Chair Edward Frongillo for his constant guidance and support throughout the Ph.D. program. Ed was always there to meet and talk about my ideas, brought out the good thinking in me and gave me the appropriate advice. He showed me the different ways to analytically approach and address a research problem and helped me find the important and interesting issues out of my data which I could not have found otherwise. I am thankful to him for the prompt responses during proposal and dissertation writing, for asking questions to help me think through my problems and teaching me how to write scientific academic papers. I am grateful for the amount of time that he has spared for me, especially during dissertation writing and defense. He made the Department of Health Promotion, Education, and Behavior at University of South Carolina a wonderful workplace and home for the past year by extending space and logistic supports. I further want to show my appreciation to Ed and his wife Marguerite Frongillo for hosting me as a family member during the initial months of my stay in South Carolina and for having a great impact in my social life. (More importantly, Ed taught me how to work hard and still continue to play soccer hard to stay away from injury!).

Special thanks goes to the committee co-chair, Jere D Haas, who guided me towards more effective research design. With his insightful review and comment I could make important positive changes and made stronger arguments in the dissertation. Jere was always available to discuss research issues and extending other administrative cooperation.

I would like to thank the Charles McCormick, Field Representative and Donald Kenkel, minor advisor for their scholarly inputs in my research. I am grateful to them for allowing me walk into their office anytime and solve issues instantly.

Besides committee members, Kathleen Rasmussen was the key support for me during my stay in Ithaca. She played the most important and caring role in bringing me to Cornell University, provided necessary funding, health insurance of my family, and took up the challenge to fight the immigration issues for a year and bringing me back to Cornell. I am grateful to Kathy for all her support.

Support from BRAC

I would like to acknowledge and extend my heartfelt gratitude to A Mushtaque R Chowdhury, Dean, School of Public Health at BRAC University and Deputy Executive Director, BRAC for nominating me from BRAC for this opportunity. Without him I would not have had such exposure to the scientific world and be at Cornell University at all. I thank him for allowing me to take the time away from my work for the PhD program.

My sincere gratitude to Imran Matin, Director Research, BRAC for his constant support from the inception of my dissertation research. He extended all cooperation to

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

CHAPTER ONE

INTRODUCTION

Despite reports of poor governance, Bangladesh has recorded considerable success in economic and social sectors over the past decade (WB 2006). Government's macroeconomic policies and implementation of developmental programs partnered with non-government organizations has played a major role in bringing about this success. Building Resources Across Communities (BRAC) is one of the largest developmental organizations in Bangladesh which serves a population of 110 million covering all districts of the country. BRAC has been successful in the implementation of a micro-credit based poverty reduction program for nearly a third of a century and has improved women's empowerment and contributed to social development to a considerable extent. Such conventional poverty reduction programs, however, often miss the poorest segment of the poor. Based on decades of experience and scientific evidences BRAC designed a new program to specifically target these missed out population. In 2002 BRAC launched a new poverty reduction venture; "Challenging the Frontiers of Poverty Reduction-Targeting the Ultra Poor (CFPR-TUP)". The CFPR-TUP program supports the women of extreme poor households through providing income generating opportunities, building an asset base, training to improve life skills and build capacity, and improving and strengthening livelihood conditions. After a grant phase of 18 months, the participants are expected to be able to join BRAC's mainstream microcredit program.

The program has a built-in research design that allowed BRAC to periodically evaluate the program and provide necessary feedback mainly on the programmatic issues. Numerous publications on this program provide scientific evidence that the

program has successfully targeted the extreme poor population and alleviated poverty to a significant extent (BRAC-RED 2004; Barua and Sulaiman 2006; Sulaiman and Matin 2006). In addition, research showed the program's positive impact on health, health-seeking behavior, food insecurity, food consumption, and social development (Ahmed and Rana 2005; Haseen 2006; Prakash and Rana 2006). Apart from these findings, the impact of the program could potentially also be translated to several other benefits in human terms that have not been measured. Understanding these benefits would make important contributions to documenting the quality of the lives of the participants which is the prime mission of BRAC (BRAC 2007). On the other hand, it is also possible that the program has some unintended negative consequences. Understanding the effect of the program on such outcomes by the program may contribute potentially in judging the cost-benefit and cost-effectiveness of the program, and draw more support in favor of the expansion of existing programs and establishing such new initiatives.

The first aim of this dissertation is to evaluate whether or not BRAC's CFPR-TUP program has an effect on several outcomes which the program had not measured earlier and could have potentially benefited or possibly affected negatively. A second aim is to investigate the impact of the program on nutritional status of women aged 15-45 years, and to examine the differential impact of the program on certain age categories of children under age 5 years. A third aim was to investigate how the program may have exerted its effects on distress and wellbeing, and which factor or factors were the most important mediators of the program effects.

Structure of the dissertation

The dissertation is fashioned with six chapters including this one. Chapter Two presents a literature review relevant to the specific aims covering background of this research and the scientific evidence under which the hypotheses were built. This Chapter will also provide details of the programmatic context. The next three chapters present the research design, results, and discussion around the three aims listed above. Chapter Three address the first research aim and shows the effect of the program on measured and perceived economic status, wellbeing, child discipline, parental care for early childhood learning, food insecurity, domestic violence, and distress. Chapter Four addresses the second specific aim with a different design, methodology, and sample size. Chapter Five shows how the programs affects distress and brings about changes in the overall quality of life of its participants. Chapter Six provides general conclusions drawn from the three studies, discusses the strengths and limitations of our research, and presents possible implications of the research from the organizational and scientific points of view.

REFERENCES

Ahmed, S. M. and A. M. Rana (2005). Customized Development Interventions for the Ultra Poor: Preliminary Change Assessments of Health and Health-seeking Behaviour (CFPR/TUP 2002 to 2004). CFPR/TUP Working Paper Series No. 7. Dhaka and Ottawa, BRAC and Aga Khan Foundation.

Barua, P. and M. Sulaiman (2006). Targeting the Poorest in Microfinance: Poverty Outreach of BDP Ultra Poor Programme. CFPR/TUP Working Paper Series No. 13. Dhaka and Ottawa, BRAC and Aga Khan Foundation Canada.

BRAC-RED (2004). Stories of Targeting: Process Documentation of Selecting the Ultra Poor for CFPR/TUP Programme. CFPR/TUP Working Paper Series No. 1. Dhaka and Ottawa, BRAC and Aga Khan Foundation Canada.

BRAC (2007). BRAC Annual Report 2006. Dhaka, BRAC.

Haseen, F. (2006). Change in Food and Nutrient Consumption Among the Ultra Poor: Is the CFPR/TUP Programme Making a Difference? Working Paper No.11. Dhaka and Ottawa, BRAC and Aga Khan Foundation Canada.

Prakash, V. A. and A. M. Rana (2006). Self-perceived Health of Ultra Poor Women: The Effect of an Inclusive Development Intervention. CFPR/TUP Working Paper Series No. 10. Dhaka and Ottawa, BRAC and Aga Khan Foundation.

Sulaiman, M. and I. Matin (2006). Targeting Effectiveness of CFPR/TUP in Scale-up Environment. CFPR/TUP Working Paper Series No. 8. Dhaka and Ottawa, BRAC and Aga Khan Foundation Canada.

WB (2006). Country Assistance Strategy For The People's Republic Of Bangladesh. Report No. 35193, The World Bank.

CHAPTER TWO

LITERATURE REVIEW

BACKGROUND

Bangladesh is a South Asian country with a population of 140 million living in an area of merely 144,000 square kilometer (BBS 2003). The people of Bangladesh, especially those living in rural areas, are vulnerable to natural calamities such as flood, cyclone, and drought. These adversities, along with the context of poor governance, turbulent politics, and high population density push the poverty rate to remain at a higher limit, ranking the country as least developed, low-income, and food-deficient (WFP 2004; WB 2006). Despite many such constraints, macroeconomic performance and service delivery to rural areas has improved significantly in response to increased social sector expenditures, better program and policy design, more effective partnerships between government and NGOs in service delivery and improving instruments for donor support (BRAC 2001). The country has achieved steady economic growth of 4-5 percent annually, relatively low inflation, and fairly stable domestic debt, interest, and exchange rates. The overall record on poverty reduction has shown considerable success over the recent years. Poverty, defined as average per capita food consumption of less than 2122 kilo calories per day declined from 59 percent in 1991 to 50 percent in 2000 (BBS 2004) (WB 2004). Even with such progress, poverty still remains one of the major concerns for Bangladesh partly because the extreme poor, defined as those consuming an average intake of below 1805 kilo calories per day, has been left out of the conventional approaches of poverty reduction programs offered both by the Government of Bangladesh (GoB) and non-government organizations (NGO) (BBS 2004). These extreme poor are over 20% of the total population of the country (BBS 2003).

Programmatic context

Challenging the Frontiers of Poverty Reduction-Targeting the Ultra Poor (CFPR-TUP) is a poverty reduction strategy through income generating activities (IGA) implemented by BRAC, a non-government organization (NGO) in Bangladesh. More than half of the women among ultra-poor households suffer from malnutrition (Body Mass Index<18.5). Ultra poor households are defined as those consuming an average intake of below 1805 kilo calories per day. The prevalence of severe malnutrition (weight-for-age <-3SD) among children under age 5 years of these households is double the national average (Ahmed and Rana 2005). Mother's psychosocial stress owing to poverty is one of the many factors affecting health and nutrition through both biological effects and changes in health behaviors. So far, the program has not been evaluated in terms of nutritional outcomes. Likewise, the relationship between psychosocial stressors and subjective (i.e., perceived) wellbeing, care-giving practices, and nutritional status has not been evaluated in the context of this program.

Challenging the Frontiers of Poverty Reduction- Targeting the Ultra Poor

Based on more than 25 years of experience in program operation aimed at poverty alleviation and empowering the rural poor through its development program, BRAC an NGO in Bangladesh, has developed a new poverty reduction strategy called "Challenging the Frontiers of Poverty Reduction- Targeting the Ultra Poor (CFPR-TUP)". This broad-based and multidimensional program attacks extreme poverty through specific income generating activities (IGA) and strengthened socio-political assets of the poor. CFPR-TUP is a unique comprehensive poverty reduction strategy considering that this program is nested in a larger, effective, well-tested, and self-sustainable program that has been running for more than 30 years in rural Bangladesh. Nilphamari, Kurigram, and Rangpur are the first 3 out of 64 districts in Bangladesh

where the program was first launched in 2002 with a goal of bringing all districts under the program in phases.

Targeting ultra poor: The program first identifies ultra poor households through participatory wealth ranking involving the village community. These households undergo a multistage verification procedure conducted by the Program Organizers (PO), Area Office Managers, and Regional Managers or Head Office personnel. To be qualified to participate in the program, households need to satisfy at least two of the four inclusion criteria and dissatisfy both exclusion criteria mentioned in Table 2.1.

Table 2. 1: CFPR-TUP Household selection criteria

Targeting indicators

Inclusion criteria (need to satisfy at least 2)
1) Dependence upon female domestic work or begging
2) Owning less than 10 decimals (0.01 hector) of land
3) No adult active male members in the household, and
4) School-age children have to take up paid work.

Exclusion criteria (need to dissatisfy both)
1) There should be at least one adult, active woman in the household capable of performing income generating activity (IGA).
2) No household member should be a member of any other development program or NGO.

The intervention: An appropriate income generating activity (IGA) is identified for the participant immediately after the selection is process is over. The participants are

then provided intensive need-based technical training and basic entrepreneurial skills to improve income earning capacity. At the same time, the program transfers income earning assets and/or wage employment opportunities which are followed by subsistence allowance for short-term income support. The participants also enjoy other important services provided by BRAC, such as basic health care, nutrition education, schooling, and IGA product marketing (BRAC 2001; BRAC 2004). Unlike the mainstream BRAC Development Program (BDP) where services are delivered through a group comprising approximately 30 women, each participant in CFPR-TUP program is individually monitored and supervised by a trained PO.

Social Development Program: This component of CFPR-TUP provides support and counseling on developing participant's livelihood strategies and coping with crisis (BRAC 2001). To strengthen the socio-political assets of the participants the program added an awareness and confidence building component which is achieved through two steps. First, by forming Ward Association (*Polli Shomaj*), it provides support for an organizational base to give voice to the poor. Secondly, effective advocacy is made through holding informal discussions on legal rights, gender and relevant socio-political issues so that the voice is heard and they get better responses from all local-level institutions, formal or informal, government or private.

All IGA-related inputs are provided along with specially designed, flexible, savings services to meet their transaction demands or to deal with emergencies. Over a period varying between 12 to 24 months, approximately 80% of the participants graduate out of the program and become members of BDP. Those who failed to successfully graduate from the program are offered an extension for a second round of inputs.

Research activities: CFPR-TUP has a strong built-in research component to constantly monitor and evaluate the program based on economic, social development, education, health, and nutrition indicators. The Research and Evaluation Division (RED) of BRAC is responsible for assessing and providing analytical inputs for more effective program and to bring about positive changes in the lives of the poor. RED also conducts research to allow a better understanding of the various dimensions of the livelihoods of the very poor and their existing operational dynamics, and to identify possible impact pathways. The program collected two waves of data including a baseline on 12,907 households. As many as 6,673 of these were ultra poor households as ranked by the community during the participatory wealth ranking and later selected by the program according to its targeting criteria. These households are called selected ultra poor (SUP) (i.e., program households). To serve as controls, another group of 6,234 households was selected from the households that were initially selected but were later not included in the program. These households did not meet the stringent inclusion or exclusion criteria or both of CFPR-TUP and were excluded during the multistage verification procedure. Therefore, the intervention assignment cannot be termed as truly random. These control households did not receive any intervention and are considered as not-selected ultra poor (NSUP) (i.e., control households) by BRAC.

Another round of data collection has been done in 2005 on the same samples of 2002 baseline administering most of the questionnaires used during that earlier survey. Numerous descriptive publications have been done on the baseline survey including nutrition as cited in the following chapters (BRAC 2004; Hossain and Matin 2004; Ahmed and Rana 2005; BRAC 2005; Prakash and Rana 2006; Sulaiman and Matin 2006; Sulaiman, Matin et al. 2006). Like many other such poverty reduction programs, however, the evaluation of economic programs in terms of psychosocial outcome has

been largely unexplored. Owing to its importance, we proposed to collect another round of data in July-September 2006 on psychosocial stressors, wellbeing, care-giving and anthropometry with a hope to provide BRAC with appropriate policy recommendations and generate scholarly information on this special population.

Rationale for selecting outcome measures

Malnutrition as a problem: In Bangladesh approximately 47.7% of children under age 5 years are under weight (weight-for-age <-2SD), 45% are growth stunted (height-for-age <-2SD) and 10% are wasted (weight-for height <-2SD) (BBS 2003). About 52% of women aged between 15-49 years are considered underweight (Body Mass Index <18.5) (WHO 2006). Of these 47% are dangerously underweight at the onset of pregnancy. The scenario is much worse within ultra poor households. Figure 2.1 reveals the interplay of poverty, food insecurity, lack of access to health services, and lack of proper caring practices in the causality of malnutrition (Yusuf 2004). Recent literature suggests a much stronger effect of income on malnutrition among the poorest quintile (Deolalikar 2004). Thus alleviation of extreme poverty should effectively reduce the prevalence of malnutrition in ultra poor households. We hypothesized that after four years of successful program implementation there will be a significant difference in nutritional status of women aged 15-45 years and children under age 5 years between baseline and 2006 households.

Poverty
Lack of access

Food security

Health services

Malnutrition

Poverty

Lack of education
and knowledge

Caring practices
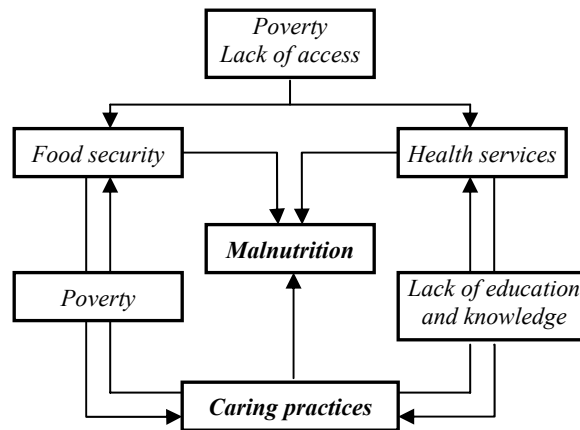
Figure 2.1: Factors interplaying in the causality of malnutrition (Yusuf 2004)

Wellbeing as a measure of program evaluation: Measuring quality of life through self-evaluation is a recent idea that has captured the attention of both researchers and clinical practitioners (Cummins, Gullone et al. 2002). Subjective wellbeing is the most commonly used philosophy to describe what is non-instrumentally or ultimately good for a person. Schwartz and Strack defined subjective wellbeing as the individual's current evaluation of his/her happiness (Schwartz and Strack 1999). On the other hand Ed Diener defines it as a broader domain involving a number of separable components such as life satisfaction, (global judgment of ones life), satisfaction with important domains (work satisfaction), positive affect (experiencing many pleasant emotion and moods), and low levels of negative affect (experiencing few unpleasant emotion and moods) (Diener 2000). Despite this diversity at this fundamental level of understanding wellbeing, there are increasing focus on evaluating quality of life in terms of subjective or perceived wellbeing (Gullone and Cummins 2002). At the same time policy makers are also emphasizing evaluating programs in terms of wellbeing of the participants. Similar trend has been seen in BRAC senior management who has also shown considerable interest to understand how and to what extent empowerment

and poverty alleviation, two goals of BRAC, would change its participant's subjective quality of life. Previous studies show that at early stage of the program implementation micro-credit has little, if any, influence on participant women's wellbeing (Ahmed, Chowdhury et al. 2001). This may be in part due to the fact that women's involvement in income generation activities (IGA) by itself as well as constant anxiety of timely repayment of credit keeps them in some degree of stress. We expect that the situation would reverse over time as women become more experienced with IGA and their ability to cope with the adverse situation increases owing to the empowerment they are likely to enjoy (Ahmed, Chowdhury et al. 2001).

Care-giving as an indicator of program outcome: Care refers to the behaviors and practices of caregivers to provide the food, health care, stimulation, and emotional support necessary for children's healthy survival, growth, and development (Engle 1999). Not only the practices themselves, but the ways they are performed in terms of affection and responsiveness to the child, are critical to a child's wellbeing. Importance of care is emphasized in UNICEF's conceptual framework (1990) which also highlights how care translates food security and health and other resources into child development (Figure 2.2) (UNICEF 1998). Maternal care is an important factor in utilizing all available resources for child-care and the care offered by mothers is largely influenced by their psychosocial status in response to stressors, such as poverty, food insecurity, domestic violence, and socio-political constraints (Engle and Ricciuti 1995). We therefore hypothesized that reducing level of stressors would significantly improve child-care practices of ultra poor mothers.
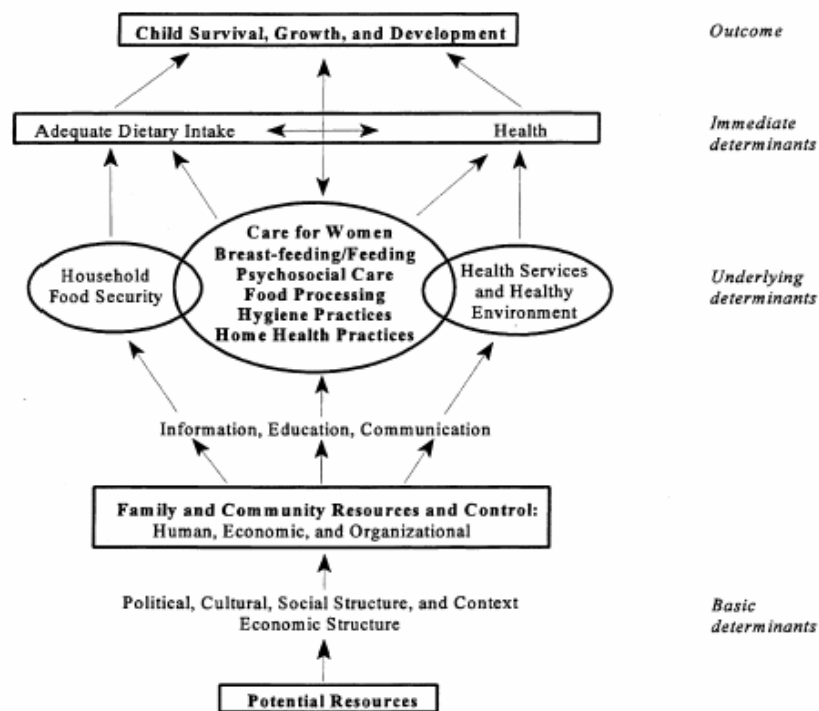
Figure 2.2: UNICEF conceptual model on child survival, growth and development

Psychosocial stressors and their effects on outcome variables

Stress is a condition when environmental demands tax or exceed the adaptive capacity of an organism, resulting in psychological and biological changes that may place a person at a risk of disease (Cohen, Kessler et al. 1995). It is a consequence of certain life events and/or stressors resulting in negative emotional responses that leads to increased risk of adverse physical and psychiatric states or diseases. Pre-exposure to both acute and chronic uncontrollable environmental stressors produce learned helplessness which eventually increases the level of stress (Evans and Stecker 2004). Two distinct types of stressors, chronic and acute or daily hassles, contribute in unique ways in developing such consequences. For this proposed study we identified four major measurable chronic stressors (i.e., poverty, food insecurity, domestic violence,

and socio-political constraints) that could be influenced by CFPR-TUP program over a period of time. These stressors are also likely to directly affect the ultra poor women's wellbeing, care-giving practices, and nutritional status (Bruce, Takeuchi et al. 1991). Ultra poor women also confront daily hassles or acute stressors to a considerable degree. For example events such as severe morbidity and mortality of a household member, natural disaster resulting in loss of asset, incidence of burglary, expenses of recent marriage or unable to arrange marriage for daughters, and clashes within/between villages add to their stressful life events. The cumulative effect of all these stressors increases the level of psychological distress. Our goal was not to study all of the effects of distress on outcome indicators; rather we will investigate the effect of stressors that are potentially alleviated by CFPR-TUP program.

Many of these acute stressors are considered as social constraints that could be alleviated by the Social Development Program component of CFPR-TUP as well as by the overall effect of empowerment of the ultra poor women. For example, building awareness at the community level against dowry added by legal rights education provided to the ultra poor women puts them in a better position in social bargaining.

Food insecurity as a stressor:

Food insecurity is a stressor that can be reduced considerably by alleviating poverty and empowering the poor, BRAC's two major goals. Food insecurity is a state in which people experience the physical unavailability of food, lack of social or economic access to adequate food, and/or inadequate utilization of food. Factors that affect household resources as well as adequate utilization of those resources for acquisition of food pose risk to food insecurity (Campbell 1991). In Bangladesh, women and children are vulnerable to chronic food insecurity that leads to poor

nutrition in terms of anthropometric, biochemical and clinical outcome and ultimately affect health and quality of life negatively. Figures 2.1 and 2.2 shows the causal relationship between poverty, food security, malnutrition, and care-giving practices (Yusuf 2004).

Domestic violence as a stressor:

The World Health Organization defines domestic violence against women as "Any act or omission by a family member (most often current or former husband), regardless of the physical location where the act takes place, which negatively affect the well being, physical or psychological integrity, freedom or right to full development of a woman" (WHO 2000). In Bangladesh domestic violence is predominant among the whole range of violence carried out against women regardless of the neighborhood in which they live (Naved 2003). About 60% of women experience some degree of physical or sexual abuse or both some time during their life course (Naved; Ahmed 2005). Studies on BRAC members show that the length of membership is negatively associated with level of domestic violence against women (Ahmed 2005).

Stress and wellbeing: Emotional stress resulting from poverty and related conditions leads to the development and/or maintenance of common mental heath problems such as anxiety and depression (Rodgers 1991; Weich and Lewis 1998). Both chronic stressors and daily hassles or acute stressors have unique effects on psychological distress (Serido, Almeida et al. 2004), although a large body of literature suggests that chronic stressors have stronger effect on wellbeing compared to the major but less frequent life events (Pearlin 1982; Lazarus and Folkman 1984; Repetti and Wood 1997).

Disadvantaged ultra-poor women are more likely to experience stressful life situations leading to episodes of mental illness lowering the sense of wellbeing. Psychosocial stressors and resources, such as CFPR-TUP program, are forces that affect psychological distress, an indicator of wellbeing, through various mechanisms (Ensel and Lin 1991). We used the stress-suppressing model to test the hypothesis that the CFPR-TUP program, as a resource, reduces distress through reducing some of the stressors to which the extreme poor households are likely to be exposed (Ensel, Peek et al. 1996). Using food insecurity as an example of stressors, the following figure depicts our conceptualization. We would expect from our research that the direction of the estimates would be the same as it is in the stress-suppressing model (Figure 2.3).

Stress-suppressing model   Our model
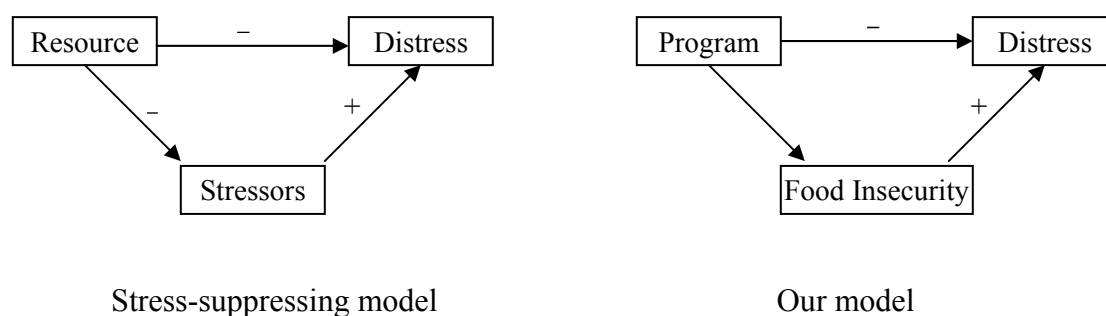
Figure 2.3: Comparison of stress-suppressor model with our model

Stress and care-giving: Given the level of poverty and the stressful life situations of ultra poor mothers, compared to their better off counterparts, it is unlikely that these mothers would effectively utilize resources available to them. Children of low income households themselves are also confronted with a higher level of cumulative, multiple stressors as do their mothers pushing them more towards a vulnerable situation in terms of child growth and development (Evans and Stecker 2004). Enhanced care-

giving can optimize the use of existing resources to improve health and nutrition in women and children even when poverty causes food insecurity and limited health care, (Engle 1999). IGA, the major intervention of CFPR-TUP strengthened by its Social Development component, targets constraints such as women's control over resources and household decision making. These two factors play an important role in the ability of mothers to mobilize resources towards child care, especially the female child.

The psychosocial stress environment of children is also divided into proximal or acute and distal or chronic aspects (Friedman and Wachs 1999). Proximal aspects of the environment are directly experienced by the child, and include both physical and social dimensions, whereas distal aspects of the environment are concerned with resources such as availability of food on a daily basis or the energy and knowledge of a primary caregiver (Engle and Menon 1999). Care practices or behaviors are proximal aspects of the environment that are primarily social, and influence children's growth and their development. For the purpose of this research, we are specifically interested in examining the behavior and practice of mothers in dealing their children during adverse behavior of their child. We assume that there will be differential attitude towards their children owing to the degree of stressors to which the mothers are exposed.

Stress and nutrition: There is also increasing evidence that psychosocial factors may affect health through both biological effects and changes in health behaviors. Among these, food choices and dietary intakes could be affected by psychosocial factors and lead to poor nutritional status and health. While psychological distress is associated with biological changes that might be expected to reduce food intake, experimental studies yield inconsistent results (Herman, Polivy et al. 1987; MD and MD. 1997;

Laitinen, Ek et al. 2002). No study has been reported on the ultra poor population to test this hypothesis. Household food insecurity is associated with adverse emotional, behavioral, mental and physical quality of life in children and adults (Casey, Goolsby et al. 2004) (Connell, Lofton et al. 2005) (Bhattacharya, Currie et al. 2004). Individuals in food insufficient households are 3.5 times more likely to suffer from major depression than individuals in food sufficient households (Vozoris and Tarasuk 2003). In Bangladesh rural women are somewhat food insecure even under the best circumstances (Edward A. Frongillo, Chowdhury et al. 2003). Women of the ultra-poor households are more vulnerable and suffer from chronic food insecurity and severe malnutrition. More than 52% of SUP households could not afford two meals a day before they had joined CFPR-TUP program (BRAC 2004). On average, they can afford to consume only around 1,800 calories daily, which is far below the recommended daily average of 2,300 calories (WFP 2004). These women are also vulnerable to environmental stress from natural disasters, such as floods, which often deprive them of whatever few physical assets they have managed to create (WFP 2004).

REFERENCES

Ahmed, S. M. (2005). "Intimate Partner Violence against Women: Experiences from a Woman Focused Development Program in Matlab." Journal of Health, Population and Nutrition **23**(1): 95-101.

Ahmed, S. M., M. Chowdhury, et al. (2001). "Micro-credit and Emotional Well-Being: Experience of Poor Rural Women from Matlab, Bangladesh." World Development **29**(11): 1957-1966.

Ahmed, S. M. and A. M. Rana (2005). Customized Development Interventions for the Ultra Poor: Preliminary Change Assessments of Health and Health-seeking Behaviour (CFPR/TUP 2002 to 2004). CFPR/TUP Working Paper Series No. 7. Dhaka and Ottawa, BRAC and Aga Khan Foundation.

BBS (2003). Demographic and Health Survey 1999-2000, Bangladesh Bureau of Statistics.

BBS (2003). Population Cesuss-2001, National Report (Provisional), Bangladesh Bureau of Statistics.

BBS (2003). Report of the Household Income and Expenditure Survey, 2000. B. B. o. Statistics.

BBS (2004). Local Estimation of Poverty and Malnutrition in Bangladesh. B. B. o. Statistics, Government of People's Republic of Bangladesh.

Bhattacharya, J., J. Currie, et al. (2004). "Poverty, Food Insecurity, and Nutritional Outcomes in Children and Adults." J. Health Econ **23**: 839– 862.

BRAC (2001). Overview Proposal: Challenging the Frontiers of Poverty Reduction: Targeting the Ultra Poor- Targeting Social Constraints, BRAC, Research and Evaluation Division.

BRAC (2004). Towards a Profile of the Ultra Poor in Bangladesh: findings from CFPR/TUP Baseline Survey, BRAC.

19

BRAC (2005). CFPR-TUP Baseline nutrition survey 2003, BRAC, Research and Evaluation Division.

Bruce, M. L., D. T. Takeuchi, et al. (1991). "Poverty and psychiatric status: Longitudinal evidence from the New Haven epidemiologic catchment area study." Archive of General Psychiatry **48**: 470-474.

Campbell, C. C. (1991). "Food Insecurity: A Nutritional Outcome or a Preditor Variable." Journal of Nutrition **121**(3): 408-415.

Casey, P., S. Goolsby, et al. (2004). "Maternal depression changing public assistance, food security and child health status." Pediatrics **113**(298-304).

Cohen, S., R. C. Kessler, et al. (1995). Strategies for Measuring Stress in Studies of Psychiatric and Physical Disorders. Measuring Stress. S. Cohen, R. C. Kessler and L. U. Gordon, Oxford University Press**: 3-26.

Connell, C. L., K. L. Lofton, et al. (2005). "Children's Experiences of Food Insecurity Can Assist in Understanding Its Effect on Their Well-Being." Journal of Nutrition **135** 1683–1690.

Cummins, R. A., E. Gullone, et al. (2002). A Model of Subjective Well-being Homeostasis: The Role of Personality. A Model of Subjective Wll-Being Homeostasis: The Role of Personality. E. Gullone and R. A. Cummins, Kluwer Academic Publishers. **16:** 7-46.

Deolalikar, A. (2004). Poverty and child malnutrition in Bangladesh. South Asia Region working paper, World Bank. **1**.

Diener, E. (2000). "Subjective Well-Being: The Science of Happiness and a Proposal for National Index." The American Psychologist **55**(1): 34-43.

Engle, P. (1999). The Role of Caring Practices and Resources for Care in Child Survival, Growth, and Development: South and Southeast Asia. Asian Development Review. J. Lee, Asian Development Bank. **17:** 132-167.

Engle, P. L. and P. Menon (1999). "Care and Nutrition: Concepts and Measurement." World Development **27**(8): 1309-1337.

Engle, P. L. and H. N. Ricciuti (1995). "Psychosocial aspects of care and nutrition." Food and Nutrition Bulletin **16**(4): 356-377.

Ensel, W. M. and N. Lin (1991). "The Life Stress Paradigm and Psychological Distress." Journal of Health and Social Behavior **32**(4): 321-341.

Ensel, W. M., M. K. Peek, et al. (1996). "Stress in the life course: A life History Approach." Journal of Aging and Health **8**(3): 389-416.

Evans, G. W. and R. Stecker (2004). "Motivational consequences of environmental stress." Journal of Environmental Psychology **24**(2): 143-165.

Friedman, S. L. and T. D. Wachs (1999). The Child Care Environment: Conceptualizations, Assessments, and Issues Measuring Environment Across the Life Span : Emerging Methods and Concepts S. L. Friedman and T. D. Wachs. Washington D.C., American Psychological Association Press.

Frongillo, E.A., N. Chowdhury, et al. (2003). "Understanding the Experience of Household Food Insecurity in Rural Bangladesh Leads to a Measure Different from That Used in Other Countries." Journal of Nutrition **133**(12): 4158-4162.

Gullone, E. and R. A. Cummins, Eds. (2002). The Universality of Subjective Wellbeing Indicators: A Multi-disciplinary and Multi-national Perspective. Social Indicators Research Series, Kluwer Academic Publishers.

Herman, C. P., J. Polivy, et al. (1987). "Anxiety, Hunger, and Eating Behavior." Journal of Abnormal Psychology **96**(3): 264-269.

Hossain, N. and I. Matin (2004). Engaging Elite Support for the Poorest? BRAC's Experience with the Ultra Poor Programme. CFPR/TUP Working Paper Series No. 3. Dhaka and Ottawa, BRAC and Aga Khan Foundation Canada.

Laitinen, J., E. Ek, et al. (2002). "Stress-Related Eating and Drinking Behavior and Body Mass Index and Predictors of This Behavior " Preventive Medicine **Volume 34**(1): 29-39(11).

Lazarus, R. S. and S. Folkman (1984). <u>Stress Appraisal and Coping</u>. New York, Springer Publishing.

MD, L. and M. MD. (1997). "Eating Behavior Following Stress in Women with and without Bulimic Symptoms." <u>Annals of behavioral medicine</u> **19**(2): 132-138.

Naved, R. (2003). A Situation Analysis of Violence Against Women in South Asia. <u>Regional Workshop in Parliamentary Advocacy for the Prevention of Violence Against Women in South Asia</u>. Dhaka, Bangladesh.

Naved, R. T. "A Situational Analysis of Violence Against Women, in Violence Against Women in South Asia."

Pearlin, L. I. (1982). The Social Context of Stress. <u>Handbook of Stress</u>. L. Goldberger and S. Breznitz. New York, Free Press**:** 303-315.

Prakash, V. A. and A. M. Rana (2006). Self-perceived Health of Ultra Poor Women: The Effect of an Inclusive Development Intervention. <u>CFPR/TUP Working Paper Series No. 10</u>. Dhaka and Ottawa, BRAC and Aga Khan Foundation.

Repetti, R. L. and J. Wood (1997). Families Accommodating to Chronic Stress. <u>Coping with Chronic Stress</u>. G. B. H. New York, Plenum Press**:** 191-220.

Rodgers, B. (1991). "Socioeconomic Status, Employment and Neurosis." <u>Social Psychiatry and Psychiatric Epidemiology</u> **26**: 104-111.

Schwartz, N. and F. Strack, Eds. (1999). <u>Reports of subjective well-being: Judgmental processes and their methodological implications. </u>. Well-Being: The foundations of hedonic psychology. New York, Russel Sage.

Serido, J., D. M. Almeida, et al. (2004). "Chronic Stressors and Daily Hassles: Unique and Interactive Relationships with Psychological Distress." <u>Journal of health and Social Behavior</u> **45**(1): 17-33.

Sulaiman, M. and I. Matin (2006). Targeting Effectiveness of CFPR/TUP in Scale-up Environment. <u>CFPR/TUP Working Paper Series No. 8</u>. Dhaka and Ottawa, BRAC and Aga Khan Foundation Canada.

Sulaiman, M., I. Matin, et al. (2006). Microfinance Engagements of the 'Graduated' TUP Members. CFPR/TUP Working Paper Series No. 9, BRAC.

UNICEF (1998). The State of The World's Children 1998, United Nations Children's Fund.

Vozoris, N. T. and V. S. Tarasuk (2003). "Household Food Insufficiency is Associated With Poorer Health." Journal of Nutrition **133**(1): 120-126.

WB (2004). Bangladesh Development Forum Economic Update, World Bank, Poverty Reduction and Economic Management Sector Unit, South Asia Region.

WB (2006). Country Assistance Strategy For The People's Republic Of Bangladesh. Report No. 35193, The World Bank.

Weich, S. and G. Lewis (1998). "Poverty, Unemployment, and Common Mental Disorders: Population-based Cohort Study." British Medical Journal **317**: 115-119.

WFP (2004). Overview: World Hunger, Bangladesh, April 2004, United Nations, World Food Programme.

WHO (2000). "World Report on Violence and Health ".

WHO (2006). Country Health Profile, World Health Organization, Bangladesh HNPSP (PIP).

Yusuf, H. (2004). Baseline report on nutrition and health situation for Bangladesh Food Insecurity and Vulnerability Information and Mapping Systems (FIVIMS) (*Unpublished*). Dhaka, Ministry of Agriculture, Bangladesh.

CHAPTER THREE

BRAC'S POVERTY REDUCTION PROGRAM IMPROVES ECONOMIC STATUS AND SUBJECTIVE WELLBEING, AND REDUCES FOOD INSECURITY, DOMESTIC VIOLENCE AND DISTRESS

INTRODUCTION

Despite efforts made throughout the world to help poor people to gain sustainable economic power through variety of approaches, poverty still remains the key global concern (UN 2007). One of the major causes for this circumstance to prevail is that the conventional programs designed to alleviate poverty often miss the poorest of the poor because of weak targeting mechanism or due to self-exclusion of the potential beneficiaries or both (Morduch and Haley 2001; Matin and Hulme 2003). Challenging the Frontiers of Poverty Reduction-Targeting the Ultra Poor (CFPR-TUP) is a specially designed targeted poverty reduction strategy providing support to the extreme poor in rural Bangladesh through income generating activities (IGA) and strengthening their socio-political livelihood. The program is implemented by Building Resources Across Communities (BRAC), a non-government organization (NGO) in Bangladesh.

A series of working papers published by Research and Evaluation Division, BRAC, supported by other international publications, shows that the program has been highly effective in targeting the extreme poor households and improving their economic status (BRAC-RED 2004; Matin and Halder 2004; Barua and Sulaiman 2006). The program also improved participant's perceived health, nutritional status of women and children under age 5 years, and decreased household food insecurity (Rabbani, Prakash et al. 2006). The program households also increased food and nutrient

consumption and their social capital (Ahmed and Rana 2005; Haseen 2006; Walker and Matin 2006; Haseen 2007).

Apart from these findings, there might be other outcomes that may make important contributions to the lives of the participants. It is also possible that the program has some unintended negative consequences. For example, IGA for women could strengthen women's role in the household, leading to less domestic violence, or could increase conflict leading to more domestic violence (Husain 1988; Schuler, Hashemi et al. 1998). IGA may positively or negatively affect child caring practices (Nerlove 1974; Epps and Huston 2007). Understanding improvement in such outcomes by the program may contribute potentially in judging the cost-benefit and cost-effectiveness of the program, and in garnering support for the expansion of the program. The first objective of this study was to evaluate whether or not BRAC's CFPR-TUP program has an effect on a constellation of outcomes which we assumed that the program could have potentially benefited or possibly had affected negatively. The measures comprise subjective wellbeing of the program participants, domestic violence, distress, child discipline, parental care for early childhood learning, and emotional social constraints. A second objective was to examine whether the benefits of the program were dependent on the participants' initial (i.e., at the beginning of the program) economic or food insecurity status.

DESIGN AND METHOD

The CFPR-TUP program supports women of extreme poor households in rural Bangladesh by providing income earning assets, subsistence allowance, and training on basic entrepreneurial skills. The households are selected using a multistage selection process, based on socio-economic condition and availability of women

eligible of earning income. The program strengthens participant's socio-political livelihood by building awareness and self-confidence as well as by advocating at local level service-oriented institutions (BRAC 2001). After a grant phase of 18 months, the participants are expected to graduate and join the conventional BRAC micro-credit program.

The study was conducted in Nilphamari, Kurigram, and Rangpur, 3 northern districts of Bangladesh where the first phase CFPR-TUP program began in 2002. For the purpose of effective program evaluation, BRAC collected baseline (i.e., 2002) data on a set of variables from one-third (i.e. 446) of randomly selected villages within each of BRAC's 38 Area Offices (AO) in those districts. All program households and an approximately equal number of control households from these villages were included in the baseline survey. Data were also collected in 2006 from households that were surveyed at baseline. Respondents of 2006 survey were recruited from 261 villages, randomly selected from the baseline village list of 446. The distribution of households across districts, Area Offices, and villages are shown in Table 3.1 in the Results section. As in baseline, all program households and an approximately equal number of control households from each village were included in the study. The control households were initially selected by BRAC but were later excluded during the multistage selection process. The non-selected households were therefore better off than the selected group based on the selection criteria. Even after the program's grant phase was over, the program households remained different from the control households in that more than 70% of the women were likely to have participated in the regular BRAC program (Sulaiman, Matin et al. 2006). Owing to this difference between groups, and the availability of baseline data on a number of variables, our

study essentially uses a non-equivalent control group pre- and post-test quasi-experimental design.

Data on household demography, food insecurity, perceived economy, and emotional social constraints were collected from all households in July-September 2006. The demographic variables included age, marital status, education status of respondent and her husband, major source of household income, involvement in income generating activities and respondent's pregnancy status. Subjective wellbeing (SWB), domestic violence, distress, child discipline, and parental role in early childhood learning were also measured concurrently using different set of forms on representative sub-samples. Baseline (i.e., 2002) measures used in this study were number of children, household size, economic status, and food insecurity. Baseline economic status and food insecurity scores were created in a separate dataset and merged to 2006 data.

Sample sizes needed for adequate power were calculated based on mean and standard deviation or prevalence of the outcome variables found in other relevant studies and national data (ref). Power (1-β) of 80% and 90% with α of 0.05 was used to determine the adequacy of sampling for each of the outcomes. Assuming that the program's effect on the outcome variables could be either positive or negative, we assumed two-tailed test to calculate the sample sizes.

Informed consent was obtained from each respondent prior to interviews. The study protocol was approved by Bangladesh Medical Research Council, Dhaka, Bangladesh and University Committee on Human Subjects, Cornell University, USA.

Data collection procedure

In 2006, a total of 24 interviewers collected data in 12 groups using 5 different pre-tested survey forms. The interviewers were selected from a pool of 30 female university graduates who went through the entire phase of training. Training was provided for 5 weeks by a team of 3 field research experts led by the principal investigator. An expert trainer from the International Centre for Diarrhoeal Disease and Research, Bangladesh (ICDDR,B) trained the interviewers on child discipline and parental role in early childhood learning.

The training was designed to have 5 different phases. Two field trainings, 2 days each, were done in between three classroom trainings. This was followed by a day-long refresher training that was given at a field office after the interviewers were sent to test data collection for a day on the actual program households that were not participating in the research.

The training and the data collection was performed in two groups. The first group consisted of 6 sub-groups, each having 2 interviewers. This group was responsible for surveying Form A which included information on demography, perceived economy, food insecurity, and emotional social constraints. The second group consisted of 3 sub-groups. A total of 6 anthropologists were equally assigned to the sub-groups. They were specially trained to survey Form C that was designed to collect data on child discipline and parental role in early childhood learning modules and Form D to collect distress and domestic violence information. Form E contained tools for measuring different components of subjective wellbeing and a single item response measure of participants' global judgment of wellbeing. This form was surveyed by an individual anthropologist.

Interviewers were assigned to area offices randomly. Three field supervisors, each responsible for one district, supervised the interviewers. All field activities were monitored by a Field Manager highly experienced in conducting surveys. The Principal Investigator (PI) and the Field Manager frequently visited several data collection sites everyday to ensure quality of the data. All interviewers were provided with cellular telephones to instantly communicate with the Field Manager and/or PI in case of any problem at the field and also to convey messages if any strategic change would be made.

Data entry and preliminary cleaning was done by a data entry specialist at Research and Evaluation Division of BRAC. Further cleaning was done by the investigators.

Measurement of variables

All instruments had been tested for applicability in rural areas of Bangladesh prior to data collection (WHO 1998). To test for reliability and to validate that the items had well-grounded construction, its performance is consistent with understanding, and measures with precision, dependability, and accuracy, each questionnaire was administered on a sub-sample of 30 program participants (Frongillo 1999). Special attention was given to the forms that included wellbeing, domestic violence, child discipline, and parental role in early childhood learning. A preliminary questionnaire was drafted after making necessary changes. Further inputs were incorporated during training of the interviewers.

<u>Subjective wellbeing</u>

Subjective wellbeing is defined as a broad domain involving a number of separable components such as life satisfaction, satisfaction with important domains of life,

positive affect, i.e., experiencing many pleasant emotions and moods, and low levels of negative affect, i.e., experiencing unpleasant emotions and moods (Diener 2000). Affective component of subjective wellbeing was measured using Positive Affect and Negative Affect Schedule (PANAS) (Watson, Clark et al. 1988). Subjects were asked to rank their status for each item within a range of 5. We reverse coded the 10 Negative Affect (NA) items and added them to 10 Positive Affect (PA) items to make a composite scale ranging from 1 to 100. The PAs and NAs were also used as separate outcome variables to assess the effect of the program on each individual affective component. The Cronbach's alpha coefficient for test of reliability of PANAS was 0.79. When tested separately, the alpha for the positive affect was 0.81. Average factor loading on one factor was 0.62 ranging from 0.43 to 0.77 and the factor explained 40% of the total variability. The alpha coefficient for the negative affect was 0.70 and the average factor loading on one factor was 0.57 ranging from 0.41 to 0.70, explaining 37% of variability.

Satisfaction With Life Scales (SWLS) was used to measure the cognitive component of the subjective wellbeing (Diener, Emmons et al. 1985; Pavot and Diener 1993). The final question out of five items confused the respondents due the high level of abstraction and ended up with double negative responses. This question was later dropped after testing for its reliability and validity. The Cronbach's alpha coefficient for test of reliability for the remaining four SWLS questions was 0.81. This factor explained 64% of the total variability. Factors loading for the items were 0.82, 0.81, 0.79 and 0.79. Before analysis all items were standardized and added to form a final variable representing SWLS.

Subjective wellbeing questionnaire was surveyed by a single well-trained interviewer. This eliminated the possible bias of inter-interviewer variation. At the end of the interview, she discussed for approximately 25 minutes with each respondent about the goals and achievement of satisfaction, resources to pursue goals, individual and society level values and satisfaction with life. Respondents were then asked to rank themselves on a 5-point Likert scale based on the global judgment of their wellbeing. For all measures of wellbeing, a higher value indicated a better wellbeing status.

Before running the statistical models for the measures of different components of subjective wellbeing, we examined how well they measured the outcome, and were correlated to each other. Factor analysis showed that subjective wellbeing explained 66% of the total variability of these measures. Factor loadings for PANAS, SWLS and the single item measure were 0.84, 0.79 and 0.81 respectively. Correlation coefficients between PANAS and SWLS, PANAS and the single item measure, and the single item measure and SWLS were $r=0.50$, $r=0.53$, and $r=0.45$ respectively, all being significant at the 0.001 level (2-tailed).

Child discipline, parental role in early childhood learning:

Multiple Indicator Cluster Survey (MICS) 2005 questionnaire of The United Nations Children's Fund (UNICEF) was used to measure child discipline and parental role in early childhood learning. Based on non-coercive, coercive, and severe abusive responses of mothers to aggressive and non-aggressive child behavior, we grouped the child discipline items as: 1) Coercive response to non-aggressive behavior, 2) Coercive response to aggressive behavior, 3) No coercive response to any kind of child behavior, 4) Coercive response to both aggressive and non-aggressive child behavior, and 5) Severe abusive response to both aggressive and non-aggressive child

behavior. Binary variables were created for each group based on whether or not any of the items had at least one positive response. Because an individual mother could show the same response to different types of child behavior as well as different responses to similar child behaviors, the outcome measures for the responses were not mutually exclusive. At the end of the interview, mothers were asked if they felt it was necessary to physically punish to raise children.

Several questions were asked to measure parental role in stimulating early childhood development. Respondents were asked if any member of the household above age 15 years was engaged in any of 6 specific types of activities stimulating child learning. The activities included reading books, telling stories and singing to the children, playing with them, taking them out and helping them to learn by naming, counting or drawing things. Information was also collected on number of books and materials to play with at home, number of times children left alone at home, and number of times children were left at home with a minor of age 10 years or less.

Economic status:

MICS Manual was also used to create composite economic status scales out of multiple variables that were collected at baseline and in 2005 by Research and Evaluation Division (RED) of BRAC. Variables were used in groups or as single items depending on the type and weight, and availability of data. Standardized values of the items were added to form the group variables. The final variables that constructed the economic status score were social status (2 items), healthy and hygienic practices (3 items), physical condition of household (3 items), non-productive household assets (9 items), productive household assets (9 items), food security (2 items in 2002 and 5 items in 2005), per capita household income, total area

of land owned and access to drinking water. Once prepared, the subscales were also standardized before adding them up to form the final economic status variable.

Perceived economy was measured in 2006 with a single response measure asking the respondents to rate their economic status in the previous year on a 4 point scale that ranges from always deficit to surplus. Higher values of all measures of economic status represented economically better off households.

Food insecurity:

Food insecurity is the limited or uncertain availability of nutritionally adequate and safe foods or limited or uncertain ability to acquire food in a socially acceptable ways (Bickel, Nord et al. 2000). Household food insecurity in 2006 was measured using a standard pre-tested 11-item module developed to measure food insecurity in rural Bangladesh (Frongillo, Rauschenbach et al. 1997; Frongillo, Chowdhury et al. 2003). Responses for each question were standardized and added to form a composite score of household food insecurity. The z-score ranged from -33.20 to 12.90, a higher score indicating more food insecurity. Food insecurity at baseline was measured using two items asking women to rate their food deficit in last one year and whether or not the household could ensure at least two meals a day.

Emotional social constraints:

A three-item tool used to measure emotional social support in rural Burkina Faso was adapted and used in this study (Nanama 2005). Women were asked about the likelihood of having someone to share her unhappy feelings with, getting effective emotional support from someone living closer to her, and the likelihood of getting

advice in crisis. Each item was given a score and then added up to form a variable for emotional social constraints. A higher value represents lower support.

Domestic violence:

Domestic violence against women is defined as any act or omission by a family member, regardless of the physical location where the act takes place, which negatively affects the well being, physical or psychological integrity, freedom or right to full development of a woman (WHO 2000). We measured domestic violence using a 18-item questionnaire under the guideline provided by World Health Organization (Ellsberg and Heise 2005). The questionnaire was used by International Centre for Diarrhoeal Diseases Research, Bangladesh (ICDDR,B) on rural Bangladeshi women (Naved 2003). Information was collected on five different categories of violence: restriction of mobility or socialization or both (5 items), psychological oppression (5 items), moderate physical assault (3 items), severe physical assault (3 items) and sexual abuse (2 items). For each category, respondents were asked whether or not they had experienced certain types of violence within last one year regardless of the person who was responsible for it. All items representing a specific category of violence were added up to make a scale for that category. Summation of all 18 items were also used to make a final scale representing the magnitude of cumulated experience of violence. The Cronbach's alpha reliability coefficient for the scale was 0.87. Similar statistical procedures were followed to construct the variable representing violence during pregnancy. This scale had a Cronbach's alpha reliability coefficient of 0.90. In both measures a higher score indicated experiencing more violence.

Distress: Distress is the cognitive appraisal of stress. We measured distress using World Health Organization (WHO)- Self Reporting Questionnaire (SRQ-20) which

has been previously tested and applied in rural Bangladesh context (Naved and Persson 2005). A scale of 0-20 was used in the analysis where higher score referred to high level of distress.

Control measures

Analyses were controlled for individual and household level covariates measured at baseline and in 2006. Baseline measures used as covariates were number of children, household size, food insecurity, and economic status. Data on age, marital status, respondents' education, husband's education, household main source of income, and involvement in income generating activities were collected in 2006. Age, number of children, household size, measures of food insecurity and economic status were used as continuous variables while rest were used as categorical variables (Tables 3.2 and 3.3). Theoretically, husband's education, IGA and pregnancy status were important control variables for the relevant outcomes. These items had many missing data and when we included in the analysis, they had no influence on the results. These variables were therefore removed from the final analyses.

Statistical analysis

All outcome variables were tested for normality. Household economy scales made out of baseline and 2005 data showed nonnormal distributions. Logarithmic transformations were used to create scales of normal distribution. Transformed scales were used in multilevel analyses. Means and standard deviations were reported on the scales in bivariate analyses. For all continuous variables, effect sizes (ES) were calculated dividing the difference of means between groups by their pooled standard deviation i.e., the root mean square of the two standard deviations.

$$\text{Effect Size (ES)} = \frac{Mean_{Program} - Mean_{Control}}{\sqrt{\left(\sigma_1^2 + \sigma_2^2\right)/2}}$$

Effect sizes are considered small, medium, and large for values 0.2, 0.5, and 0.8 respectively (Cohen 1988; Cohen 1992).

Linear mixed (random-intercept) models were used to account for clustering of districts, Area Offices, and villages in measuring the effect of the program on all outcomes. Area Office and villages were used as random effect variables in the models. District was used as a fixed effect variable. All covariates including baseline food insecurity and economic status were also included as fixed effect variables in the models.

All binary variables of child discipline with response rates between 20-80% were analyzed using linear mixed models (Cox and Snell 1989). Logistic regression was used to analyze the effect of the program on items with response rates <20% or >80%, group 5 and groups 1, 2 and 4 of child discipline respectively.

The following four statistical models were used for each of the outcome variables where FI02, EC02 and PR represent baseline food insecurity, baseline economic status and program, respectively.

$$Y_{iva} = \beta_{0i} + \beta_{1i}\,PR_{iva} + \beta_{2i}\,\text{District} + u_a + u_{v|a} + \varepsilon_{iva} \quad \text{---------------------------------} \quad (1)$$

Y_{iva} refers to the response measures of outcome variables while subscripts i, v and a, denotes individual, village and area levels respectively. The first model accounted only for district, area and individual levels in analyzing the effect of the program on an

outcome. The random effect associated with the intercept for area is represented by u_a, the random effect associated with the intercept for village within area is represented by $u_{v/a}$, and the residual is denoted by ε_{iva}. The second model was created by adding all covariates to the first model. In the initial analyses we controlled for husbands' education and pregnancy status of the respondents for relevant outcome variables. These variables were removed from the final analyses as they had no effect on the overall results and also for the fact that they significantly reduced the sample size. Baseline food insecurity and economic status were used for their lag effects allowing us to use temporality to get a more precise estimation of causal relationships between them and the outcome variables.

$$Y_{iva} = \beta_{0i} + \beta_{1i}\,\text{PR}_{iva} + \beta_{2i}\,\text{District} + \beta_{3i}\,\text{covariates}_{iva} + \beta_{4i}\,\text{EC02}_{iva}$$
$$+ \beta_{5i}\,\text{FI02}_{iva} + u_a + u_{v|a} + \varepsilon_{iva} \text{-------------- (2)}$$

Interactions of food insecurity and economic status with program participation were added in the third and fourth model respectively to estimate the effect of the program based on the respondent's baseline status of the two variables.

$$Y_{iva} = \beta_{0i} + \beta_{1i}\,\text{PR}_{iva} + \beta_{2i}\,\text{District} + \beta_{3i}\,\text{covariates}_{iva} + \beta_{4i}\,\text{FI02}_{iva}$$
$$+ \beta_{5i}\,\text{FI02*PR}_{iva} + u_a + u_{v|a} + \varepsilon_{iva} \text{---- (3)}$$

$$Y_{iva} = \beta_{0i} + \beta_{1i}\,\text{PR}_{iva} + \beta_{2i}\,\text{District} + \beta_{3i}\,\text{covariates}_{iva} + \beta_{4i}\,\text{EC02}_{iva}$$
$$+ \beta_{5i}\,\text{EC02*PR}_{iva} + u_a + u_{v|a} + \varepsilon_{iva} \text{-- (4)}$$

We used the following equations to calculate the "benefit attributable to the program (BAP)" and "proportional benefit attributable to program (PBAP)" to show the

positive effects of CFPR-TUP program on wellbeing, food insecurity, and domestic violence. The percentage of positive responses from each item under a specific category were and added and the average percentage were used in the calculation.

$$BAP = \text{Percent adverse incidence in control} - \text{Percent adverse incidence in program}$$

$$PBAP = \frac{\text{Percent adverse incidence in control} - \text{Percent adverse incidence in program}}{\text{Percent adverse incidence in control}}$$

All analyses were performed using the Statistical Package for Social Sciences (SPSS WIN 15).

RESULTS

Distribution of sample households across districts, Area Offices, and villages are shown in Table 3.1. Household characteristics of the respondents, measured in years 2006 and baseline, are summarized in Tables 3.2 and 3.3 of this section. Between-group comparison of means and standard deviations of control variables are presented in Table 3.2 and the percentage of positive responses of all binary measures are shown in Table 3.3. Data were available for a total of 1618 women in 2006 and 1232 women at baseline. Not all of them were, however, included in the sample for each outcome. Distribution of sub-samples between program and control households are shown in Tables 3.4 and 3.5 with means and standard deviations of the outcome measures.

Table 3.1: Distribution of sample households across districts Area Offices and villages

Districts	Rangpur	Nilphamari	Kurigram	Total
# of Area Offices	15	12	10	37
# of Villages	104	55	102	261
# of Program HH	236	195	236	667
# of Control HH	311	284	414	1009

The majority of women were between 20-45 years with a mean age of 27.83±5.8. Overall mean and SD of all respondent women was 28.04±8.04. Mean number of children living in the households was 0.85±0.75 and total household member was 4.07±1.54. Measures of baseline food insecurity and economic status were used in the analyses as standardized scores explaining the '0.00' value for the means. At baseline the program households were more food insecure as well as worse off economically compared to the control households.

Table 3.2: Household characteristics of the respondents measured in 2006 and at baseline.

	Program		Control		All	
	N	Mean ± SD	*N*	Mean ± SD	*N*	Mean ± SD
Age in 2006						
<20 years	*29*	18.21 ± 0.98	*82*	18.04 ± 0.90	*111*	18.08 ± 0.92
20-45 years	*586*	28.70 ± 6.04	*872*	27.24 ± 5.56	*1458*	27.83 ± 5.80
>45 years	*25*	54.84 ± 7.21	*24*	59.33 ± 8.07	*49*	57.04 ± 7.90
All	*640*	29.25 ± 8.17	*978*	27.26 ± 7.85	*1618*	28.04 ± 8.03
Number of children at baseline	*589*	0.87 ± 0.74	*715*	0.84 ± 0.76	*1304*	0.85 ± 0.75
Household size at baseline	*636*	4.09 ± 1.59	*978*	4.05 ± 1.51	*1614*	4.07 ± 1.54
Food insecurity in at baseline	548	0.48 ± 1.59	684	-0.38 ± 1.64	1232	0.00 ± 1.67
Economic status at baseline	543	-1.49 ± 3.20	689	1.18 ± 5.21	1232	0.00 ± 4.63

Table 3.3 shows that 89.4% of women in the program households were married as compared to 95.9% in the control households. Women participating in the CFPR-TUP program had a lower education rate than women of control households at all levels of education. Only 18% of program women had some level of education as opposed to 27% of women in control households. A similar trend was also observed in the levels of husband's education.

Table 3.3: Household characteristics of the respondents, measured in 2006.

	Program		Control		All	
	N	(%)	*N*	(%)	*N*	(%)
Marital status						
Married	*640*	89.4	*978*	95.90	*1510*	90.1
Divorced/widowed/separated	*68*	10.6	*40*	4.10	*108*	6.4
Total	***708***	**100.0**	***1018***	**100.0**	***1618***	**100.0**
Respondents' education						
No education	*525*	82.0	*711*	72.70	*1236*	76.4
Primary and equivalent	*83*	13.0	*199*	20.30	*282*	17.4
Secondary	*32*	5.0	*67*	6.90	*99*	6.1
Higher secondary	*0*	0.0	*1*	0.10	*1*	0.1
Total	***640***	**100.0**	***978***	**100**	***1618***	**100.0**
Husband's education						
No education	*518*	86.0	*756*	79.20	*1274*	81.9
Primary and equivalent	*64*	10.6	*140*	14.70	*204*	13.1
Secondary	*20*	3.3	*56*	5.90	*76*	4.9
Higher secondary	*0*	0.0	*2*	0.20	*2*	.1
Total	***602***	**100.0**	***954***	**100.0**	***1556***	**100.0**
Major source of HH income						
Manual labor (agri/non-agri)	*448*	70.0	*676*	69.10	*494*	30.5
Business/services & others	*192*	30.0	*302*	30.90	*1124*	69.5
Total	***640***	**100.0**	***978***	**100.0**	***1618***	**100.0**
Respondent's involvement in IGA *	*182*	69.2	*152*	50.0	*334*	60.5

*Data limited to outcomes and subjective wellbeing

More than two thirds (70%) of both program and control households lived mainly on agricultural or non-agricultural types manual labor. Information on income generating activities was available only from households that were surveyed for perceived physical health. Women of program households were more involved in IGA in 2006 than were women of control households.

Table 3.4 summarizes and compares the means and standard deviations of the outcome measures between program and control households. In addition, the last column of the table shows the effect sizes for each outcome. The program households were better off compared to the control households in measures of subjective wellbeing, economic status in 2005, perceived economy, food insecurity, domestic violence, and distress. No difference was observed between groups of households in measures of emotional social constraints, however. All measures of subjective wellbeing, except sum of positive affect (ES=0.62) showed large effect sizes (ES) ranging between 1.02 to 1.31. Medium effects were seen with economic status in 2005 (ES=0.60), perceived economy (ES=0.42), and food insecurity (ES=0.53).

In general, the program had smaller effects on domestic violence with effect sizes ranging between 0.25 to 0.31, except severe physical assault (ES=0.06). Effect of the program on violence during pregnancy (ES=0.16) and distress (ES=0.12) was very small.

Table 3.4: Comparison of measures of outcome variables between program and control households (shown as means and standard deviations)

Outcome variables	Program		Control		ALL		Effect size
	N	Mean±SD	N	Mean±SD	N	mean±SD	
Subjective wellbeing							
Positive & Negative Affect	110	65.73 ± 11.16	99	55.53 ± 7.54	209	60.90 ± 10.87	1.07
Sum of Positive Affect	110	30.48 ± 7.79	99	23.68 ± 5.22	209	27.26 ± 7.50	1.02
Sum of Negative Affect	110	24.76 ± 5.78	99	28.15 ± 5.16	209	26.36 ± 5.73	0.62
Satisfaction With Life Scales	110	1.66 ± 3.07	99	-1.84 ± 2.19	209	0.00 ± 3.21	1.31
Single response measure	110	2.46 ± 0.83	99	1.54 ± 0.72	209	2.02 ± 0.91	1.18
Economic status							
Measured economy in 2005	529	2.33 ± 4.67	669	-0.96 ± 6.17	1198	0.49 ± 5.79	0.60
Perceived economy in 2006	640	2.16 ± 0.84	978	1.82 ± 0.78	1618	1.95 ± 0.82	0.42
Food insecurity in 2006	638	-2.85 ± 7.58	978	0.85 ± 6.43	1616	-0.62 ± 7.14	0.53
Emotional social constraints	635	5.56 ± 1.65	978	5.64 ± 1.63	1613	5.61 ±1.64	0.05
Domestic violence							
Restricted movement	560	1.45 ± 1.59	767	1.98 ± 1.73	1327	1.75 ± 1.69	0.31
Psychological oppression	560	2.95 ± 1.69	767	3.36 ± 1.64	1327	3.19 ± 1.67	0.25
Physical assault (moderate)	560	1.40 ± 1.32	767	1.76 ± 1.30	1327	1.61 ± 1.32	0.28
Physical assault (severe)	560	0.35 ± 0.72	767	0.40 ± 0.75	1327	0.38 ± 0.73	0.06
*Sexual abuse (%)	560	73.4	767	83.8	1327	79.4	--
All forms of domestic violence	560	6.39 ± 4.38	767	7.75 ± 4.39	1327	7.17 ± 4.44	0.31
Violence during pregnancy	560	5.42 ± 4.53	767	6.14 ± 4.72	1327	5.84 ± 4.65	0.16
Distress	560	13.82 ± 4.11	767	13.32 ± 4.48	1327	13.61 ± 4.28	0.12
Child discipline & parental role in early childhood learning							
Activities stimulating child development	256	2.94 ± 1.79	220	3.07 ± 1.75	476	3.00 ± 1.78	0.07
Number of books	256	3.75 ± 5.12	220	3.23 ± 4.75	476	3.51 ± 4.96	0.11
Number of material to play with	256	5.54 ± 2.14	220	5.38 ± 2.24	476	5.47 ± 2.18	0.07
Number of times children left alone at home	256	1.16 ± 2.32	220	0.86 ± 1.90	476	1.02 ± 2.14	0.14
Number of times children left with a minor	253	2.64 ± 3.48	218	2.15 ± 3.35	471	2.41 ± 3.24	0.14

*single item with a binary response

Households sporadically differed between groups in the measures of child discipline and parental role in early childhood learning as shown at the bottom of Table 3.4 and in Table 3.5. The effect sizes were also negligible (<0.20). Overall, no specific trend was observed across the two groups of households. There was essentially no difference between groups in the mean number of activities stimulating child development. Mean and standard deviation for the entire sample was 3.00 ± 1.78 on a scale of 0-6. On average, households had 3.51 ± 4.96 books and 5.47 ± 2.18 materials that the child can play with and showed no observable difference between groups. Women reported to have left children unattended at home for 10 or more minutes in 7 days was 1.02 ± 2.14 times. In 2.41 ± 3.24 cases they had left children with under the care of a minor of 10 years or less.

Table 3.5 shows that almost all mothers in both groups showed coercive response to both aggressive and non-aggressive child behaviors. Approximately 83% mothers from program households and 76% mothers from control households showed non-coercive responses to both kinds of child behaviors. Relatively few mothers reported to have severe abusive response to either kind of child behavior. The program households, however, showed a slightly higher response (9%) compared to the control households (6%).

Table 3.5: Comparison of measures of child discipline and parental role in early childhood learning between program and control households (shown in percentages)

	Program		Control		All	
	N	% (number)	N	% (number)	N	% (number)
Child discipline & parental role in early childhood learning						
Coercive response to non-aggressive behavior	256	99.6% (255)	220	98.2% (216)	476	98.9% (471)
Coercive response to aggressive behavior	256	99.2% (254)	220	98.6% (217)	476	98.9% (471)
Non-coercive response to any kind of child behavior	256	83.2% (213)	220	75.9% (167)	476	79.8% (380)
Coercive response to both kinds of behavior	256	97.3% (249)	220	96.8% (213)	476	97.1% (462)
Severe abusive response to Any kind of child behavior	256	9.4% (24)	220	5.9% (13)	476	7.8% (37)
Necessity to physically punish children	256	58.2% (149)	220	58.6% (129)	476	58.4% (278)
Role of father in child care	256	16.8% (43)	220	23.2% (51)	476	19.7% (94)

The following series of tables show the effect of the program on different outcomes. Each table shows the four models used in the analyses. Model 1 is the uncontrolled model while the other three models control for variables as listed at the bottom of each table. The estimates in Model 1 and Model 2 denote the regression coefficient for program vs. control while estimates in Model 3 and Model 4 denotes the regression coefficient for the interaction term. The regression coefficients and the *p*-values denoting their level of significance are shown in pairs for each model. Sample sizes achieved for each outcome are also shown for individual models. There is a general trend of gradual reduction in the number of respondents across models for each outcome as the covariates and later the interactions were added to the models.

The program significantly improved participants' wellbeing for all of its measures (Table 3.6). The uncontrolled estimate of the effect of the program on wellbeing measured by PANAS was 9.76. Considering the standard deviation of ±10.87 for the overall measure of this scale, this was a large effect with a high level of significance ($p<0.001$). When controlled for all covariates the magnitude of the effect increased to 10.78, which is approximately one standard deviation of the measure. The effect size, calculated as the difference in means divided by the standard deviation of PANAS was 1.07 (Table 3.4). When analyzed separately, estimates of Positive Affect and Negative Affect also showed similar trends. The effect sizes for PAs and NAs were 1.02 and 0.62 respectively. Estimates of NA showed negative values as the original codes were used unlike the reversed codes used in PANAS. A negative estimate, however, showed that the program reduced the negative affect of life.

The other measures of subjective wellbeing also showed positive effects of the program on the participants. The uncontrolled and controlled estimates were 3.41 and 3.33 respectively. The magnitude of the effect was large and significant with an effect size of 1.31 although the magnitude of the estimate for Satisfaction With Life Scale (SWLS) varied greatly with that of PANAS, given that we used standardized scores for this measure and that the mean and SD are 0.00 ± 3.21. Similarly, the single response measure of subjective wellbeing showed a large effect size of 1.18 (Table 3.4).

Table 3.6: Models showing effect of the CFPR-TUP program on measures of subjective wellbeing

	Model 1 Base model with district as fixed effect[1]		Model 2 Model 1 plus All covariates[1,3]		Model 3 Model 2 plus interaction of baseline food insecurity[2,3]		Model 4 Model 2 plus interaction of baseline economic status[2,3]	
	β	p-value	β	p-value	β	p-value	β	p-value
Subjective wellbeing	N= 209		N= 205		N= 170		N = 169	
Positive & Negative Affect	9.76	0.00	10.78	0.00	-0.07	0.94	-0.64	0.92
Sum of Positive Affect	5.86	0.00	6.09	0.00	0.15	0.80	-1.36	0.76
Sum of Negative Affect	-3.69	0.00	-4.73	0.00	0.23	0.65	-1.31	0.74
Satisfaction With Life Scales	3.41	0.00	3.33	0.00	0.30	0.24	-1.23	0.53
Single response measure	0.91	0.00	1.01	0.00	0.11	0.11	-0.92	0.08

[1]The estimates are the regression coefficient for program vs. control
[2] The estimates are the regression coefficient for the interaction term.
[3]Controlled for age, marital status, number of children, household size, respondents' education, husband's education, household main source of income, economic and food insecurity status at baseline.

Estimates and their level of significance for both uncontrolled and controlled measures of outcomes related to child discipline showed that the program had no effect on any of the measures (Table 3.7). We found no effect of the program on parental role in early childhood learning, in terms of engaging in activities that stimulate development, number of books and playing materials available at home, and the number of times leaving children alone or with a minor at home.

Table 3.7: Models showing effect of CFPR-TUP program on child discipline and parental role in early childhood learning

	Model 1 Base model with district as fixed effect[1]		Model 2 Model 1 plus all covariates[1,3]		Model 3 Model 2 plus interaction of baseline food insecurity[2,3]		Model 4 Model 2 plus interaction of baseline economic status[2,3]	
	B	p-value	β	p-value	β	p-value	β	p-value
Child discipline & parental role in early childhood learning	*N = 476*		*N = 460*		*N = 370*		*N = 371*	
Coercive response to non-aggressive behavior	0.01	0.13	0.02	0.19	-0.01	0.46	-0.05	0.39
Coercive response to aggressive behavior	0.01	0.56	0.00	0.71	-0.01	0.24	0.04	0.48
Non-coercive response to any kind of behavior	0.03	0.35	0.01	0.85	-0.05	0.02	0.16	0.44
Coercive response to both kinds of behavior	0.00	0.91	-0.00	0.89	-0.01	0.31	-0.04	0.59
Severe abusive response to any kind of behavior	0.02	0.42	0.01	0.80	-0.00	0.92	-0.04	0.79
Necessity to physically punish children	-0.03	0.54	0.21	0.39	0.02	0.61	0.24	0.14
Role of father in child care	-0.05	0.24	-0.03	0.56	-0.00	0.86	-0.27	0.22
Number of books available	0.27	0.55	-0.12	0.81	0.16	0.56	-3.66	0.14
Number of materials to play with	0.09	0.68	0.16	0.51	-0.04	0.79	-0.14	0.91
Number of time children left alone at home	0.13	0.53	0.24	0.31	-0.09	0.49	0.30	0.78
Number of time children left with minor	0.20	0.55	0.28	0.47	-0.16	0.45	3.15	0.09
Activities stimulating child development	-0.10	0.53	-0.09	0.67	-0.01	0.89	-0.51	0.58

[1]The estimates are the regression coefficient for program vs. control
[2] The estimates are the regression coefficient for the interaction term.
[3]Controlled for age, marital status, number of children, household size, respondents' education and husband's education, household main source of income, economic and food insecurity status at baseline.

The estimates of economic status in 2005 for both uncontrolled (3.30, $p<0.001$) and controlled (0.14, $p<0.001$) models showed that three years of operation the CFPR-TUP program significantly improved the economic status of the participating households (Table 3.8). The effect size based on mean and SD of this measure was 0.60. Although the magnitude decreased when controlled for all covariates, the effect of the program persisted to be highly significant ($p<0.001$). Estimates of perceived economy also showed similar trend with a medium effect size of 0.42 (Table 3.4).

Table 3.8: Models showing effect of CFPR-TUP program on multiple outcomes

	Model 1 Base model with district as fixed effect[1]		Model 2 Model 1 plus all covariates[1,3]		Model 3 Model 2 plus interaction of baseline food insecurity[2,3]		Model 4 Model 2 plus interaction of baseline economic status[2,3]	
	β	p-value	β	p-value	β	p-value	B	p-value
	N= 1198		N= 1192		N= 1173		N= 1177	
Economic status 2005	3.30	0.00	0.14	0.00	0.36	0.06	-0.22	0.00
	N= 1618		N= 1614		N= 1225		N= 1226	
Perceived economy 2006	0.35	0.00	0.42	0.00	-0.00	0.88	0.02	0.95
Food insecurity	-3.60	0.00	-3.79	0.00	-0.36	0.11	1.91	0.30
Emotional social constraints	-0.08	0.33	-0.13	0.18	-0.08	0.16	0.03	0.95

[1]The estimates are the regression coefficient for program vs. control
[2] The estimates are the regression coefficient for the interaction term.
[3]Controlled for age, marital status, number of children, household size, respondents' education and husband's education, household main source of income, economic and food insecurity status at baseline.

The CFPR-TUP program significantly reduced household food insecurity in 2006 as shown by the estimates and p-values of both controlled (-3.60, $p<0.001$) and uncontrolled (-3.79, $p<0.001$) models in Table 3.8. The effect size for this outcome was 0.53 (Table 3.4).

The program's effect on emotional and social constraints of the participants showed no significance., Program participant women were more likely, however, to get someone to share their feelings (81.7% vs 73.5%) with as compared to the women of the control households.

Women who experienced categories of violence such as restricted mobility, psychological oppression, physical assault, and sexual abuse were 66%, 92%, 66% and 38% respectively. Women experiencing same categories of violence during

pregnancy, estimates of which are not shown in Table 3.9, were 63%, 63%, 57%, and 67% respectively.

In general, the estimates and p-values for both controlled and uncontrolled models show that being in the program reduced the chance of experiencing domestic violence. The effect of the program on severe physical assault, however, shows no significance (-0.05, p=0.24 and -0.02, p=0.69).

Table 3.9: Models showing effect of CFPR-TUP program participation on domestic violence

	Model 1 Base model with district as fixed effect[1]		Model 2 Model 1 plus all covariates[1,3]		Model 3 Model 2 plus interaction of baseline food insecurity[2,3]		Model 4 Model 2 plus interaction of baseline economic status[2,3]	
	B	p-value	β	p-value	β	p-value	B	p-value
Domestic violence	N= 1327		N= 1269		N= 1062		N= 1034	
Restricted mobility	-0.43	0.00	-0.37	0.00	-0.05	0.40	0.08	0.85
Psychological oppression	-0.33	0.00	-0.21	0.03	0.03	0.57	-0.31	0.50
Moderate physical assault	-0.29	0.00	-0.21	0.01	0.07	0.13	-0.08	0.83
Severe physical assault	-0.05	0.24	-0.02	0.69	0.03	0.36	0.15	0.50
Sexual abuse	-0.09	0.00	-0.06	0.02	-0.02	0.29	0.03	0.83
All forms of domestic violence	-1.11	0.00	-0.81	0.00	0.09	0.54	-0.34	0.78
Violence during pregnancy	-0.44	0.03	-0.25	0.30	-0.26	0.27	-0.02	0.98
Distress	-0.40	0.06	-0.18	0.49	-0.29	0.05	2.10	0.08

[1]The estimates are the regression coefficient for program vs. control
[2] The estimates are the regression coefficient for the interaction term.
[3]Controlled for age, marital status, number of children, household size, respondents' education, husband's education, household main source of income, economic and food insecurity status at baseline.

We did similar analysis with violence against women during pregnancy. None of the estimates except uncontrolled model estimating restricted movement, was significant.

We, therefore, presented only the overall measure of domestic violence during pregnancy in Table 3.9, which also was found significant only in the uncontrolled model.

The uncontrolled model showed that the effect of the program on distress was marginally significant (-0.40, $p=0.06$). The effect, however, disappeared as control variables were added to the model (-0.18, $p=0.49$).

No significant interactions of program and baseline food insecurity, and program and baseline economic status, were observed in any of the measures of subjective wellbeing (Table 3.6). Similarly, although the interaction of baseline food insecurity and program on "non-coercive response to any kind child behavior" is significant ($p=0.02$), other measures of child discipline and parental role in early childhood learning do not show similar trend (Table 3.7). This, in general, means that the effects of the program on wellbeing of participants and child related outcomes were independent of their baseline food insecurity or economic status.

Models 3 and 4 of economic status in 2005 show a marginally significant positive estimate of interaction of program and baseline food insecurity (0.36, $p=0.06$), and a highly significant negative estimate of interaction (-0.22, $p<0.001$) of program and baseline economic status (Table 3.8). The directionality of the estimates and their level of significance indicate that households that were food insecure at baseline economically benefited most from the program while the households which were economically better off at baseline benefited least. None of the interactions of perceived economy measured in 2006, was found significant.

None of the food insecurity models shows significant interaction. The direction of estimates, however, indicate that being more food insecure at baseline improved the chance of improving food security after 4 years (Table 3.8)., Being economically better off at baseline decreased the chance of improving food security.

With the exception of the first category of domestic violence (i.e., restricted mobility), the direction of the estimate of interaction (i.e., positive) between program and food insecurity at baseline indicates that households that were food insecure at baseline were more exposed to domestic violence (Table 3.9). Conversely, again with the exception of the first measure, the direction of the estimate of interaction (i.e., negative) between baseline economy and program indicates that households that were economically better off at baseline and participated in the program had experienced less domestic violence. The results of the interaction models explain that the influence of CFPR-TUP program on the occurrence of domestic violence does not depend on their initial (i.e., baseline) food insecurity or economic status.

The models of distress show a significant interaction of program and baseline food insecurity (-0.29, $p=0.05$) and a marginally significant interaction of program and baseline economic status (2.10, $p=0.08$). The directions of the estimates indicate that the women who participated in the program and lived in households that were food insecure at baseline were less distressed in 2006. On the other hand, women who lived in households that were economically better off at the beginning of the program were more distressed in 2006.

The results shown so far indicated that women who participated in the program had fewer experiences of adverse effects of deprivation in their lives, i.e., poor wellbeing, food insecurity, and domestic violence. We used "benefit attributable to the program"

to show the extent to which the program affected the lives of the participants (Table 3.10). The program averted women's experience of negative affect of life by 33.5% and dissatisfaction with life by 42.5%. An average of 14% difference between program and control households in food insecurity items indicates that the participant women had fewer experience of lacking two fulfilling meals in a day, having to eat rice without anything, or borrowing rice from someone. The program women encountered fewer incidences of domestic violence than did the control women (i.e., 12% or less). The proportion of these benefits attributable to the program were more that one-third (0.34-0.44%) for poor wellbeing, approximate one-fifth for food insecurity (0.16-0.18) and ranging from 0.12 to 0.23 for domestic violence.

Table 3.10: Benefits and proportional benefits attributable to program.

Outcome variables	Control (%) A	Program (%) B	Benefit attributable to program (%) A-B	Proportional benefit attributable to the program (A-B)/A
Subjective wellbeing				
Experiencing negative affect of life*	98.0	64.5	33.5	0.34
Dissatisfaction with life	97.0	54.5	42.5	0.44
Food insecurity				
Could not eat two fulfilling meals in a day	75.1	61.3	13.8	0.18
Ate rice without anything	84.8	71.3	13.5	0.16
Had to borrow rice	80.5	66.5	14.0	0.17
Domestic violence*				
Restricted movement	45.7	35.3	10.3	0.23
Psychological oppression	47.8	41.2	6.6	0.14
Moderate physical assault	58.7	46.5	12.2	0.21
Severe physical assault	13.1	11.7	1.5	0.12
Sexual abuse/harassment	83.8	73.4	10.4	0.12

*Questions refers to the previous year
**Questions refer to the previous month

DISCUSSION

The purpose of this study was to provide information about possible beneficial outcomes of efforts to target those who otherwise would have been missed by usual poverty alleviation program. We found that the CFPR-TUP program improved measured and perceived economy, and subjective wellbeing of the participants, and decreased household food insecurity, incidents of domestic violence and distress. No effect of the program, however, was found on emotional social constraints of participating women, child discipline and parental role in early childhood development.

This study is the first to evaluate CFPR-TUP program using linear mixed (random-intercept) models accounting for the district, Area Office and village level variations. The results of the analyses were further validated by comparing them with effect sizes calculated from the raw means and standard deviations of the outcome variables. An effect size helps to determine whether a statistically significant difference is a difference of practical concern (Cohen 1988), and is useful for comparing the relative magnitudes of effects of measures that are on different scales. For each outcome, after controlling for covariates, we further investigated if those effects of the program were dependent upon certain characteristics of the families in which we should have been interested. Although we were limited by the availability of baseline data, using two very important measures of baseline (i.e., economic status and food insecurity) in the interaction models allowed us to examine whether or not worse-off families benefited more from the program. On one hand, it can be argued that the worse-off families should benefit most because they could gain most from the program. On the other hand, the whole reason for the ultra-poor program to emerge was because the very poorest people did not benefit from the conventional programs; therefore, the worse-

off people could have benefited the least. Although in general the interactions were not significant, the direction of estimates in the models show a trend that households that were worse-off economically and more food insecure at baseline were the most benefited ones. In other words, our findings suggests that the CFPR-TUP program has been successful in extending the range of BRAC's services deeper into the poverty pit and benefited those who were at the bottom. This finding contributes further to the studies examining the targeting effectiveness of the program.

Absence of randomization due to practical and ethical reasons, keeps us from making a probability argument in favor of our findings (Habicht, Victora et al. 1999). Having baseline measure of economic status and food insecurity, using an appropriate analytic procedure, and having a control group known to be better off then the program group makes the causal interpretation of these results highly plausible.

This study supports findings from other research showing a positive association between income and subjective wellbeing among the poorest (Douthitt, MacDonald et al. 1992; Diener, Sandvik et al. 1993; Diener and Diener 1995a; Diener and Biswas-Diener 2002). Unlike the middle and higher income groups who aspire for materialistic goals, the participants of CFPR-TUP live in the lowest percentile of socio-economic status and were yet to meet their basic needs. A small change in their income, therefore, improved their livelihood considerably and increased subjective wellbeing scores. It was therefore realistic for us to assume and take into consideration at the beginning of the survey that the wellbeing response could overestimate the actual benefit that the participants had gained from the program. On the other hand, the program households were likely to have shown an inclination towards over-reporting of their wellbeing status due to social desirability. Use of multiple measures

of SWB which showed significant correlations among tools and the strong loading of measures in the factor analysis, however, increased the robustness of our findings and mitigated potential social desirability bias. Previous study on BRAC conventional program showed that micro-credit did little to improve emotional wellbeing of the participants as measured by the absence of stress (Ahmed, Chowdhury et al. 2001). To our knowledge no previous study has evaluated the affective, cognitive, global, and economic components of subjective wellbeing together. This adds further to the novelty of our study.

Based on the strong correlations between economic status and SWB in the poorest percentiles shown in other studies and the association found in our study (r=0.34, p<0.001), it could be argued that the program households were worse off in SWB at baseline compared to the control households (Douthitt, MacDonald et al. 1992; Diener and Diener 1995a). Therefore, it is plausible to say that the change in their status was due to the participation in the program.

We found that, in general, the extreme poor households had a low stimulatory environment for child development. No difference was observed between program and control households in measures of child discipline and parental role in child development. It cannot be ruled out, however, that there could be an initial difference between groups and that the program had leveled them. There is limited information about child discipline in Bangladesh and no study has been done so far on the ultra-poor households. Finding of this study, therefore, also provides a clear picture of the child discipline and parental care situation in the ultra poor households that can be compared to UNICEF global databases-2007 on violence against children (UNICEF 2007). Almost all mothers of our study (97.1%) showed coercive response to child

behavior irrespective of aggressiveness compared to 86% children experiencing violent discipline at home. Severe abusive response rate of 8% can be compared with 19% of children getting "severe physical punishment" in other countries surveyed by UNICEF. Both studies show that the percentage of mothers (42% and 28%) who believe corporal punishment is far less than their usual practice (97% and 62%). Although the difference was not significant, the program households left children alone or with minors at home more than did the control household. One possible explanation could be that the IGA-related activities took time away from mothers that they could possibly have spent with their children.

Previous studies showed that the conventional micro-credit programs as well as the CFPR-TUP program were significantly associated with increased economic wellbeing of the participants (Husain 1988; Ameen and Sulaiman 2006). Our findings support the results of those studies using a different analytical approach to assess the impact of the program on measured and perceived economic wellbeing of the participants.

A study on CFPR-TUP program in 2005 showed that more than a year after graduating from the program, participant household showed better food security status than the control households (Rabbani, Prakash et al. 2006). We further found that the program households sustained that food security status in 2006, two years after graduation from the program. The most likely mechanism to achieve this could be twofold. First is the increased ability of the household to purchase food due to the global effect of the program on income. Second is the likelihood of increased access to the local financial markets as part of the income generating process (Zeller, Schrieder et al. 1997).

The program decreased violence against women to a significant level in all measures except sexual abuse. We found a high percentage of positive responses from women similar to what was found in other studies done in Bangladesh (Salam, Alim et al. 2006). The response rate was highest for psychological oppression (92%) and lowest for sexual abuse (32%). None of the interaction effects were significant. We found no effect of the program on violence during pregnancy although 83% reported experiencing some form of violence. Sexual violence during pregnancy (67%) was caused by the husbands in all reported cases.

Relationship of women's empowerment through micro-credit and experience of violence has been long debated (Rahman 1999; Kabeer 2001; Schulz, Israel et al. 2006). Earlier studies showed that participation in conventional BRAC micro-credit program was associated with increased spousal violence at the initial stage followed by a reduction over years as women become more experienced with synchronizing between income generating activities and family dynamics (Husain 1988; Schuler, Hashemi et al. 1998; Ahmed 2005). In addition to gaining more control over her income, women who participated in the CFPR-TUP program had access to wider range of social and legal supports which may have played a major role in reducing violence. Unlike wellbeing, argument cannot be made about level of domestic violence at baseline as we did not find any correlation with economic status. The programs' effect on distress was more pronounced on women who lived in poorer households with more food insecurity.

A study done in 2005, one year after the 'grant phase' of the CFPR-TUP program was over, showed that 49% of the participants had already joined conventional BRAC micro-credit activities, while 28% had either applied or shown interest. All

participants, however, continued their regular savings with the program (Sulaiman, Matin et al. 2006). Our study found that 2 years after the "grant phase" is over, the participants sustained to enjoy the beneficial effects of the program.

This study provides further evidence that efforts to target and benefit the poorest can be very successful, if implemented well. When these efforts are made, the benefits will not be manifested solely in economic term but in other human terms also. Therefore judgments about cost and benefit of this program need to take these benefits into account. This should also add to our motivation to support and invest on this kind of programs in developing countries because the benefits are beyond simply economic terms. There are also implications of this research for evaluation design. Given that the outcomes of this study were important in human terms they should be evaluated routinely. The program evaluation designs can be enhanced further if these variables are measured at baseline as well as in follow-up.

REFERENCES

Ahmed, S. M. (2005). "Intimate Partner Violence against Women: Experiences from a Woman Focused Development Program in Matlab." Journal of Health, Population and Nutrition **23**(1): 95-101.

Ahmed, S. M., M. Chowdhury, et al. (2001). "Micro-credit and Emotional Well-Being: Experience of Poor Rural Women from Matlab, Bangladesh." World Development **29**(11): 1957-1966.

Ahmed, S. M. and A. M. Rana (2005). Customized Development Interventions for the Ultra Poor: Preliminary Change Assessments of Health and Health-seeking Behaviour (CFPR/TUP 2002 to 2004). CFPR/TUP Working Paper Series No. 7. Dhaka and Ottawa, BRAC and Aga Khan Foundation.

Ameen, F. and M. Sulaiman (2006). Social Capital and Economic Well-being. CFPR/TUP Working Paper Series No. 15. Dhaka and Ottawa, BRAC and Aga Khan Foundation Canada.

Barua, P. and M. Sulaiman (2006). Targeting the Poorest in Microfinance: Poverty Outreach of BDP Ultra Poor Programme. CFPR/TUP Working Paper Series No. 13. Dhaka and Ottawa, BRAC and Aga Khan Foundation Canada.

Bickel, G., M. Nord, et al. (2000). Guide to Measuring Household Food Security: Revised 2000. No. 6. March 2000, U.S. Department of Agriculture, Food and Nutrition Service, Alexandria VA.

BRAC-RED (2004). Stories of Targeting: Process Documentation of Selecting the Ultra Poor for CFPR/TUP Programme. CFPR/TUP Working Paper Series No. 1. Dhaka and Ottawa, BRAC and Aga Khan Foundation Canada.

BRAC (2001). Overview Proposal: Challenging the Frontiers of Poverty Reduction: Targeting the Ultra Poor- Targeting Social Constraints, BRAC, Research and Evaluation Division.

Cohen, J. (1988). Statistical power analysis for the behavioral sciences. Hillsdale, NJ Lawrence Earlbaum Associates.

Cohen, J. (1992). "A Power Primer." Psychological Bulletin **112**(1): 155-159.

Cox, D. R. and E. J. Snell (1989). Analysis of Binary Data. London & New York, Methuen & Co. Ltd. and Chapman and Hall.

Diener, E. (2000). "Subjective Well-Being: The Science of Happiness and a Proposal for National Index." The American Psychologist **55**(1): 34-43.

Diener, E. and R. Biswas-Diener (2002). "Will money increase subjective well-being?" Social Indicators Research **57**(2): 119.

Diener, E. and C. Diener (1995a). "The Wealth of Nations Revisited: Income and Quality of Life." Social Indicators Research **36**: 653-663.

Diener, E., R. A. Emmons, et al. (1985). "The Satisfaction With Life Scale." Journal of Personality Assessment **49**(1).

Diener, E., E. Sandvik, et al. (1993). "The Relationship Between Income and Subjective Wellbeing: Relative or Absolute?" Social Indicators Research **28**: 195-223.

Douthitt, R. A., M. MacDonald, et al. (1992). "The Relationship Between Measures of Subjective Wellbeing and Economic Wellbeing: A New Look." Social Indicators Research **26**: 407-422.

Ellsberg, M. and L. Heise (2005). Researching Violence Against Women: A Practical Guide for Researchers and Activists Washington DC, United States, World Health Organization, PATH.

Epps, S. R. and A. C. Huston (2007). "Effects of a Poverty Intervention Policy Demonstration on Parenting and Child Behavior: A Test of the Direction of Effectsn." Social Science Quarterly **88**(2): 344-365.

Frongillo, E. A. (1999). "Validation of Measures of Food Insecurity and Hunger." The Journal of Nutrition **129**(2): S506.

Frongillo, E. A., N. Chowdhury, et al. (2003). "Understanding the Experience of Household Food Insecurity in Rural Bangladesh Leads to a Measure Different from That Used in Other Countries." Journal of Nutrition **133**(12): 4158-4162.

Frongillo, E. A., B. S. Rauschenbach, et al. (1997). "Questionnaire-Based Measures Are Valid for the Identification of Rural Households with Hunger and Food Insecurity." Journal of Nutrition **127**(5): 699–705.

Habicht, J., C. Victora, et al. (1999). "Evaluation designs for adequacy, plausibility and probability of public health programme performance and impact." International Journal of Epidemiology **28**(1): 10-18.

Haseen, F. (2006). Change in Food and Nutrient Consumption Among the Ultra Poor: Is the CFPR/TUP Programme Making a Difference? Working Paper No.11. Dhaka and Ottawa, BRAC and Aga Khan Foundation Canada.

Haseen, F. (2007). "Change in food and energy consumption among the ultra poor: is the poverty reduction programme making a difference?" Asia Pacific Journal of Clinical Nutrition **16**(Suppl 1): 58-64.

Husain, A. M. (1988). Poverty alleviation and empowerment: The Second Impact Assessment Study of BRAC's Rural Development Programme. Poverty Alleviation and Empowerment. A. Husain. Dhaka, BRAC.

Kabeer, N. (2001). "Conflicts Over Credit: Re-evaluating the Empowerment Potential of Loans to Women in Rural Bangladesh." World Development **29**(1): 63-84.

Matin, I. and S. R. Halder (2004). Combining Methodologies for Better Targeting of the Extreme Poor: Lessons from BRAC's CFPR/TUP Programme. Working Paper No. 2. Dhaka and Ottawa, BRAC and Aga Khan Foundation Canada.

Matin, I. and D. Hulme (2003). "Programs for the Poorest: Learning from the IGVGD Programme in Bangladesh." World Development **31**(3): 647–65.

Morduch, J. and B. Haley (2001). Analysis of the Effects of Microfinance on Poverty Reduction. NYU Wagner Working Paper. No. 1014, New York University.

Nanama, S. (2005). Experience, Trends, and Consequences of Food Insecurity in Complex Households in Rural Burkina Faso. Division of Nutritional Sciences. Ithaca, Cornell Univeristy. **PhD:** 136.

Naved, R. (2003). A Situation Analysis of Violence Against Women in South Asia. Regional Workshop in Parliamentary Advocacy for the Prevention of Violence Against Women in South Asia. Dhaka, Bangladesh.

Naved, R. T. and L. Å. Persson (2005). "Factors Associated with Spousal Physical Violence Against Women in Bangladesh." Studies in Family Planning **36**(4): 289-300.

Nerlove, S. B. (1974). "Women's Workload and Infant Feeding Practices: A Relationship with Demographic Implications." Ethnology **13**(2): 207-214.

Pavot, W. and E. Diener (1993). "Review of the Satisfaction With Life Scale." Psychological Assessment **5**(2): 164-172.

Pollock, J. I., S. Manaseki-Holland, et al. (2006). "Detection of depression in women of child-bearing age in non-western cultures: A comparison of the Edinburgh Postnatal Depression Scale and the Self-Reporting Questionnaire-20 in Mongolia." Journal of Affective Disorders **92**(2-3): 267-271.

Rabbani, M., V. A. Prakash, et al. (2006). Impact Assessment of CFPR/TUP: A Descriptive Analysis Based on 2002-2005 Panel Data. CFPR/TUP Working Paper Series No. 12. Dhaka and Ottawa, BRAC and Aga Khan Foundation Canada.

Rahman, A. (1999). "Micro-credit Initiatives for Equitable and Sustainable Development: Who Pays?" World Development **27**(1): 67–82.

Salam, M. A., M. A. Alim, et al. (2006). "Spousal Abuse AgainstWomen and Its Consequences on Reproductive Health: A Study in the Urban Slums in Bangladesh." Maternal and Child Health Journal **10**(1).

Schuler, S. R., S. M. Hashemi, et al. (1998). "Men's Violence against Women in Rural Bangladesh: Undermined or Exacerbated by Microcredit Programmes?" Development in Practice **8**(2): 148-157.

Schulz, A. J., B. A. Israel, et al. (2006). "Psychosocial Stress and Social Support as Mediators of Relationship Between Income, Length of Residence and Depressive Symptoms Among African American Women on Detroit's Eastside." Social Science & Medicine **62**: 510-522.

Sulaiman, M., I. Matin, et al. (2006). Microfinance Engagements of the 'Graduated' TUP Members. CFPR/TUP Working Paper Series No. 9. Dhaka and Ottawa, BRAC and Aga Khan Foundation Canada.

UN (2007). Report of the Secretary-General on the Work of the Organization. General Assembly, Official Records, Sixty-second Session. New York, United Nations. **Supplement No. 1 (A/62/1)**.

UNICEF (2007). UNICEF Global Databases 2007 based on MICS, DHS and Other National Surveys in 29 Countries, 2005–2006. .

Walker, S. and I. Matin (2006). "Changes in the Lives of the Ultra Poor: An Exploratory Study." Development in Practice **16**(1): 80-84.

Watson, D., L. A. Clark, et al. (1988). "Development and Validation of Brief Measures of Positive and Negative Affect: The PANAS Scales." Journal of Personality and Social Psychology **54**(6): 1063-70.

WHO (1998). Wellbeing Measures in Primary Health Care/ The DEPCARE Project. Report on a WHO Meeting, World Health Organization, Regional Office for Europe.

WHO (2000). "World Report on Violence and Health ".

Zeller, M., G. Schrieder, et al. (1997). Rural finance for food security of the poor: Implications for research and policy. Washington DC. , International Food Policy Research Institute (IFPRI).

CHAPTER FOUR

POVERTY REDUCTION PROGRAM FOR THE EXTREME POOR IMPROVES NUTRITIONAL STATUS OF PRESCHOOL CHILDREN

INTRODUCTION

The prevalence of undernutrition in children under age 5 years in Bangladesh is at an alarmingly high level, even when compared to the average prevalence among low and middle income countries (Onis, Garza et al. 2006; Black, Allen et al. 2008). The percentage of children suffering from moderate to severe thinness i.e., (weight-for-height <-2 z-score) and stunting (i.e., height-for-age <-2 z-score) are 13% and 43% respectively (UNICEF 2008). The high proportion of women between ages 15 to 45 years with short stature (147.9 ± 5.2cm) and low body-mass index, i.e., <18.5 (38.8% in rural, 29.7% urban poor), increases the risk of intra-uterine growth restriction (IUGR) (Hosegood and Campbell 2003; Shafique, Akhter et al. 2007; Black, Allen et al. 2008). Such growth restriction in utero or stunting in the first 2 years of life causes irreversible damage to growth and development of children resulting in shorter adult height, lower attained schooling, reduced productivity at adult life, and poorer pregnancy outcome (WHO 1995; Grantham-McGregor, Cheung et al. 2007; Black, Allen et al. 2008; Victora, Adair et al. 2008). Furthermore, thinness, stunting, and IUGR contributes to the largest percentage of death risks and disability adjusted life years (DALYs) emphasizing the need for intervention during pregnancy and in early childhood (Black, Allen et al. 2008).

The key underlying cause of undernutrition in women and children is poverty, as depicted in UNICEF conceptual framework (UNICEF 1998). Challenging the Frontiers of Poverty Reduction-Targeting Ultra Poor (CFPR-TUP), an initiative of

Building Resources Across Communities (BRAC), directly intervened on extreme poverty in rural Bangladesh, and has shown considerable success in significantly alleviating poverty among poorest of the poor in rural Bangladesh (BRAC-RED 2004; Matin and Halder 2004; Barua and Sulaiman 2006; Sulaiman and Matin 2006). The program is designed to support the women of extreme poor households by providing income earning opportunities, strengthening socio-political livelihood, and building self-awareness and self-confidence. The resultant benefits of the program relevant to nutrition are decreased food insecurity, increased food consumption in both quantity and quality, improved health-seeking behavior, and increased ability of women's health-related decision-making (BRAC-RED 2004; Ahmed and Rana 2005; Haseen 2006; Rabbani, Prakash et al. 2006). It is, therefore, possible that the program may also improve the nutritional status of women and children in the extreme poor households.

Improving nutritional status of women and children would further contribute to the judgment of cost-benefit and cost-effectiveness of the CFPR-TUP program and rationalize the need for supporting the expansion of such programs. The purpose of this study was to investigate the two-year-lagged impact of the program on nutritional status of women aged 15-45 years, and examine the differential impact of the program on certain age categories of children under age 5 years using the current World Health Organization child growth standard. We hypothesized that women and children who participated in the program would have improved nutritional status as compared to non-participants.

METHODS

Households are selected for the CFPR-TUP program through a multistage selection process, based on their socio-economic condition and availability of women eligible of earning income. The program strengthens participant's socio-political livelihood by building awareness and self-confidence as well as by advocating with local level service-oriented institutions (BRAC 2001). The women of the selected households receive income earning assets, subsistence allowance, and training on basic entrepreneurial skills. The program closely supervises the income generating activities of each woman for a grant phase of 18 months after which the participant women are expected to graduate from CFPR-TUP program and join the conventional BRAC micro-credit program.

Study design and sample size

The study was conducted in Rangpur, Nilphamari, and Kurigram, three northern districts of Bangladesh where the CFPR-TUP program started in 2002. At baseline (i.e., 2002), BRAC collected anthropometric data from children between ages 6-60 months and women aged 15 to 45 years, together with data on a set of demographic and socio-economic variables (BRAC 2004). Information was collected from all households within one-third of randomly selected villages from each of BRAC's 38 Area Offices (AO) that were operating in those 3 districts. About equal number of control households from each village were also included in the baseline survey. The control households were initially selected by BRAC for consideration in the program, but were later excluded during the multistage selection process. Even after the program's grant phase was over, the program households remained different from the control households in a way that more than 70% of the women were likely to have participated in the regular BRAC program (Sulaiman, Matin et al. 2006).

For the purpose of this study, we collected demographic, health, nutritional, and anthropometric data in July-September, 2006 from women and children of the same age groups as in baseline. The majority of the women included in this study were the same women from whom data were collected at baseline. The children surveyed in 2006, however, were not the same individuals as all children who were age 12 months or older at baseline were past age 60 months in 2006. Also, the women included in this study were not necessarily the mothers of the children surveyed. As a result no mother-child pair was available to be used in the analyses.

The data were collected from all program and control households that had at least one child between ages 6-60 months. The households were selected from 159 villages, randomly selected from a baseline village list of 446. Distribution of samples across districts, Area Offices, villages, and household types are shown in Table 4.1.

The design of the study is complex because of the following characteristics. First, anthropometric data of women and children were available from program and control households at baseline and in 2006. Second, comparing a new cohort of children with that of baseline and the matching of program and control households within each village made the design longitudinal at the village level. Third, exclusion of control households for program participation during the selection process provided evidence that the control households were economically better off than the selected households, adding a non-equivalence nature to the design. These three characteristics made our study a non-equivalent control group pre- and post-test quasi-experimental design that is longitudinal at the village level.

Sample sizes needed for adequate power were calculated based on means and standard deviations derived from height and weight of women and children at baseline, and the smallest meaningful difference in means between groups (ref). Powers (1-β) of 80% and 90% with α of 0.05 was used to determine the adequacy of sampling for each of the outcomes. Assuming that the program's effect on the outcome variables could be either positive or negative we assumed two-tailed test to calculate the sample sizes.

Data collection procedure

Data from the program and control households were collected during July to September, 2006 as part of a larger study. Baseline (i.e., 2002) anthropometric information of women and children and other relevant variables were concatenated to the 2006 data to create a longitudinal set of data.

A total of 18 interviewers, selected from a pool of 24 female university graduates were assigned to 9 groups for data collection. Both in-class and field trainings were provided to all 24 interviewers for a period of 3 weeks on the administration of survey form and anthropometric data collection. The training was conducted by an experienced BRAC trainer and the principal investigator. A day-long refreshers training was also given at a field office after the interviewers were sent to test data collection for a day on the actual program households, not participating in the research.

Three Field Supervisors, one in each district, were assigned to provide assistance to the interviewers in data collection, logistics, and cross-checking of questionnaires. All field activities were monitored by a Field Manager, highly experienced in conducting anthropometric surveys. The Principal Investigator (PI) and the Field Manager

frequently visited several data collection sites each day to ensure quality of the data. Interviewers were in frequent communication with the Field Manager and the PI through cellular telephones to instantly resolve any field related issue and to convey messages on strategic changes.

Demographic and socio-economic information were collected using a pre-tested survey form. Wooden length/height boards were used to measure height and recumbent length to a level of 1 mm precision. Weight of the women and children were measured to a precision of 100gm using Uniscales manufactured by SECA company.

Prior to each interview, informed written consent was obtained from each women aged 18 years and over. Parents or legal guardians signed the consent from for children and women below age 18 years.

The study protocol was approved by Bangladesh Medical Research Council, Dhaka, Bangladesh and University Committee on Human Subjects, Cornell University, USA.

Data entry and preliminary cleaning was done by a data entry specialist at Research and Evaluation Division of BRAC. Further cleaning was done by the Investigators.

Statistical analysis

Analyses of children's anthropometric data were done separately for four different age categories under the general assumption that children of certain age categories had differential length of exposure to the program and that there would be differential biological susceptibility to the intervention (Figure 4.4). Height, weight, age, and sex

were used to calculate weight-for-age, height-for-age, weight-for-height and body-mass-index (BMI)-for-age for each child. We used WHO Anthro (version 2.0.2) software to compute the deviation of each child's measurement (i.e., z-score) from the reference mean, derived from the current World Health Organization child growth standard (WHO 2006). BMI of women was computed dividing weight in kg by height in meter squared.

All outcome variables were tested for normality. A non-normal distribution was observed only in women's BMI scores. Logarithmic transformation was used to create a scale of normal distribution of BMI before using in the multilevel analysis. Control and program means and standard deviations were reported on the untransformed scale.

Linear mixed (random-intercept) repeated-measures models were used to account for the clustering affect of districts, Area Offices, and villages in measuring the effect of the program on all outcomes 4 years after the program began. After preliminary analyses, however, we excluded districts from the model as no significant variation was found among districts. Inclusion of district also made the models less efficient and did not change any of the results. Area Office and village were used as random effect variables in the models.

Having repeated measures at village level refers to the self-adjusting nature of the design and obviated the need to control for demographic and socio-economic covariates. In the analyses, therefore, we only controlled for biological characteristics that are strong determinants of growth performance in children (i.e., height, age, and sex) and of nutritional status of women (i.e., height and age). Height was not added as a covariate in the model where the dependent variable was height-for-age. In the

preliminary analyses, we also tested the models controlling for height-squared and age-squared, but found no effect of them on the overall results.

Although the standardized scores of weight-for-age, height-for-age, weight-for-height, and BMI-for-age theoretically control for biological characteristics, when used in the initial analyses, age and sex were found to be strong determinants of all child growth outcomes and height was a strong determinant for weight outcomes. Similarly, in the model analyzing women's BMI as an outcome, height, age, and logarithm-transformed age of women were found as significant determinants of BMI. Therefore, these covariates were included in the regression models.

The following two statistical models were used in the final analyses adding the interaction between program and time. The interaction refers to the difference between the program-control differences at baseline and in 2006.

Model 1 estimated the effect of the program on weight-for-age, height-for-age, weight-for-height, and BMI-for-age of each age category of children. Y_{iva} in the model refers to the mean of the response measures of outcome variables while subscripts i, v and a, denotes individual, village, and area levels respectively. The random effect associated with the intercept for area is represented by u_a, the random effect associated with the intercept for village within area is represented by $u_{v/a}$, and the residual is denoted by ε_{iva}.

$$Y_{iva} = \beta_{0i} + \beta_{1i}\,\text{Program}_{iva} + \beta_{2i}\,\text{Year}_{iva} + \beta_{3i}\,\text{Program*Year}_{iva}$$
$$+ \beta_{4i}\,\text{Height}_{iva}\,* + \beta_{5i}\,\text{Age}_{iva} + \beta_{6i}\,\text{Sex}_{iva} + u_a + u_{v|a} + \varepsilon_{iva} \text{ --------------(1)}$$

* this variable was excluded from the model estimating the effect of the program on height-for-age.

Model 2 was used to analyze the effect of the program on women's BMI. Y_{iva} represents mean of log transformed BMI of women. All subscripts, random effects, and residual represent the same meaning as in model 1.

$$Y_{iva} = \beta_{0i} + \beta_{1i}\,\text{Program}_{iva} + \beta_{2i}\,\text{Year}_{iva} + \beta_{3i}\,\text{Program*Year}_{iva}$$
$$+ \beta_{4i}\,\text{Height}_{iva} + \beta_{5i}\,\text{Age}_{iva} + \beta_{6i}\,\text{LogAge}_{iva} + u_a + u_{v|a} + \varepsilon_{iva} \text{------------(2)}$$

All analysis were performed using the Statistical Package for Social Sciences (SPSS WIN 15).

RESULTS

Data were collected on 1971 households at baseline from which 2468 children and 1894 women were available (Table 4.1). In 2006, we surveyed 1438 households and achieved samples of 1663 children and 1657 women.

Table 4.1: Distribution of Area Offices, villages, households, and sample women and children across districts.

Districts	Rangpur		Nilphamari		Kurigram		Total
Area Offices	15		12		11		38
Villages	69		30		60		159
No. of households in 2002	623		605		743		1971
No. of households in 2006	420		438		580		1438
	Program	*Control*	*Program*	*Control*	*Program*	*Control*	
Number of children in 2002	418	343	442	367	440	458	2468
Number of children in 2006	195	301	208	309	231	419	1663
Number of women in 2002	331	273	308	271	345	366	1894
Number of women in 2006	195	298	208	309	231	416	1657

The means of weight, height, and height-for-age of both program and the control children improved from baseline (i.e., 2002) to 2006, while a general decline in weight-for-height, and BMI-for-age was found in all age categories (Table 4.2). In terms of weight-for-age, the program children improved in the older two age categories and the control children improved in younger age categories.

Table 4.2: Unadjusted means and standard deviations (in parenthesis) by age, year and household category.

Age groups	6-11 months				12-23 months			
Year	2002		2006		2002		2006	
Household type	*Program*	*Control*	*Program*	*Control*	*Program*	*Control*	*Program*	*Control*
Sample size	*142*	*140*	*68*	*97*	*231*	*210*	*117*	*203*
Male/female ratio	1.09	0.97	1.19	0.94	0.85	1.26	0.95	0.85
Age	8.29 (1.65)	8.37 (1.51)	8.49 (1.76)	8.92 (1.59)	17.01 (3.15)	17.31 (3.04)	17.62 (3.36)	17.21 (3.45)
Weight	6.52 (1.53)	6.57 (1.70)	6.75 (1.16)	6.87 (1.07)	7.60 (2.41)	7.88 (2.18)	8.17 (1.50)	8.16 (1.31)
Height	62.53 (11.42)	62.47 (12.57)	65.88 (6.50)	67.07 (4.02)	67.67 (17.89)	69.07 (16.33)	74.69 (5.85)	74.40 (6.04)
Height-for-age z-score	-2.50 (1.74)	-2.34 (1.60)	-1.83 (1.22)	-1.71 (1.20)	-2.98 (1.74)	-2.98 (1.78)	-2.29 (1.88)	-2.22 (1.39)
Weight-for-height z-score	-0.51 (2.15)	-0.54 (2.29)	-1.21 (1.08)	-1.15 (1.07)	-0.96 (1.68)	-0.82 (1.52)	-1.50 (1.32)	-1.39 (1.21)
Weight-for-age z-score	-1.98 (1.19)	-1.87 (1.42)	-2.01 (1.19)	-1.86 (1.13)	-2.22 (1.40)	-2.12 (1.25)	-2.25 (1.33)	-2.12 (1.20)
BMI-for-age z-score	-0.68 (1.95)	-0.67 (2.12)	-1.28 (1.09)	-1.18 (1.08)	-0.52 (1.78)	-0.38 (1.63)	-1.16 (1.40)	-1.07 (1.25)

Table 4.2 (continued)

Age groups	24-35 months				36-60 months			
Year	2002		2006		2002		2006	
Household type	*Program*	*Control*	*Program*	*Control*	*Program*	*Control*	*Program*	*Control*
Sample size	*273*	*218*	*116*	*252*	*654*	*598*	*334*	*487*
Male/female ratio	0.90	1.00	1.30	0.94	1.08	1.00	1.07	1.02
Age	29.13 (3.16)	29.45 (3.36)	30.10 (3.18)	29.39 (3.24)	48.41 (8.18)	48.61 (8.11)	47.54 (7.01)	47.19 (6.77)
Weight	9.22 (2.50)	9.97 (4.40)	10.09 (1.54)	9.98 (1.45)	11.48 (5.37)	11.69 (4.05)	12.20 (1.88)	12.18 (1.68)
Height	76.20 (18.64)	77.75 (20.80)	82.71 (8.72)	83.08 (6.17)	84.76 (28.04)	86.57 (25.10)	92.72 (6.26)	92.58 (7.50)
Height-for-age z-score	-2.95 (1.84)	-2.85 (1.79)	-2.32 (1.42)	-2.19 (1.61)	-2.39 (1.54)	-2.34 (1.63)	-2.32 (1.26)	-2.24 (1.17)
Weight-for-height z-score	-1.07 (1.33)	-0.76 (1.40)	-1.35 (1.04)	-1.39 (0.93)	-1.14 (1.25)	-1.13 (1.21)	-1.22 (1.11)	-1.28 (0.98)
Weight-for-age z-score	-2.39 (1.20)	-2.12 (1.25)	-2.24 (1.14)	-2.20 (1.15)	-2.19 (1.09)	-2.14 (1.16)	-2.19 (1.08)	-2.18 (0.97)
BMI-for-age z-score	-0.64 (1.53)	-0.34 (1.57)	-1.07 (1.10)	-1.14 (1.00)	-0.89 (1.32)	-0.88 (1.27)	-0.98 (1.11)	-1.05 (0.98)

In general, the program children of all age categories were found worse off than the control children showing lower means in all variables at baseline (i.e., 2002) (Table 4.2). The means of raw height, and weight-for-height z-scores in the program children ages 6-11 months, however, were marginally higher than that of the control group. Two years after 18-month grant phase of the program was over (i.e., 2006), the program children of ages 36-60 months became better off than the control children in terms of weight, height, weight-for-height, and BMI-for-age. Children ages 24-35 months were also found better off in weight, weight-for-height, and BMI-for-age while the children of ages 12-35 months improved only in height. The program

children of ages 6-11 months, however, were found to be worse off than the control children in all measures.

The unadjusted means show that the BMI scores of both program and control women deteriorated from baseline to 2006, although improvement was observed in weight and height (Table 4.3). The program women were worse off than the control women at baseline and the status remained the same in 2006.

Table 4.3: Unadjusted means and standard deviations (in parenthesis) of women's age, weight, height and body mass index (BMI) by year and household category

Year	2002		2006	
Household type	Program	Control	Program	Control
Sample size	984	910	634	1023
Age	27.66 (6.38)	26.80 (6.49)	27.41 (5.76)	26.20 (5.66)
Weight	41.41 (4.98)	42.10 (5.31)	41.96 (5.38)	42.33 (5.56)
Height	147.63 (6.47)	148.28 (5.81)	148.93 (5.65)	149.53 (5.49)
BMI	18.99 (1.88)	19.14 (2.10)	18.90 (2.05)	18.91 (2.09)

The results of linear mixed (random-intercept) repeated-measures analyses with children's height-for-age and weight-for-height z-scores and women's BMI as the response measures are presented in Table 4.4. Our major interest was to find if the program-control difference changed directionality from baseline (i.e., 2002) to 2006 and to find if the change was large enough to be of significant biological importance.

Table 4.4: Adjusted means of height-for-age and weight-for-height z-scores of children, and body mass index (BMI) of women between age 15-45 years.

		2002			2006				
	N	Program	Control	Difference	Program	Control	Difference	Interaction	
		A	B	A-B	C	D	C-D	(C-D)-(A-B)	(p)
Height-for-age z-score									
6-11months	*440*	-2.42	-2.31	-0.12	-1.65	-1.58	-0.08	0.04	0.89
12-23 months	*737*	-2.98	-2.93	-0.05	-2.21	-2.18	-0.03	0.01	0.96
24-35months	*824*	-2.92	-2.83	-0.09	-2.29	-2.16	-0.13	-0.04	0.88
36-60 months	*1973*	-2.31	-2.28	-0.03	-2.22	-2.17	-0.05	-0.03	0.83
Weight-for-height z-score									
6-11months	*440*	-0.08	0.02	-0.10	-0.38	-0.23	-0.15	-0.06	0.87
12-23 months	*737*	-0.94	-0.79	-0.15	-1.44	-1.32	-0.12	0.03	0.91
24-35months	*820*	-1.04	-0.72	-0.32*	-1.27	-1.30	0.03	0.35	0.05
36-60 months	*1973*	-1.04	-1.02	-0.03	-1.13	-1.19	0.06	0.08	0.43
Women's BMI	*3547*	1.57	1.57	-0.00	1.57	1.57	-0.00	0.00	0.34

Adjusted for age, sex, and height in children, and height, age, and log transformed age in women.
*Significant at 0.01 level

Both at baseline and in 2006, the program children of all age categories were worse off than the control children in terms of mean height-for-age z-score. The difference between the program and the control children reduced in the younger age categories (i.e., 6-11 months and 12-24 months) while the difference further increased in the older age categories (i.e., 24-35 months and 36-60 months). We did not find any significant interaction of program and year in the analyses, meaning that the program did not have any effect on height-for-age when compared to control (Table 4.4 and Figure 4.1).

Mean weight-for-height z-scores of all age categories show that, at baseline, the program children were thinner than the control children. A significant (-0.32 z-score, $p=0.01$) program-control difference was observed in age category 24-35 months. In 2006, program children of age categories 24-35 months and 36-60 months became better off than the control children. The difference of differences in children of ages 24-35 months was statistically significant ($p=0.05$) indicating an interaction between program and year. Therefore, the improvement of mean weight-for-height z-scores found in this age category was an effect of the program (Table 4.4 and Figure 4.2).

Considering within-group changes from baseline to 2006, both program and the control children, in general, improved in height-for-age and deteriorated in weight-for-height (Table 4.4 and Figure 4.1). The older children gained less in height-for-age over the years compared to the younger age categories. Because of a better nutritional status compared to all other age categories at baseline, this group in 2006, however, was no different than the children of ages 12-35 and 36 to 60 months categories. On the other hand, although the children of age category 6-11 months improved as much did the other age categories, they moved from moderate stunted to mild stunted status in 2006 because of a better start at baseline.

The decline in thinness was significant ($p<0.01$) in all age categories of the control children, except ages 6-11 months (Table 4.4 and Figure 4.2). In contrast, with the exception of age category 12-23 months ($p=0.01$), we did not find any significant baseline-to-2006 change in the program children.

We found no significant program-control difference at baseline or in 2006 in women's anthropometric status expressed as body-mass index. Neither group showed

improvement from baseline to 2006. Running separate models with women's age categorized into different groups also did not show any difference between program-control or over time (Table 4.4).
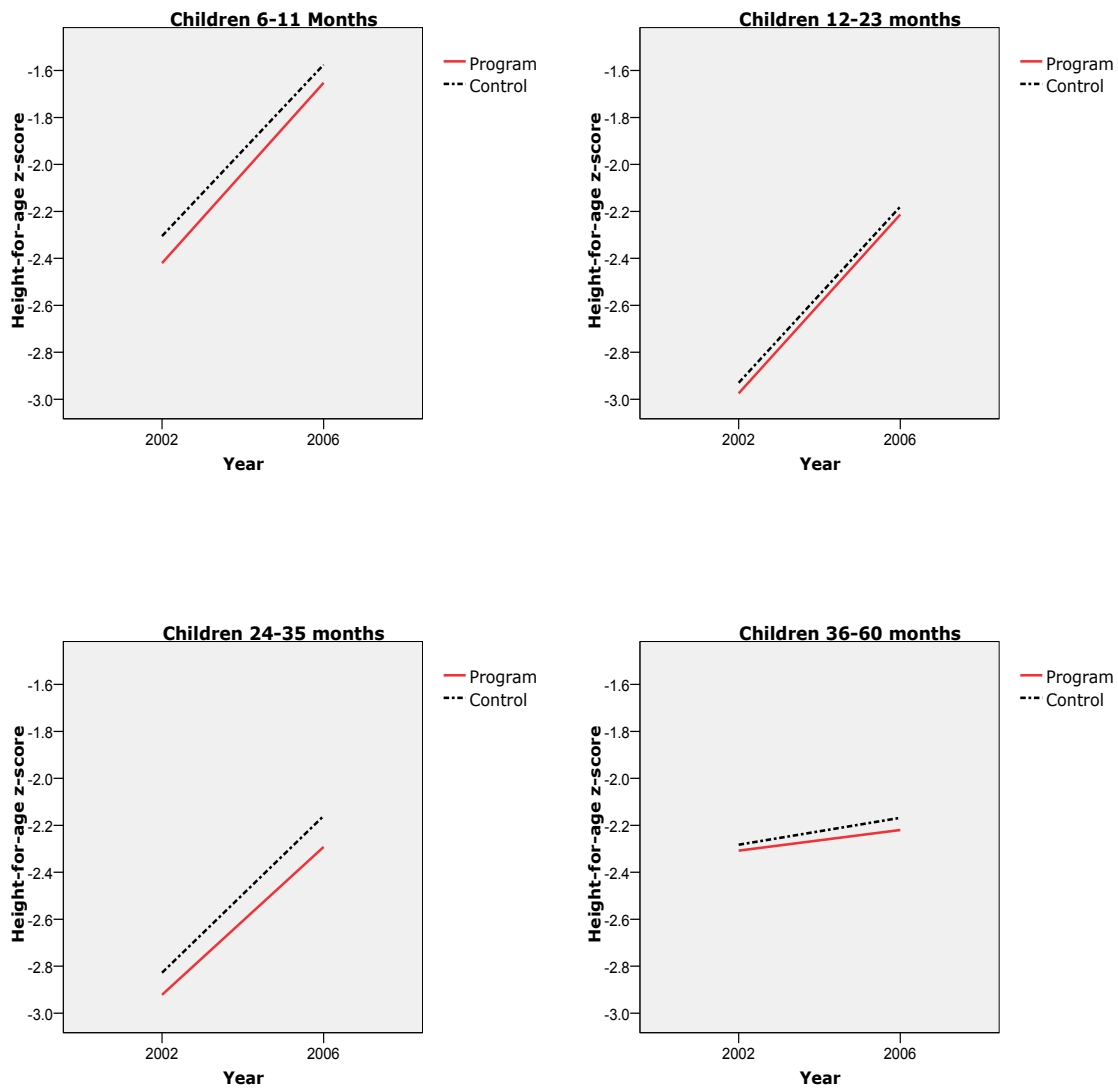
Figure 4.1: Comparison of height-for-age z-scores of children by household types over time.
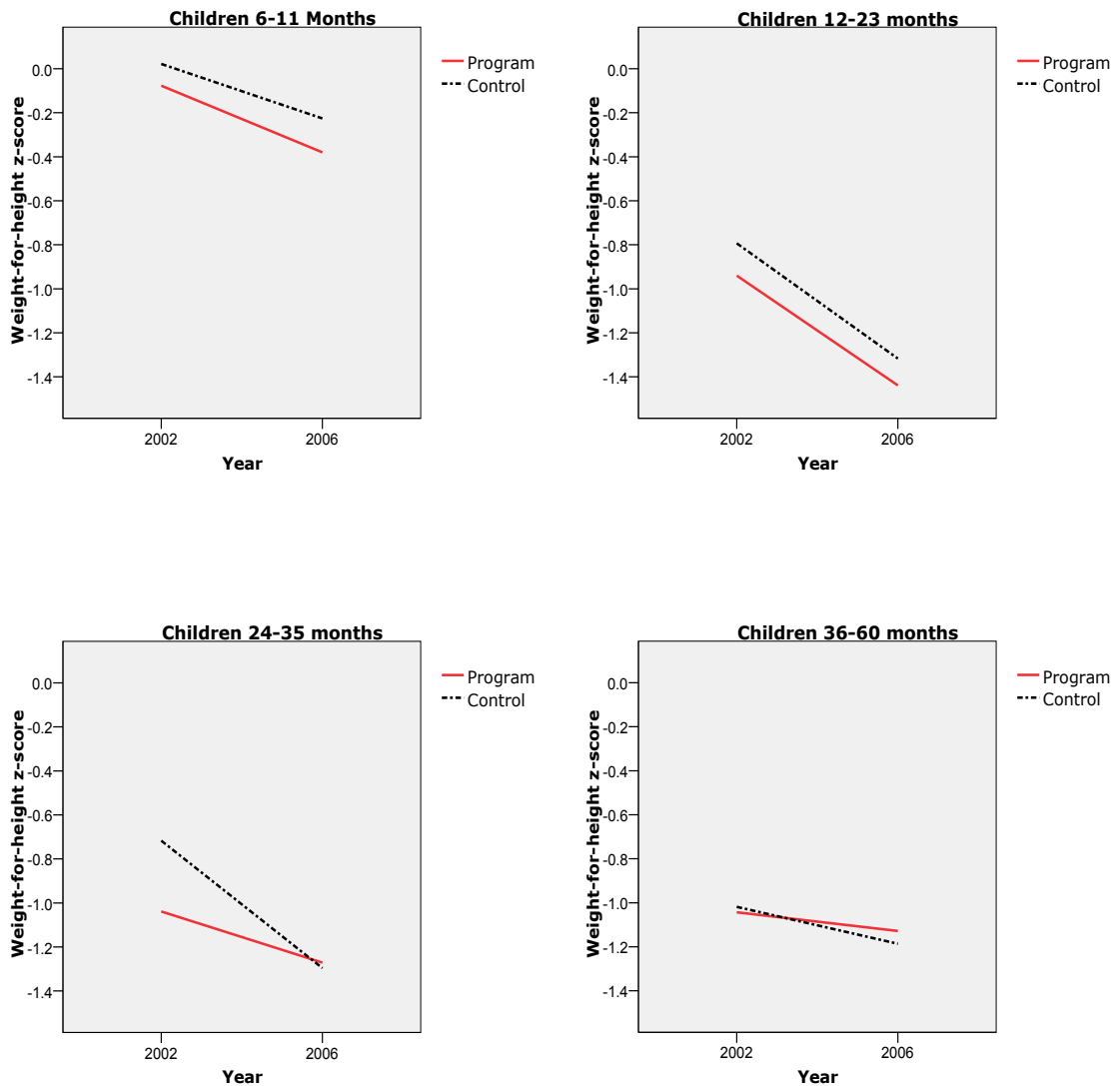
Figure 4.2: Comparison of weight-for-height z-scores of children by household types over time.

An alternate way of displaying the difference in weight-for-height between groups is to plot the mean weight-for-height of each age category by year (i.e., 2002 and 2006) (Figure 4.3). This shows that in 2002 the program children of all age categories were worse off compared to control children, while the biggest difference was shown in age

category 24-35 months. In 2006 program children of both age categories, i.e., 24-35 months and 36-60 months, were better off then the control children.
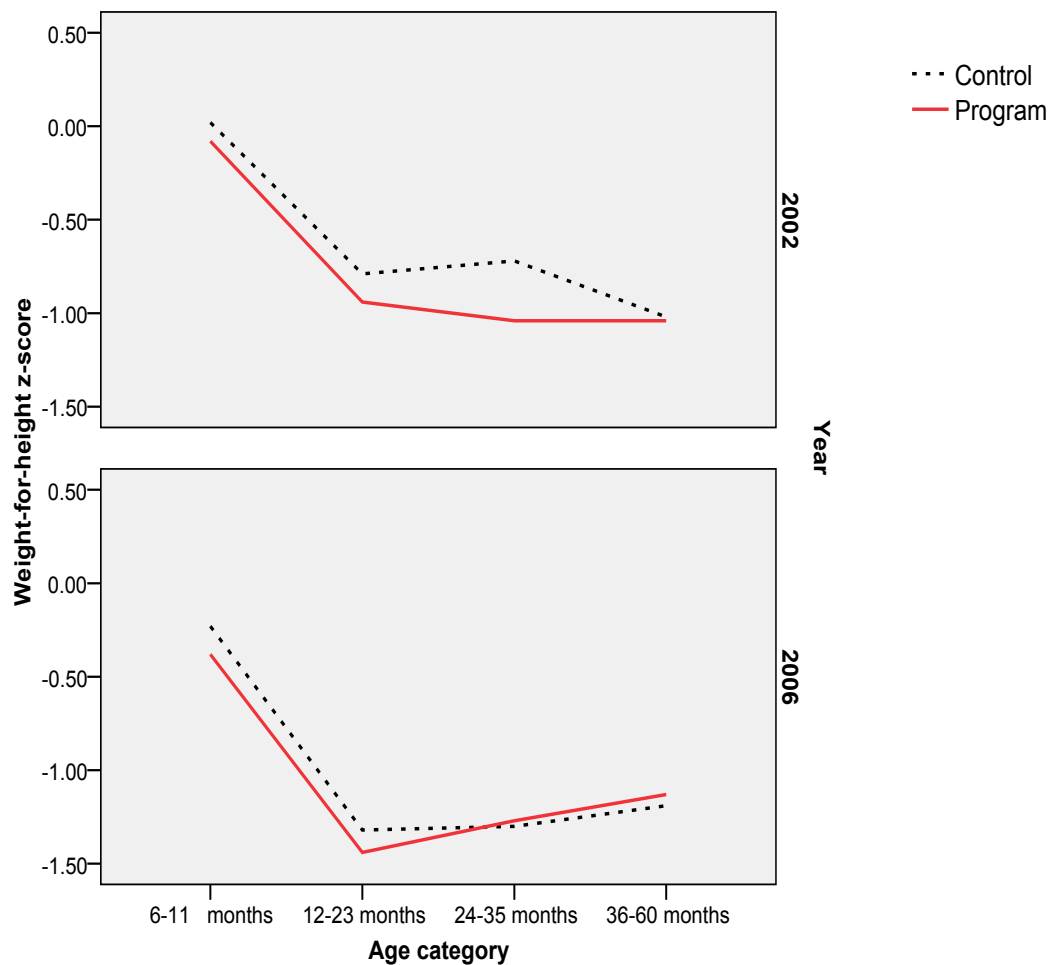
Figure 4.3: Comparison of weight-for-height z-scores of children by age categories, household types, and year (i.e., 2002 and 2006)

DISCUSSION

The purpose of this study was to investigate the village-level effect of the CFPR-TUP program on the nutritional status of children age under 5 years and women aged 15-45 years of households participating in the program. Our primary interest was to estimate

the differential impact of the program on thinness (i.e., weight-for-height) and linear growth (i.e., length/height-for-age) on different age categories of children after a lag period of two years since the end of the grant phase of the program. These two indices refer to the short period of weight loss (i.e., acute weight loss) and the chronic interference of growth in the children, respectively, and helped us to explain the differential effect on child nutritional status due to variation in the duration of exposure to the program (Waterlow 1972).

The key finding of the study is that at baseline the program children of ages 24-35 months were thinner than the control children by a significantly large difference ($p<0.01$) in weight-for-height z-score. The CFPR-TUP program has been able to reverse this gap by significantly reducing thinness in the program children relative to the control children. In general, weight-for-height deteriorated in both groups, but not significantly so in the children of program households. We also found that, except age category 36-60 months, height-for-age significantly improved in both program and the control children from baseline to 2006. No difference between households was found in the nutritional status of women measured as body-mass index.

For the purpose of better investigation we ran the linear mixed (random-intercept) repeated-measures models after categorizing children into four age groups. The rationale behind this were as follows. First, the children of different age groups are differentially susceptible to intervention or insult as the growth pattern is different according to age (Martorell and Habicht 1986). Children in the developing countries are born with heights closer to the 50th percentile of standard growth charts but begin to fall precipitously sometime during second and sixth months of their lives (Underwood and Hofvander 1982). Similar pattern is also seen in weight-for-height,

particularly among the children of Indian subcontinent (Brown, Black et al. 1982; Martorell, Leslie et al. 1984). Second, the CFPR-TUP program grant phase was operational for 18 months beginning towards the end of year 2002. Children of different age categories, therefore, had different period of exposure to the grant phase of the program (Figure 4.4).
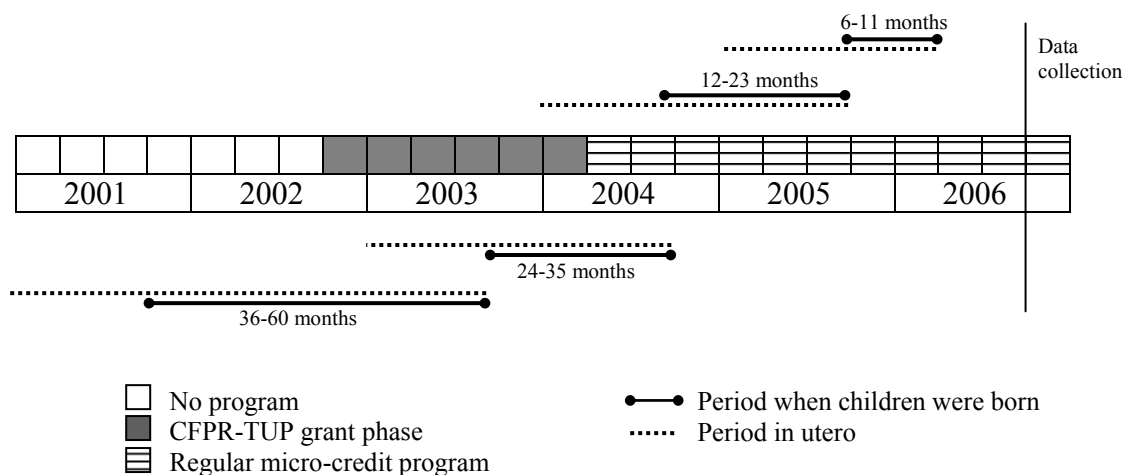
Figure 4.4: Exposure of children to the program by age categories.

Most of the children of age category 24-35 months were born or were in utero during the grant phase. Compared to the other age categories, children of this age, therefore, received more benefits of the program during their critical age of growth and development that started in their mother's utero (Frongillo 1999; Thompson and Nelson 2001; Grantham-McGregor, Cheung et al. 2007). Children who were born during the few months following the end of the grant phase of the program also benefited from their mothers being in the program while pregnant (Falkner, Holzgreve et al. 1994; Kramer and Victora 2001; Schroeder 2001). Previous studies on CFPR-TUP showed that, although the control households increased consumption compared to their baseline status, the program significantly improved energy and nutrient

82

consumption in children and adults of program households both compared to their previous status and to that of the control households. The improvement was both in macro and micronutrients (Haseen 2007). The program also improved food security, household purchasing capacity, access to health care, and health seeking behavior of the participants (Ahmed and Rana 2005; Rabbani, Prakash et al. 2006; Ahmed and Hossain 2007). Better nutrition and access to health care for the program children may also have resulted in better immunity and resilience against morbidity (Engle, Castle et al. 1996). Therefore it was reasonable to find that the program children of age category 24-35 months had better nutritional status (i.e., anthropometric outcome) than the control children.

To ensure that the program-control difference in age category 24-35 months was not due to anomaly in the data, we did a thorough investigation by looking at height and weight data of children grouped by ages in month. No anomaly in pattern was detected.

In relative terms both program and control children of 2006 were taller across all age categories. We also found that in the oldest age category the effect is small compared to the other age categories. When we look at weight-for-height, we see the opposite. On average, these children are getting taller in these communities and they are also getting thinner. This is consistent with the idea that if the increase in height is at a faster rate, then the weight increases relatively slower. Although not significantly, the program children started being worse off in height-for-age than the control children at baseline (i.e., 2002) and the program-control difference remained the same although both groups improved over the years. Hypothetically, the overall reduction of stunting and the increase in thinness at the village level could be due to variety of reasons.

First, it is expected that there had been increased economic activity in the village due to the program's income generating activities leading to a better economy at the village level in general. Also there could have been other national level programs or policies that improved the overall socio-economic status and food security. These factors may have led to the improvement in height of the children (Frongillo, Onis et al. 1997). Second, there could have been any short-term event (i.e., food shortage, morbidity) that occurred in the immediate past to the data collection, which differentially affected program and control children in terms of weight gain. Such events could not have affected the height of the children as height is a result of a chronic detrimental effects. Third, although we found no difference between program and control women in measures of BMI, evidence shows that the micronutrient status of the program women could have been better than that of the control women (Haseen 2006), leading to better pregnancy outcomes and healthier children in their early lives (Winkvist, Habicht et al. 2000).

Using a non-equivalent control group pre- and post-test quasi-experimental design, our study accounted for the baseline economic differences between households and confirmed that the results of our analyses (i.e., program-control difference in weight-for-height) was an effect of the program. Using linear mixed repeated-measures models was a different approach to evaluate CFPR-TUP program which allowed us to account for the clustering affect of Area Offices, and villages. Controlling for determinants of nutritional status, i.e., height, age, and sex in children and height and age in women added further strength to our analyses. Another important aspect of this study is that we used current WHO child growth standard.

The CFPR-TUP program has been highly successful in targeting the extreme poor and had shown sustainable benefit to the participants in economic, biologic, and human terms two years after the intervention was over. This study provides further evidence that if implemented well, economic intervention program directed to the poorest of the poor may improve child nutrition and ensure further sustainable gain in productivity of households in future. This provides a stronger argument for evaluating poverty reduction programs, particularly targeted to extreme poor, beyond economic terms and mobilizing internal and external resources to further support such programs.

REFERENCES

Ahmed, S. M. and M. A. Hossain (2007). Taking Doctors Where the Ultra Poor are: Assessment of the Panel Doctor Scheme of CFPR/TUP Programme. CFPR/TUP Working Paper Series No. 17. Dhaka and Ottawa, BRAC and Aga Khan Foundation Canada.

Ahmed, S. M. and A. M. Rana (2005). Customized Development Interventions for the Ultra Poor: Preliminary Change Assessments of Health and Health-seeking Behaviour (CFPR/TUP 2002 to 2004). CFPR/TUP Working Paper Series No. 7. Dhaka and Ottawa, BRAC and Aga Khan Foundation.

Barua, P. and M. Sulaiman (2006). Targeting the Poorest in Microfinance: Poverty Outreach of BDP Ultra Poor Programme. CFPR/TUP Working Paper Series No. 13. Dhaka and Ottawa, BRAC and Aga Khan Foundation Canada.

Black, R. E., L. H. Allen, et al. (2008). "Maternal and Child Undernutrition: Global and Regional Exposures and Health Consequences." The Lancet **371**(9608): 243-260.

BRAC-RED (2004). Stories of Targeting: Process Documentation of Selecting the Ultra Poor for CFPR/TUP Programme. CFPR/TUP Working Paper Series No. 1. Dhaka and Ottawa, BRAC and Aga Khan Foundation Canada.

BRAC (2001). Overview Proposal: Challenging the Frontiers of Poverty Reduction: Targeting the Ultra Poor- Targeting Social Constraints, BRAC, Research and Evaluation Division.

BRAC (2004). Towards a Profile of the Ultra Poor in Bangladesh: findings from CFPR/TUP Baseline Survey, BRAC.

Brown, K. H., R. E. Black, et al. (1982). "Patterns of Physical Growth in Longitudial Study of Young Children in Rural Bangaldesh." American Journal of Clinical Nutrition **36**: 294-302.

Engle, P. L., S. Castle, et al. (1996). "Child development: Vulnerability and resilience." Social Science & Medicine **43**(5): 621-635.

Falkner, F., W. Holzgreve, et al. (1994). "Prenatal Influence on Postnatal Growth: Overview and Pointers for Needed Research " European Journal of Clinical Nutrition **48**: S15-S24.

Frongillo, E. A. (1999). "Symposium: Causes and Etiology of Stunting." Journal of Nutrition **129**(2s): 529-530.

Frongillo, E. A., M. d. Onis, et al. (1997). "Socioeconomic and Demographic Factors are Associated with Worldwide Patterns of Stunting and Wasting of Children." The Journal of Nutrition **127**(12): 2302-2309.

Grantham-McGregor, S., Y. B. Cheung, et al. (2007). "Developmental Potential in the First 5 Years for Children in Developing Countries: ." The Lancet **369**(9555): 60-70.

Haseen, F. (2006). Change in Food and Nutrient Consumption Among the Ultra Poor: Is the CFPR/TUP Programme Making a Difference? Working Paper No.11. Dhaka and Ottawa, BRAC and Aga Khan Foundation Canada.

Haseen, F. (2007). "Change in food and energy consumption among the ultra poor: is the poverty reduction programme making a difference?" Asia Pacific Journal of Clinical Nutrition **16**(Suppl 1): 58-64.

Hosegood, V. and O. M. Campbell (2003). "Body Mass Index, Height, Weight, Arm Circumference, and Mortality in Rural Bangladeshi Women: a 19-y Longitudinal Study." American Journal of Clinical Nutrition **77**: 341-347.

Kramer, M. and C. G. Victora (2001). Low Birth weight and perinatal Mortality. Totowa, New Jersey, Humana Press Inc.

Martorell, R. and J.-P. Habicht (1986). Growth in Early Childhood in Developing Countries. Human Growth: A Comprehensive Treatise. F. Falkner and J. Tanner. New York, Plenum Publishing. **3**.

Martorell, R., J. Leslie, et al. (1984). "Characteristics and Determinants of Child Nutritional Status in Nepal." American Journal of Clinical Nutrition **39**: 74-86.

Matin, I. and S. R. Halder (2004). Combining Methodologies for Better Targeting of the Extreme Poor: Lessons from BRAC's CFPR/TUP Programme. Working Paper No. 2. Dhaka and Ottawa, BRAC and Aga Khan Foundation Canada.

Onis, M. d., C. Garza, et al. (2006). "WHO Child Growth Standards." Acta Paediatr Suppl **450**(1-101).

Rabbani, M., V. A. Prakash, et al. (2006). Impact Assessment of CFPR/TUP: A Descriptive Analysis Based on 2002-2005 Panel Data. CFPR/TUP Working Paper Series No. 12. Dhaka and Ottawa, BRAC and Aga Khan Foundation Canada.

Schroeder, D. G. (2001). Malnutrition. Totowa, NJ, Humana Press Inc.

Shafique, S., N. Akhter, et al. (2007). "Trends of Under- and Overweight Among Rural and Urban Poor Women Indicate the Double Burden of Malnutrition in Bangladesh." International Journal of Epidemiology **doi:10.1093/ije/dyl306**.

Sulaiman, M. and I. Matin (2006). Targeting Effectiveness of CFPR/TUP in Scale-up Environment. CFPR/TUP Working Paper Series No. 8. Dhaka and Ottawa, BRAC and Aga Khan Foundation Canada.

Sulaiman, M., I. Matin, et al. (2006). Microfinance Engagements of the 'Graduated' TUP Members. CFPR/TUP Working Paper Series No. 9. Dhaka and Ottawa, BRAC and Aga Khan Foundation Canada.

Thompson, R. A. and C. A. Nelson (2001). "Developmental Science and the Media: Early Brain Development." American Psychologist **56**: 5-15.

Underwood, B. A. and Y. Hofvander (1982). "Appropriate timing for complementary feeding of the breast-fed infant. A review." Acta Paediatrica Scandinavica **294**(Suppl.): 1-32.

UNICEF (1998). The State of The World's Children 1998, United Nations Children's Fund.

UNICEF (2008). The State of The World's Children 2008, United Nations Children's Fund.

Victora, C. G., L. Adair, et al. (2008). "Maternal and child undernutrition: consequences for adult health and human capital." <u>The Lancet</u> **371**(9609): 340-357.

Waterlow, J. C. (1972). "Classification and Definition of Protein-Calorie Malnutrition." <u>British Medical Journal</u> **3**: 566-69.

WHO (1995). <u>Physical Status: Use and Interpretation of Anthropometry</u>. Geneva.

WHO (2006). WHO Child Growth Standards: Length/height-for-age, Weight-for-age, Weight-for-length, Weight-for-height and Body Mass Index-for-age: Methods and Development. Geneva, World Health Organization.

Winkvist, A., J. Habicht, et al. (2000). <u>Malnourished mothers maintain their weight throughout pregnancy and lactation</u> New York, Kluwer Academic/Plenum Publishers.

CHAPTER FIVE

EFFECT OF BRAC'S POVERTY REDUCTION PROGRAM ON DISTRESS AND

WELLBEING IS EXPLAINED BY STRESS-SUPPRESSING MODEL

INTRODUCTION

Programs aiming at alleviating poverty often fail to reach the deepest of the poverty

pit because of weak targeting mechanism or due to self-exclusion of the potential

beneficiaries or both (Morduch and Haley 2001; Matin and Hulme 2003). Challenging

the Frontiers of Poverty Reduction-Targeting the Ultra Poor (CFPR-TUP) is an

initiative of Building Resources Across Communities (BRAC) that directly intervenes

on extreme poverty in rural Bangladesh, and has shown considerable success in

effectively reaching the poorest of the poor and improving their economic wellbeing

(BRAC-RED 2004; Matin and Halder 2004; Ameen and Sulaiman 2006; Sulaiman

and Matin 2006). The program supports the women of extreme poor households by

providing income-earning opportunities, strengthening socio-political livelihood, and

building self-awareness and self-confidence. In addition to significantly alleviating

poverty, the program has benefited the participants in multiple ways that indicate

improvement in their overall quality of life. In our first paper (Chapter 3), we showed

that the program has an effect on two such outcomes, i.e., reduced distress and

improved subjective wellbeing.

Distress is the negative cognitive appraisal of acute or chronic stress (Serido, Almeida

et al. 2004). Subjective wellbeing is the scientific name for how people evaluate their

lives (Mroczek and Kolarz 1998). The fact that the program reduced distress and

improved wellbeing is theoretically consistent with a stress-suppressing model (Ensel

and Lin 1991). In this model, distress is the outcome of exposure to stressful

conditions and an individual's appraisal of those conditions. The program could theoretically act as a resource to alleviate the stressors and thereby reduce distress. Studies show that long-term (i.e., chronic) stressors also affect wellbeing by increasing the negative affects of life (Pearlin 1982; Lazarus and Folkman 1984; Repetti and Wood 1997; Serido, Almeida et al. 2004).

In this paper, we investigate how the program may have exerted its effects on distress and wellbeing, and which factor or factors were the most important mediators of the program effects. We hypothesized that the CFPR-TUP program could have reduced distress and wellbeing through two major pathways. First, the program could have a direct effect on distress and wellbeing. Second, the effect of the program could be mediated through alleviation of stressors such as domestic violence, food insecurity, poverty, and social constraints. In addition, the effect of the program on wellbeing could be mediated further through distress.

This investigation was potentially valuable for two reasons. First, it provides a test of the stress-suppressing model in this context and helps identify important stressors experienced by program participants. Second, evidence that the results are consistent with this theoretical model would lend further plausibility to the conclusion that the program improves the quality of life of its participants.

METHOD

We developed a conceptual framework (Figure 5.1) that posits multiple pathways leading from program to distress to wellbeing. Stressors in this framework are domestic violence, food insecurity, measured and perceived economic status, and social constraints.
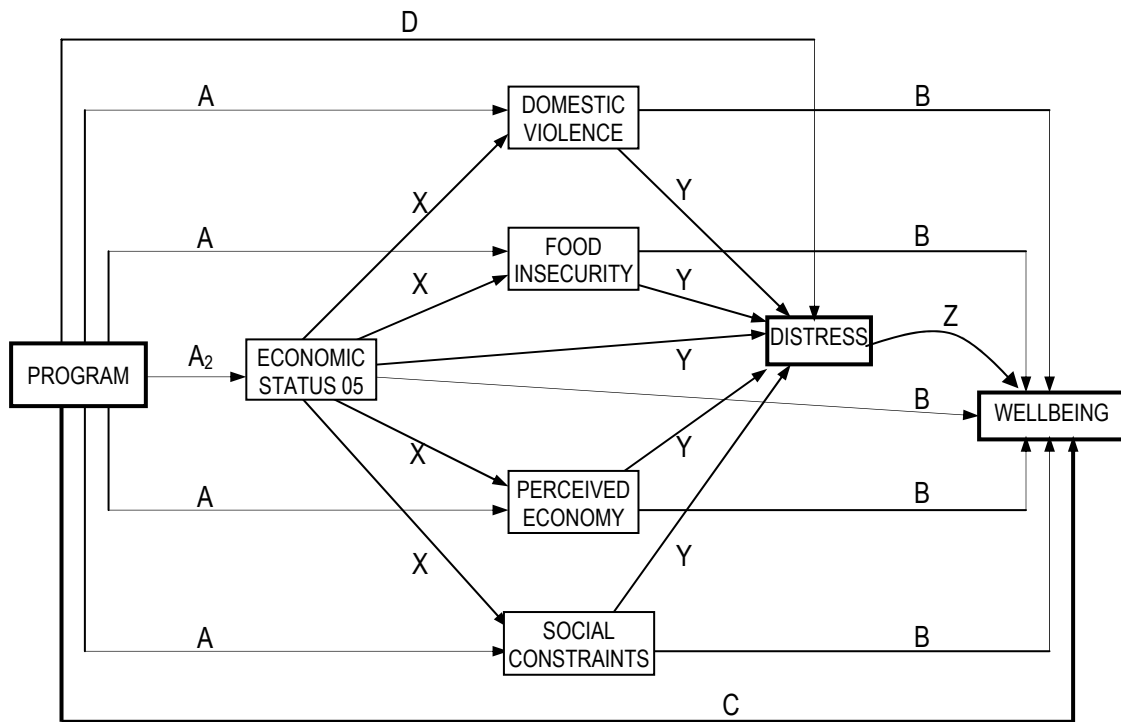
Figure 5.1: Conceptual framework showing possible pathways through which program effects wellbeing and distress.

There are five possible sets of pathways through which the program could affect wellbeing. Pathways A*B (also A_2*B) show the effect of the program on wellbeing through the stressors. Pathway C is the direct effect of the program. Pathways A*Y*Z, A_2*X*Y*Z, and D*Z involve distress as a mediator. The effect of program on distress can also be estimated from the last two pathways, leaving out pathway Z. Pathway D shows the direct effect of the program on distress.

Study design

The study was conducted in Rangpur, Nilphamari and Kurigram, 3 northern districts of Bangladesh where the CFPR-TUP program began operating through its 38 Area

Offices in 2002. The program selected households through a multistage selection process, based on the socio-economic characteristics and availability of women eligible of earning income. The women of the selected households received income earning assets, subsistence allowance, and training on basic entrepreneurial skills. The program closely supervised the income generating activities of each woman for a grant phase of 18 months after which the participant women expected to have graduated from the CFPR-TUP program and joined the conventional BRAC micro-credit program. More than half of the women did join the regular BRAC program while all of them continued with their savings with BRAC that they started since joining the program.

In 2002 (i.e., baseline) BRAC collected data on demographic, socio-economic, and multiple other sets of variables from one third of randomly selected villages from each of its 38 Area Offices. Respondents of our study (i.e., surveyed in 2006) were women from 27 villages out of 16 Area Offices, randomly selected from the baseline village list of 446. Both at baseline and in 2006, all women who participated in the program and an approximately equal number of women from the control households of the selected villages were included in the study. Control households were initially selected by the program in 2002 but later excluded during the final selection process. The control (i.e., non-selected) households were therefore economically better off than the selected households based on the selection criteria. After the program's grant phase was over, the program households remained different from the control households in a way that more than 70% of the women were likely to have participated in the regular BRAC program (Sulaiman, Matin et al. 2006). Owing to this difference between groups, and the availability of baseline data, our study is essentially a non-equivalent control group pre- and post-test quasi-experimental design.

Sample size and data collection procedure

A total of 209 women were surveyed, of which 110 were from the program households (i.e., program participant) and 99 from the control households. The women from the control households were selected to be the wives of the household heads or the most influential women in a specific household. Data were collected on household demography, subjective wellbeing, domestic violence, food insecurity, perceived economy, emotional social constraints, and distress during July-September 2006. The demographic variables include age, number of children, household size, marital status, respondent's education status, major source of household income, and respondent's involvement in income generating activities. Baseline (i.e., 2002) demographic, economic, and food insecurity data were created in a separate dataset and merged to 2006 data. Furthermore, we merged data on household economic status that was collected during a program evaluation survey in 2005.

Data from 2006 for this study were collected as part of a data collection for a larger survey. A total of 24 interviewers collected data in 12 groups using 3 different pre-tested survey forms. The interviewers were selected from a pool of 30 female university graduates who went through the entire phase of training. Training was provided for five weeks by a team of 3 field research experts led by the principal investigator.

The training was designed to have two field trainings sandwiched between three classroom trainings. A day-long refresher training was also provided at a field office after the interviewers were sent to test data collection for a day on the actual program households that were not participating in the research.

The training and the data collection was performed in two groups. The first group consisted of 6 sub-groups, each having 2 interviewers. This group was responsible for surveying forms on demography, perceived economy, food insecurity, and emotional social constraints. The second group consisted of 3 sub-groups. A total of 6 anthropologists, specially trained to collect data on domestic violence and distress, were equally assigned to the sub-groups. The subjective wellbeing form was surveyed by an individual anthropologist.

Three Supervisors and a Field Manager, highly experienced in conducting surveys, monitored all field activities. The Principal Investigator (PI) and the Field Manager frequently visited several data collection sites everyday to ensure quality of the data. The interviewers communicated with the Field Manager or the PI through cellular telephones instantly in case of any problem at the field.

Informed consent was obtained from each respondent prior to interviews. The study protocol was approved by Bangladesh Medical Research Council, Dhaka, Bangladesh and University Committee on Human Subjects, Cornell University, USA.

Data entry and preliminary cleaning was done by data entry specialist at Research and Evaluation Division of BRAC. Further cleaning was done by the investigators.

Measurement of variables

All instruments had been tested for applicability in rural areas of Bangladesh prior to data collection. To test for reliability and to validate that the items had well-grounded construction, its performance is consistent with understanding and measures with precision, dependability, and accuracy each questionnaire was administered on a sub-

sample of 30 program participants (Marks, Habicht et al. 1989). A preliminary questionnaire was drafted after making necessary changes. Further inputs were incorporated during training of the interviewers.

Subjective wellbeing: Subjective wellbeing is defined as a broad domain involving a number of separable components such as life satisfaction, satisfaction with important domains of life, positive affects (i.e., experiencing pleasant emotion and moods), and low levels of negative affects (i.e., experiencing unpleasant emotion and moods) (Diener 2000; Diener and Oishi 2002). This research included only the affective components of the subjective wellbeing using Positive Affect and Negative Affect Schedule (PANAS) (Watson, Clark et al. 1988). Subjects were asked to rank their status in a 5-point Likert scale ranging from 1 to 5. We reverse coded the 10 Negative Affects (NA) items and added them to 10 Positive Affects (PA) items to make a composite scale ranging from 1 to 100. The Cronbach's alpha coefficient for test of reliability of PANAS was 0.79.

Economic status: We used End-Decade Multiple Indicator Survey Manual created based on the Multiple Indicator Cluster Study to create composite economic status scales out of multiple variables that were collected at baseline and in 2005 (UNICEF 2000). Variables were used in groups or as single items depending on the type and weight, and the availability of data (more detailed description of how the variables were created is available in the method section of Chapter 3). Each of the final variables, i.e., economic status of 2002 and 2005 created were summations of standardized scores of the sub-groups.

Perceived economy was measured in 2006 with a single response measure asking the respondents to rank their economic status in last 1 year on a 4 point scale that ranged from always deficit to surplus. Higher values of all measures of economic status represented economically better off households.

Food insecurity: Food insecurity is the limited or uncertain availability of nutritionally adequate and safe foods or limited or uncertain ability to acquire food in socially acceptable ways (Bickel, Nord et al. 2000). A two-item questionnaire was available from the baseline data to measure household food insecurity where women were asked to rate their food deficit in last one year, and whether the household could ensure at least two meals a day. Household food insecurity in 2006 was measured using a standard pre-tested 11-item module developed to measure food insecurity in rural Bangladesh (Frongillo, Chowdhury et al. 2003). We standardized the responses for each question and added them to form a composite score of household food insecurity. The z-score ranged from -33.20 to 12.90, a higher score indicating more food insecurity.

Emotional social constraints: A three-item tool used to measure emotional social support in rural Burkina Faso was adapted and used in this study (Nanama 2005). Women were asked about the likelihood of having someone to share her unhappy feelings with, getting effective emotional support from someone living closer to her, and the likelihood of getting advice in crisis. Each item was given a score, reverse coded, then added up to form a scale of emotional social constraints. A higher value represented lower support.

Domestic violence: Domestic violence against women is defined as any act or omission by a family member, regardless of the physical location where the act takes place, which negatively affects the well being, physical or psychological integrity, freedom or right to full development of a woman (WHO 2000). We measured domestic violence using guideline provided by World Health Organization (Ellsberg and Heise 2005). This questionnaire was used by International Centre for Diarrhoeal Diseases Research, Bangladesh (ICDDR,B) on rural Bangladeshi women (Naved, Azim et al. 2002). Information was collected on four different categories of violence: restriction of mobility or socialization or both, psychological oppression, physical assault with or without visible injury, and sexual abuse. For each category, respondents were asked whether or not they had experienced certain types of violence within last one year regardless of the person who was responsible for it. All positive responses were added up to make a scale for that specific category. Summation of all 18 items were also used to make a final scale representing the magnitude of cumulated experience of violence. The Cronbach's alpha reliability coefficient for the scale was 0.87. Similar statistical procedures were followed to construct the variable representing violence during pregnancy. This scale had a Cronbach's alpha reliability coefficient of 0.90. In both measures a higher score indicated experiencing more violence.

Distress: Distress is the negative cognitive appraisal of acute or chronic stress. We measured distress using World Health Organization (WHO) Self Reporting Questionnaire (SRQ-20) which has been previously tested and applied in rural Bangladesh context (Beusenberg and Orley 1994). A scale of 0-20 was used in the analysis where higher score referred to high level of distress.

Control measures

Analyses were controlled for individual and household level covariates measured at baseline and in 2006. Baseline measures used as covariates were number of children, household size, food insecurity, and economic status. Data on age, marital status, respondents' education, husband's education, household main source of income, and involvement in income generating activities were collected in 2006. Age, number of children, household size, measures of food insecurity and economic status were used as continuous variables while rest were used as categorical variables. Theoretically, husband's education, IGA and pregnancy status were important control variables for the relevant outcomes. These items had many missing data and when we included in the analysis, they had no influence on the results. These variables were therefore removed from the final analyses.

Statistical analysis

All outcome variables were tested for normality. Economic status scales made out of baseline and 2005 data showed nonnormal distributions. Logarithmic transformations were used to create scales of normal distribution. Transformed scales were used in multilevel analyses.

Linear mixed (random-intercept) models were used to account for the clustering affect of districts, Area Offices, and villages in measuring the effect of the program on wellbeing, distress and the stressors. Area Office and villages were used as random-effect variables in the models. District was used as a fixed-effect variable. All covariates including baseline food insecurity and economic status were also included as fixed-effect variables in the models.

The regression coefficients from the mixed-model analyses were used in the path analyses. The magnitude of effect through each path (i.e., indirect effects) was computed by multiplying all regression coefficients along the path (Wonnacott and Wonnacott 1990). The resultant coefficients of a set of paths (i.e., program's effect through multiple stressors) were added up to show the cumulative effect of the program through stressors.

In the analyses, we controlled for variables that could have potentially influenced the outcome measures. For example, stressors were included in the model as fixed effects in determining effect of the program on distress. Similarly, distress was added along with all stressors in estimating the effect of program on wellbeing.

The model that was used to determine estimates of different pathways is shown below with outcome distress as an example. The abbreviations of EC02, EC05, and FI02 are economic status at baseline, economic status in 2005, and baseline food insecurity respectively. The model estimating the effect of the program on economic status of 2005, obviously excluded EC05 from the right hand side of the equation. Table 5.1 shows the variables that were controlled in estimating each pathway (Figure 5.1).

$$Y_{iva} = \beta_{0i} + \beta_{1i}\, Program_{iva} + \beta_{2i}\, District + \beta_{3i}\, covariates_{iva} + \beta_{4i}\, EC02_{iva}$$
$$+ \beta_{5i}\, EC05_{iva} + \beta_{6i}\, FI02_{iva} + \beta_{7i}\, Stressors_{iva} + u_a + u_{v|a} + \varepsilon_{iva}$$

Y_{iva} refers to the response measures of outcome variables while subscripts i, v and a, denotes individual, village and area levels respectively. The random effect associated with the intercept for area is represented by u_a, the random effect associated with the intercept for village within area is represented by $u_{v/a}$, and the residual is denoted by

ε_{iva}. Baseline food insecurity and economic status were used for their lag effects allowing us to use temporality to get a more precise estimation of causal relationships between them and the outcome variables.

Table 5.1: Fixed effect variables used in different models to estimate the pathways

Pathway/s	Fixed effect variables
A and X	Program, District, EC02, FI02, EC05, covariates
A_2	Program, District, EC02, FI02, covariates
B, C and Z	Program, District, EC02, FI02, EC05, covariates, all stressors, Distress
D and Y	Program, District, EC02, FI02, EC05, covariates, all stressors

EC02, EC05 and FI02 represents economic status in 2002 and 2005, and food insecurity in 2002 repectively

All analysis were performed using the Statistical Package for Social Sciences (SPSS WIN 15).

RESULTS

The possible indirect pathways through which the program may affect distress are combinations of economic status-2005 and other stressors, i.e., domestic violence, food insecurity, perceived economy, and social constraints (Figure 5.2). The indirect pathways from program to wellbeing further include distress as a mediating factor.
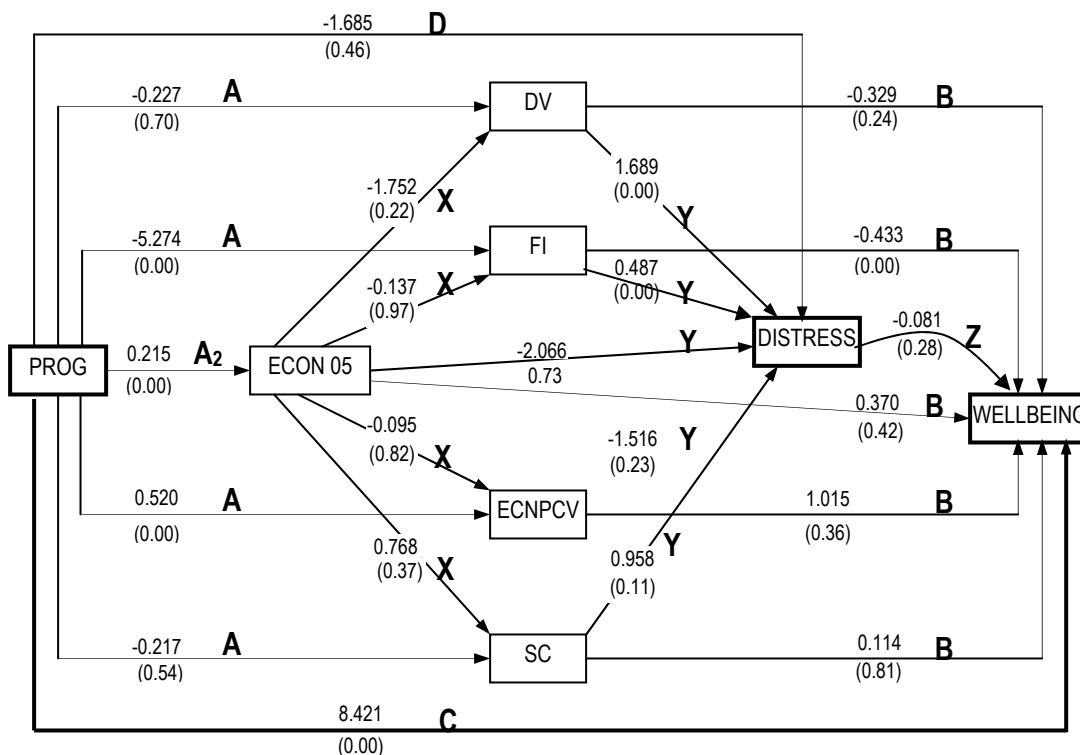
Figure 5.2: Pathways through which CFPR-TUP program affects distress and wellbeing showing regression coefficients and p-values (in parenthesis). The analysis was controlled for 2006 measures of women's age, marital status, and education, and main source of household income, and baseline (i.e., 2002) measures of household size, number of children, and food insecurity and economic status.

The indirect effects of CFPR-TUP program on distress follow two sets of pathways differentiated by whether or not economic status-2005 is included in the path as a predecessor of the other stressors. The indirect effects of the program through stressors when economic status-2005 was not in the pathways (-4.392) was larger than when it was in the pathways (-0.436) (Table 5.2). Food insecurity was by far the most pronounced mediator, with about half (52.9%) of the total indirect effect being mediated by food insecurity through a path that did not include economic status-2005.

Table 5.2: Estimates of paths illustrated in Figure 5.2 and the magnitude of indirect effects of the program on distress.

Intermediary variable	Paths				Indirect effects through mediators	
	A (β)	A_2 (β)	X (β)	Y (β)	Not including economic status-2005 $(A*Y)$	Including economic status-2005 (A_2*X*Y)
Domestic violence	-0.227	0.215	-1.752	1.689	-0.383	-0.636
Food insecurity	-5.274	0.215	-0.137	0.487	-2.568	-0.014
Economic status-2005	0.215	0.215	-	-2.066	-0.444	-
Perceived economy-2006	0.520	0.215	-0.095	-1.516	-0.789	0.031
Social constraints	-0.217	0.215	0.768	0.958	-0.208	0.158
				Total indirect effect	-4.392	-0.461

Both the direct and indirect pathways from program to distress were negative. About three-quarters (74.3%) of the total program effect on distress was exerted through indirect pathways (Table 5.3). About two-thirds (67.2%) of the total program effect was exerted through pathways that did not include economic status-2005.

Table 5.3: Magnitude and percentage of contribution of direct and indirect effects of the program on distress.

Effect of the program	Estimates	Contribution (%)
Indirect through mediators		
Not including economic status-2005 $(A*Y)$	-4.392	67.2
Including economic status-2005 (A_2*X*Y)	-0.461	7.1
Direct (D)	-1.685	25.8
Total effect	-6.538	100

Pathways as illustrated in Figure 5.2 are shown in parenthesis

The effects of the CFPR-TUP program on wellbeing was mediated through five sets of indirect pathways differentiated by whether or not economic status-2005 and distress were in the pathways. The largest indirect effects on wellbeing were mediated through the stressors (i.e., with a magnitude of 2.941) when neither economic status-2005 nor distress was included in the path (Table 5.4). As with distress, food insecurity was by far the most pronounced mediator, with about two-thirds (65.8%) of the total indirect effect being mediated by food insecurity through the path that included neither economic status-2005 nor distress.

Table 5.4: Estimates of paths illustrated in Figure 5.2 and magnitude of indirect effect of the program on wellbeing

Intermediary variable	Paths						Indirect effects through mediators			
	A (β)	A_2 (β)	X (β)	Y (β)	B (β)	Z (β)	Not including economic status-2005 and distress $(A*B)$	Including economic status-2005 but not distress (A_2*X*B)	Including distress but not economic status-2005 $(A*Y*Z)$	Including economic status-2005 and distress $(A_2*X*Y*Z)$
Domestic violence	-0.227	0.215	-1.752	1.689	-0.329	-0.081	0.075	0.124	0.031	0.052
Food insecurity	-5.274	0.215	-0.137	0.487	-0.433	-0.081	2.284	0.013	0.208	0.001
Economic status-2005	0.215	0.215	-	-2.066	0.370	-0.081	0.080	-	0.036	-
Perceived economy-2006	0.520	0.215	-0.095	-1.516	1.015	-0.081	0.528	-0.021	0.064	-0.003
Social constraints	-0.217	0.215	0.768	0.958	0.114	-0.081	-0.025	0.019	0.017	-0.013
				Total indirect effect			2.941	0.135	0.356	0.037

All direct and indirect pathways from program to wellbeing were positive. In contrast to distress, only 30% the total program effect on wellbeing was exerted through indirect pathways (Table 5.5). That is, 70% of the effect was direct from program to wellbeing.

Table 5.5: Magnitude and percentage of contribution of direct and indirect effects of the program on wellbeing.

Effect of the program	Estimates	Contribution (%)
Indirect through mediators		
Not including economic status-2005 and distress (A*B)	2.941	24.5
Including economic status 2005 but not distress (A$_2$*X*B)	0.135	1.1
Including distress but not economic status-2005 (A*Y*Z)	0.356	3.0
Including economic status 2005 and distress (A$_2$*X*Y*Z)	0.037	0.3
Indirect through distress only (D*Z)	0.137	1.1
Direct (C)	8.421	70.0
Total effect	12.027	100.00

Pathways as illustrated in Figure 5.2 are shown in parenthesis

DISCUSSION

The purpose of this study was to investigate how the CFPR-TUP program exerts its effects on distress and wellbeing. About three-quarters of the effect of the program on distress was explained by the indirect pathways through stressors. In contrast, less than one-third of the effect of the program in improving wellbeing was explained by the indirect pathways. We also found that much of the indirect effect of the program on both distress and wellbeing is mediated through food insecurity.

These results of the effect of the program on distress are consistent with the stress-suppressing model, a deterring model of the life-stress process, where the resource (i.e., program) serves to reduce the exposure to stressful conditions and thereby reduces experiencing negative consequences of stress exposure, e.g., distress (Ensel and Lin 1991). Disadvantaged ultra-poor women are more likely to be exposed to such stressful life conditions due to the failure of eliminating or modifying conditions

leading to stress or due to the lack of ability to cope with the adverse situation owing to resource constraints (Pearlin and Aneshensel 1986). Our conceptual framework (Figure 5.1) included domestic violence, food insecurity, measured economic status, perceived economy, and social constraints as five stressors that we thought were important in the context of extreme poor households in rural Bangladesh. The program reduced each of these stressors, and in turn the stressors reduced distress consistent with the stress-suppressing model (Table 5.2).

Studies show that in poor populations, subjective wellbeing has a high association with income such that a small raise in income brings a considerable change in their livelihood (Douthitt, MacDonald et al. 1992; Diener and Diener 1995a; Diener and Oishi 2000). We found that economic status in this extreme poor population had a positive but small effect on subjective wellbeing.

The fact that about 30% of the program's effect on wellbeing was mediated through stressors indicates that part of the benefit of the program in human terms is through alleviating stressful conditions of life. The larger direct effect (70%) of the program on wellbeing must be explained outside of the stress-suppressing model. The most likely explanation lies in the economic benefit and gaining assets for continuing income generating activities through which they built self confidence and self-awareness, and program benefits such as health care, legal support, organizational and elite support in the village, leading to more socialization.

Food insecurity was by far the most important mediator of program effects on distress and wellbeing. This may be explained by the fact that poorer households allocate the largest share of their expenditures in acquiring food, and concerns about securing food

predisposes to distress. Participating in the income generating activities lessens the concerns about acquiring food. The most likely mechanism to achieve this could be increased access to the local financial markets as part of the income generating process (Zeller, Schrieder et al. 1997).

This paper aimed to understand how a program targeted to extreme poor populations improved quality of life as measured by distress and subjective wellbeing. The results support the applicability and usefulness of the stress-suppressing model to explain the mechanisms of the program's effects. The results demonstrate that the program reduced exposure to stressors and in turn reduced distress. The program also improved subjective wellbeing partially through the stress-reduction pathways but mostly through other pathways that were not measured. That the results are consistent with this theoretical model lends further plausibility to the conclusion that the program improves the quality of life of its participants. The emergence of household food insecurity as the most important mediator provides further support to its salience in understanding the lives of poor people in this context and therefore the need to assess it.

REFERENCES

Ameen, F. and M. Sulaiman (2006). Social Capital and Economic Well-being. CFPR/TUP Working Paper Series No. 15. Dhaka and Ottawa, BRAC and Aga Khan Foundation Canada.

Beusenberg, M. and J. Orley (1994). A User's Guide to the Self Reporting Questionnaire (SRQ). Geneva, Division of Mental Health, World Health Organization.

Bickel, G., M. Nord, et al. (2000). Guide to Measuring Household Food Security: Revised 2000. No. 6. March 2000, U.S. Department of Agriculture, Food and Nutrition Service, Alexandria VA.

BRAC-RED (2004). Stories of Targeting: Process Documentation of Selecting the Ultra Poor for CFPR/TUP Programme. CFPR/TUP Working Paper Series No. 1. Dhaka and Ottawa, BRAC and Aga Khan Foundation Canada.

Diener, E. (2000). "Subjective Well-Being: The Science of Happiness and a Proposal for National Index." The American Psychologist 55(1): 34-43.

Diener, E. and C. Diener (1995a). "The Wealth of Nations Revisited: Income and Quality of Life." Social Indicators Research 36: 653-663.

Diener, E. and S. Oishi (2000). Money and Happiness: Income and Subjective Wellbeing Across Nations. Cambridge, MA, The MIT Press.

Diener, E. and S. Oishi (2002). Subjective Wellbeing, Oxford University Press, US.

Douthitt, R. A., M. MacDonald, et al. (1992). "The Relationship Between Measures of Subjective Wellbeing and Economic Wellbeing: A New Look." Social Indicators Research 26: 407-422.

Ellsberg, M. and L. Heise (2005). Researching Violence Against Women: A Practical Guide for Researchers and Activists Washington DC, United States, World Health Organization, PATH.

Ensel, W. M. and N. Lin (1991). "The Life Stress Paradigm and Psychological Distress." Journal of Health and Social Behavior **32**(4): 321-341.

Frongillo, E. A., N. Chowdhury, et al. (2003). "Understanding the experience of household food insecurity in rural Bangladesh leads to a measure different from that used in other countries." J Nutr **133**(12): 4158-62.

Lazarus, R. S. and S. Folkman (1984). Stress Appraisal and Coping. New York, Springer Publishing.

Marks, G. C., J.-P. Habicht, et al. (1989). "Reliability, dependability, and precision of anthropometric measurements. The Second National Health and Nutrition Examination Survey 1976-1980." American Journal of Epidemiology **130** 578-587.

Matin, I. and S. R. Halder (2004). Combining Methodologies for Better Targeting of the Extreme Poor: Lessons from BRAC's CFPR/TUP Programme. Working Paper No. 2. Dhaka and Ottawa, BRAC and Aga Khan Foundation Canada.

Matin, I. and D. Hulme (2003). "Programs for the Poorest: Learning from the IGVGD Programme in Bangladesh." World Development **31**(3): 647–65.

Morduch, J. and B. Haley (2001). Analysis of the Effects of Microfinance on Poverty Reduction. NYU Wagner Working Paper. No. 1014, New York University.

Mroczek, D. K. and C. M. Kolarz (1998). "The Effect of Age on Positive and Negative Affect: A Developmental Perspective on Happiness." Journal of Personality and Social Psychology **75**(5): 1333-1349.

Nanama, S. (2005). Experience, Trends, and Consequences of Food Insecurity in Complex Households in Rural Burkina Faso. Division of Nutritional Sciences. Ithaca, Cornell Univeristy. **PhD:** 136.

Naved, R. T., S. Azim, et al. (2002). "Women's Health and Domestic Violence Against women in Bangladesh. A report submitted to UPHCP-ADB, Dhaka."

Pearlin, L. I. (1982). The Social Context of Stress. Handbook of Stress. L. Goldberger and S. Breznitz. New York, Free Press**:** 303-315.

Pearlin, L. I. and C. Aneshensel (1986). Coping and Social Supports: Their Function and Applications. New Brunswick, NJ, Rutgers University Press.

Repetti, R. L. and J. Wood (1997). Families Accommodating to Chronic Stress. Coping with Chronic Stress. G. B. H. New York, Plenum Press: 191-220.

Serido, J., D. M. Almeida, et al. (2004). "Chronic Stressors and Daily Hassles: Unique and Interactive Relationships with Psychological Distress." Journal of health and Social Behavior **45**(1): 17-33.

Sulaiman, M. and I. Matin (2006). Targeting Effectiveness of CFPR/TUP in Scale-up Environment. CFPR/TUP Working Paper Series No. 8. Dhaka and Ottawa, BRAC and Aga Khan Foundation Canada.

Sulaiman, M., I. Matin, et al. (2006). Microfinance Engagements of the 'Graduated' TUP Members. CFPR/TUP Working Paper Series No. 9. Dhaka and Ottawa, BRAC and Aga Khan Foundation Canada.

UNICEF (2000). Monitoring Progress Toward The Goals Of The World Summit For Children: End-Decade Multiple Indicator Survey Manual. New York, Division of Evaluation, Policy and Planning Programme Division, United Nations Children's Fund

Watson, D., L. A. Clark, et al. (1988). "Development and Validation of Brief Measures of Positive and Negative Affect: The PANAS Scales." Journal of Personality and Social Psychology **54**(6): 1063-70.

WHO (2000). "World Report on Violence and Health ".

Wonnacott, T. H. and R. J. Wonnacott (1990). Introductory Statistics for Business and Economics, John Wiley and Sons Inc.

Zeller, M., G. Schrieder, et al. (1997). Rural finance for food security of the poor: Implications for research and policy. Washington DC. , International Food Policy Research Institute (IFPRI)

CHAPTER SIX

CONCLUSIONS AND IMPLICATIONS

The main findings

The CFPR-TUP program improved measured and perceived economic status, and wellbeing, and reduced food insecurity, domestic violence, and distress. The program also improved the nutritional status (i.e., weight-for-height) of children between age 24-35 months. Investigating how the program brings about the changes in participant women's distress and wellbeing, we found that three-quarter of the effect of the program on distress and approximately one-third of the effect on wellbeing were mediated through stressors. Food insecurity by far was the most important mediator of these effects. Although the program did have positive effect on these outcomes, we found no effect of the program on other outcomes: child discipline, parental role in early childhood learning, emotional social constraints, and nutritional status of women of extreme poor households.

Programmatic implication for BRAC

This research has been funded by the Research and Evaluation Division of BRAC with a view to provide useful information to the BRAC policy makers about the impact of the program on outcomes which otherwise would not have been examined. Overall, we showed that the CFPR-TUP program has been successful in accomplishing the main mission of BRAC, by bringing about positive changes in the quality of lives of the extreme poor.

Using non-equivalent control group pre- and post-test quasi-experimental design we achieved the findings listed above and further supported some of the findings of the

existing literature on the effects of the CFPR-TUP program on improved economic status and decreased food insecurity by using a different analytical approach that accounted for district and Area Office level variability. The variability at the Area Office and village level suggests that this issue should be taken into account in research involved in quantitative evaluation of the program.

Our investigations showed that the families that were economically worse off at baseline (i.e., 2002) were most likely to benefit from the program in outcomes for which the program was shown to have an effect. This suggests that the program's effect is dependent upon the initial status of the participating households. Therefore, programs with more effective targeting mechanism will bring more success with relatively less effort.

The reduction in domestic violence may have been the reflection of the program's achievement in empowering the women of the extremely poor households by providing them with a regular source of income, and legal, social, and institutional support. Related to this is the level of distress that the participating women experienced. In Chapter Five we showed that domestic violence, a stressor, significantly reduced distress. The effect of the program on distress, however, is weakly mediated through domestic violence.

One of the key messages from the Lancet maternal and child nutrition series was that stunting (i.e., height-for-age), severe wasting (i.e., weight-for-height), and intrauterine growth restriction were responsible for about 21% of disability-adjusted-life-years (DALYs), a measure of future productivity. The findings of our research suggest that the program's long-term impact lies on improving the nutritional status of children

who were in utero or born during the active implementation phase of the program. This adds to BRAC's mission of bringing about change in the national and global poverty reduction and social progress (BRAC 2007).

Food insecurity has been shown to be the key mediator of the indirect effect of the program both on distress and wellbeing, and the program significantly reduced food insecurity. Knowing this mediating effect of food insecurity and that the program can have such effect on the other outcomes mentioned in this dissertation, we can ask if the impact is already sufficient? Is there anything more that needs to be done to potentiate the effect of the program on those outcomes? Are there specific interventions that might help in addition to the current intervention? What are the costs that BRAC might want to think about trade offs of investing on poverty alleviation versus investing more on the other issues? These may be answered by further research.

Scientific implication of this research

The overall learning from this study that adds to our scientific knowledge is that the program aiming at poverty reduction does improve the lives of the poor beyond economic terms and improves the overall quality of life provided that the program is well-targeted, monitored, and implemented. We also learned that the effect of the program on certain outcomes does depend of their initial status.

Such an effective program does improve the nutritional status of children of poorest of the poor households who were exposed to the program at the beginning of their lives or were in utero. The impact of the program on nutritional status, however, is not immediate and is expressed after a lag period. Also, the program differentially affected the nutritional status of children of different age categories. This evidence is important

in the scientific evaluation of programs or interventions when nutritional status of preschool children is an outcome. This information should also be used in evaluating pregnancy outcomes. We argue that the improvement of the nutritional status was the effect of the program not only directly on the children, but also on pregnancy. Although we have not tested for this, but hypothetically we could argue that the mothers of the program households were nutritionally better (i.e., physical and biochemical) and had healthier pregnancy outcomes towards the end of program as they received benefit of the program for a longer time. Again, hypothetically, we can argue that the better pregnancy outcome was attributed not only to the better status in physical terms but also to the better psychological status and overall improvement in the overall quality of life (i.e., improved subjective wellbeing, lowered distress and domestic violence).

In contrast to the prior wellbeing literatures, we found that economic improvement of the poorest of the poor did not affect wellbeing significantly (Diener, Sandvik et al. 1993; Diener and Biswas-Diener 2002). Previous studies, however, were not done in such poor community or economic intervention setting. Also, those studies focused only on the effect of income on wellbeing. Our research was based on the global improvement of the lives of the ultra-poor where there are many other factors that brought wellbeing, not just the economic improvement.

Our findings are consistent with the stress-suppressing model (Ensel and Lin 1991). Although stressors explained more than three-quarters of the indirect effect of the program on distress, and explained about one-third of the effect of the program on wellbeing, lower distress did not necessarily mean improvement in wellbeing. So the

114

key message here is that an effective poverty reduction program reduces distress and improves wellbeing both by lowering stress level but also through other mechanisms.

This research provides powerful evidence that poverty is truly related to the outcomes that we have discussed so far. We proved that households that were economically worse off at the beginning of the program became better off in those outcome if they had participated in the program. We also argue that such findings takes us beyond cross-sectional studies or even beyond some longitudinal studies because we followed up those who participated in the program and after a lag period and assessed the change in comparison to a control group whose status in relation to the program group at baseline was understood. So it strengthens our understanding that poverty is really related to these aspects of quality of life.

REFERENCES

BRAC (2007). BRAC Annual Report 2006. Dhaka, BRAC.

Diener, E. and R. Biswas-Diener (2002). "Will money increase subjective well-being?" Social Indicators Research 57(2): 119.

Diener, E., E. Sandvik, et al. (1993). "The Relationship Between Income and Subjective Wellbeing: Relative or Absolute?" Social Indicators Research 28: 195-223.

Ensel, W. M. and N. Lin (1991). "The Life Stress Paradigm and Psychological Distress." Journal of Health and Social Behavior 32(4): 321-341.

APPENDIX

SURVEY INSTRUMENTS

<u>Positive and Negative Affect Scale</u>

No.	Item	Not at all	A little	Moderately	Quite a bit	Extremely
		1	2	3	4	5
1.	Interested					
2.	Distressed					
3.	Excited					
4.	Upset					
5.	Strong					
6.	Guilty					
7.	Scared					
8.	Hostile					
9.	Enthusiastic					
10.	Proud					
11.	Irritable					
12.	Alert					
13.	Ashamed					
14.	Inspired					
15.	Nervous					
16.	Determined					
17.	Attentive					
18.	Jittery					
19.	Active					
20.	Afraid					

<u>Satisfaction With Life Scale</u>

No.	Item	Do not agree	Neither agree nor disagree	Completely agree
		1	2	3
1	In most ways, my life is close to my ideal			
2	The conditions of my life are excellent			
3	I am satisfied with my life			
4	So far I have gotten the important things in my life			
5	If I could live my life over, I would change almost nothing			

Child discipline and parental role in early childhood learning

SUPPORT FOR LEARNING / STIMULATING ENVIRONMENT				
1. How many books are there in the house hold? (please include school books, but not other books meant for children such as picture books)				
2. I am interested in learning about the things that the child plays with when he/she is at home. What does the child play with? Please show me the things that your child play with.				
2.a	Household objects such as bowls, plates, cups or pots? (using 2-3 items)			Yes/No
2.b	Objects and materials which are found around the household, such as sticks, rocks, animals, shells, or leaves			Yes/No
2.c	Home made toys such as dolls, cars and other toys made at home?			Yes/No
2.d	Toys that came from a store			Yes/No
2.e	Toys that makes music/ musical instruments			Yes/No
2.f	Something to draw with			Yes/No
2.g	Children's picture book (except school books)			Yes/No
2.h	Blocks or bricks to build houses etc			Yes/No
2.i	Dresses that can be used to perform/role play/ disguise/			Yes/No
2.j	Toys that are used in games involving physical activities			Yes/No
2.k	Any toy that allows the child to make shapes or to helps knowing different colors			Yes/No
2.l	Others (note anything you think not mentioned by the respondent)			
3. In the past 3 days did you or any household member over 15 years of age engage in any of the following activities with the child? If yes, ask: who engaged in this activity with the child- the mother, the child's father or another adult member of the household (including the caretaker/respondent)?				
		Mother	Father	Other
3.a	Read books or look at picture books with	1	2	3
3.b	Tell stories to the child	1	2	3
3.c	Sing song to or with the child	1	2	3
3.d	Take the child outside the home compound, yard or enclosure	1	2	3
3.e	Play with the child	1	2	3
3.f	Spend time with the child naming counting and/or drawing things	1	2	3

CHILD DISCIPLINE MODULE		
4. Generally how do you react when the child does something which is not to your likings?		
Category A		
4.a1	Explain why something (the behavior) is wrong	Yes/No
4.a2	Give him/her something else to do or distract the child's attention from the source	Yes/No
4.a3	Take away privileges, forbid something the child liked (such as not allowed to play with a toy the child likes) or ground him or her (not allowed to leave house)	Yes/No
4.a4	Ask him/her to sit somewhere alone and quiet	Yes/No
4.a5	Others (please note)	
Category B		
4.b1	Scold, shout or screamed at him	Yes/No
4.b2	Pretend to beat him/her to intimidate	Yes/No
4.b3	Call the child dumb, lazy or another name like that	Yes/No
4.b4	Threaten to throw out of the home	Yes/No
4.b5	Others (please note)	
Category C		
4.c1	Beat him/her on the buttock with hand	Yes/No
4.c2	Slap him/her on the hand or legs/thigh	Yes/No
4.c3	Beat him/her on the buttock with something, such as stick	Yes/No
4.c4	Shake him/her	Yes/No
4.c5	Beat him/her on the other parts of the body (excluding buttock)	Yes/No
4.c6	Pinch	Yes/No
4.c7	Slap him/her on the face, head or on the ear	Yes/No
4.c8	Punch or kick	Yes/No
4.c9	Push him/her on the ground	Yes/No
4.c10	Beat up severely	Yes/No
4.c11	Chocked him/her	Yes/No
4.c12	Feel like burning him/her on the fire or steam	Yes/No
4.c13	Show knife, chopper etc to intimidate him/her	Yes/No

5. If the child really misbehaves, what reaction do you usually show?

If the mother replies, she beats up the child, you then ask her to say what she beats with and on which part of the body.

(Do not read out any of the following probable replies to the mother. Only mark the replies she gives)

Category A

5.a1	Explain why something (the behavior) is wrong	Yes/No
5.a2	Give him/her something else to do or distract the child's attention from the source	Yes/No
5.a3	Take away privileges, forbid something the child liked (such as not allowed to play with a toy the child likes) or ground him or her (not allowed to leave house)	Yes/No
5.a4	Ask him/her to sit somewhere alone and quiet	Yes/No
5.a5	Others (please note)	

Category B

5.b1	Scold, shout or screamed at him	Yes/No
5.b2	Pretend to beat him/her to intimidate	Yes/No
5.b3	Call the child dumb, lazy or another name like that	Yes/No
5.b4	Threaten to throw out of the home	Yes/No
5.b5	Others (please note)	

Category C

5.c1	Beat him/her on the buttock with hand	Yes/No
5.c2	Slap him/her on the hand or legs/thigh	Yes/No
5.c3	Beat him/her on the buttock with something, such as stick	Yes/No
5.c4	Shake him/her	Yes/No
5.c5	Beat him/her on the other parts of the body (excluding buttock)	Yes/No
5.c6	Pinch	Yes/No
5.c7	Slap him/her on the face, head or on the ear	Yes/No
5.c8	Punch or kick	Yes/No
5.c9	Push him/her on the ground	Yes/No
5.c10	Beat up severely	Yes/No
5.c11	Chocked him/her	Yes/No
5.c12	Feel like burning him/her on the fire or steam	Yes/No
5.c13	Show knife, chopper etc to intimidate him/her	Yes/No

CHILD CARE SITUATION

6	Do you believe that in order to bring up (raise, educate) your child properly, you need to physically punish him/her	1= Yes, 2=No, 3= Do not know
7	In the past week, how many times was the child left in the care of another child less than 10 years of age?	------ of times/week
8	In the past week how many times was the child left alone?	------ of times/week

Food insecurity

No.	Question	Code
1.	In the last 1 month, how many times has it happened that you couldn't eat two fulfilling meals?	0= Never 1= 1-2 times a week 2= 3-4 times a week 3= more than 5 times a week
2.	In the last 1 month, how often did you have rice only (with salt, onions, chili etc?)	0= Never 1= 1-2 times a week 2= 3-4 times a week 3= more than 5 times a week
3.	Has tonight's dinner been taken care of?	1=Yes 2=No, not sure *(If no, pls move to question 7.5)*
4.	How many nights in a month does this usually happen?	0= Never 1= 1-2 times a week 2= 3-4 times a week 3= more than 5 times a week
5.	Compared to other times, do you face food deficiency during *Kartik* (Oct-Nov)	1=No difference 2=Yes, a little (compromised food quality) 3=Yes (compromised both food quality and quantity)
6.	How often do you need to buy the following food? Rice -------------- days Fish/meat/vegetables etc. -------------- days	
7.	In the last 1 month, how many times have you had to borrow rice?	0= never 1= 1-2 times a month 2= 3-4 times a week 3= More than 5 times a week
8.	If you borrow, are you usually able to return it?	1=Yes 2=No, not sure 99= Not applicable
9.	In a regular week, how many times do you consume the following food items? Eggs ……………times Purchased Fish ……….... times Caught Fish ……………times Meat ………….. times Low-quality rice …………... times Free leafy vegetable ………….. times	
10.	To manage food for the family, do you often have to do anything that makes you feel stigmatized?	1=Yes 2=No, not sure
11.	Do feel guilty when your household is food deficit?	1=Yes 2=No, not sure
12.	What was your status in terms of availability of food in the household?	1=always deficit 2=deficit some times 3=Neither deficit nor surplus 4=Food surplus

Emotional social constraints

No.	Question	Code
1.	In case of an adverse situation or crisis how much do you hope you can coop with it and ultimately feel relieved?	0= Not at all; 1= May relieve a little; 2=May relieve completely
2.	In such adverse situations, talking to whom makes you feel better?	1= Someone at home; 2=Neighbor; 3= Someone in the village; 4= Someone outside village; 5=Fellow TUP member; 6= BRAC personnel; 7= Gram Shohayak Committee; 8=Someone from parent's house; 9=Any other person (please mention); 99=No one
3.	When you need advice, how much do you expect to get it from somewhere?	1= Not at all; 2=May get some, but not sufficient; 3=Sufficient

Distress
Self Reported Questionnaire (SRQ-20)

No.	Question	Code
1	Did you often have headaches?	Yes/No
2	Was your appetite poor?	Yes/No
3	Did you sleep well?	Yes/No
4	Were you easily frightened?	Yes/No
5	Did you have your hands tremble?	Yes/No
6	Did you feel nervous, tense or worried?	Yes/No
7	Was your digestion poor?	Yes/No
8	Did you have trouble thinking clearly?	Yes/No
9	Did you feel unhappy?	Yes/No
10	Did you cry more than usual?	Yes/No
11	Did you feel it difficult to enjoy your daily activities?	Yes/No
12	Did you find it difficult to make decisions?	Yes/No
13	Was your daily life suffering?	Yes/No
14	Were you unable to play a useful part in life?	Yes/No
15	Did you lose interest in things?	Yes/No
16	Did you feel of yourself as an worthless person?	Yes/No
17	Did you think of terminating your own life?	Yes/No
18	Did you feel tired all the time?	Yes/No
19	Did you have uncomfortable feelings in your stomach?	Yes/No
20	Were you easily tired?	Yes/No

Violence against women

People usually experience both good and bad moments in their lives. I would now like to ask you some questions about how you are treated by your husband or any other member of your family. If anyone interrupts us I will stop the conversation. I would like to assure you that your answers will be kept secret. You do not have to answer any questions that you do not want to. May I continue?

(No)..1 **(Stop interview)**

(Yes)..2

Section 1.

No.	Question	Code	If yes, who was responsible for such act (multiple answers accepted)
	Did your husband or any family member or anyone else from your husband's side treated you the following way/s	Yes/No	1=Husband; 2=other family member; 3= neighbors; 99=Not applicable
1	Restrict you to contact with your family of birth?		
2	Restrict you to contact with your friends and neighbors?		
3	Ignore you and treats you indifferently?		
4	Get angry if you speak with another man?		
5	Often shows suspicion that you are unfaithful?		

Section 2.

| No.	Question	Code	If yes, who was responsible for such act (multiple answers accepted)
	The next questions are also about things that happen to many women, and may have happened to you as well. Did your husband or any family member or anyone else from your husband's side treated you the following way/s	Yes/No	1=Husband; 2=other family member; 3= neighbors; 99=Not applicable
6	Has your husband or anyone else from your family ever insulted you or made you feel bad about yourself?		
7	Has your husband or anyone else from your family ever belittled or humiliated you in front of other people?		
8	Has your husband or anyone else from your family ever did things to scare or intimidate you on purpose (e.g. by the way he looked at you, by yelling and smashing things)?		
9	Has your husband or anyone else from your family ever threatened to hurt you or someone you care about?		
10	Has anyone of them ever pressurized you to bring money or other things or to get facilities from your natal family?		

Section 3.

No.	Question	Code	If yes, who was responsible for such act (multiple answers accepted)
	Did your husband or any family member or anyone else from your husband's side treated you the following way/s	Yes/No	1=Husband; 2=other family member; 3= neighbors; 99=Not applicable
11	Has your husband or anyone else from your family ever slapped you or threw something at you that could hurt you?		
12	Has anyone of them ever pushed you or shoved you?		
13	Has anyone of them ever hit you with his fist or with something else that could hurt you?		
14	Has anyone of them ever kicked you, dragged you or beat you up?		
15	Has anyone of them ever choked or burnt you on purpose?		
16	Has anyone of them ever used a knife, gun or other weapon against you?		
17	Has anyone of them ever kicked you, dragged you or beat you up?		

Section 4.

No.	Question	Code	If yes, who was responsible for such act (multiple answers accepted)
	Did your husband or anyone else treated you the following way/s?	0=Yes; 1=No	1=Husband; 2=other family member; 3= neighbors; 99=Not applicable
18	Have you ever been forced or pressurized to have sex or perform any sexual act against your will? *(Make sure that husband is taken into account)*		
19	Has any of the abuse you experienced led to any kind of injury like nicks, cuts, gashes, burns, broken bones, etc.?		
If the answer to question 4.11 to 4.18 is 'NO', please skip to section 5			

Section 5.

If any of signs of abuse are evident and there are negative responses to the screening questions, ask the following questions: It looks as if someone hurt you. Can you tell me how this happened?

----

 a) No sign = 0
  Sign of abuse present = 1

 b) Disclosed experience of violence = 1 (*If she discloses violence go back and ask all the questions* 12.11 to 12.18)
  Did not disclose experience of violence = 0 (*If she still refuses to disclose violence stop the interview.*)

Section 6.

CONCLUDING STATEMENT – IF RESPONDENT HAS DISCLOSED PROBLEMS/ VIOLENCE
I appreciate and thank you for the time that you have taken for answering the questions. I realize that these questions may have been difficult for you to answer. From what you have told us, I can tell that you have had some very difficult times in your life. No-one has the right to treat someone else in that way. However, I can see that you are strong, and have survived through some difficult circumstances.

CONCLUDING STATEMENT - IF RESPONDENT HAS NOT DISCLOSED PROBLEMS/ VIOLENCE
Thank you very much. I realize that these questions may have been difficult for you to answer. So, I appreciate the time that you have taken for answering the questions.