# Women's involvement in BRAC development activities and child nutrition

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## FOREWORD

Empirical evidence points to a causal relationship between the socioeconomic status of individuals and communities and their health. Indeed improvement in health is expected to follow socioeconomic development. Yet this hypothesis has rarely been tested; at least it has not undergone the scrutiny of scientific inquiry. Even less understood are the processes and mechanisms by which the changes are brought about.

The Rural Development Programme (RDP) of BRAC is a multisectoral integrated programme for poverty alleviation directed at women and the landless poor. It consists of mobilization of the poor, provision of non-formal education, skill training and income generation opportunities and credit facilities. The programme is the result of 20 years of experience through trial and error. However evaluation of its impact on human well-being including health has not been convincingly undertaken.

The Matlab field station of ICDDR,B is an area with a population of 200.000, half of whom are recipients of an intensive maternal and child health and family planning services. The entire population is part of the Center's demographic surveillance system where health and occasionally socioeconomic indicators have been collected prospectively since 1966.

A unique opportunity arose when BRAC decided to extent its field operations (RDP) to Matlab. ICDDR,B and BRAC joined hands to seize this golden occasion. A joint research project was designed to study the impact of BRAC's socioeconomic interventions on the well-being of the rural poor, especially of women and children, and to study the mechanism through which this impact is mediated.

In order to share the progress of the project and its early results, a working paper series has been initiated. This paper is an important addition in this endeavour. The project staff will appreciate critical comments from the readers.


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# Abstract

This study explores the effect of women's involvement in BRAC's income and health development activities on the nutritional status of their children aged 6-72 months. MUAC measurements of 1,518 children aged 6-72 months (using TALC) were taken between April-August 1995 under the BRAC-ICDDR,B joint research project in Matlab using a four-cell-study design. Data analysis consisted of both bivariate and multivariate analysis, along with comparison with similar data from a baseline survey done in 1992. Findings reveal that prevalence of severe PEM has decreased significantly from 23.2% to 14.1% among children of BRAC member households ($p<0.05$) during the period between 1992 and 1995. However, among non-member households, the prevalence remained almost unchanged (21.2%). The positive effect of women's involvement in BRAC development activities on their child's nutritional status remained significant even after controlling for age and sex of the child; age, year of schooling and number of living children of the mother; per capita monthly expenditure; MCHFP area; and four study cells during regression procedure. The children, whose mothers were participating in BRAC development activities, were 41% less likely to suffer from severe malnutrition compared to those of non-member ($p<0.05$). However, gender differential in the prevalence of severe malnutrition was very pronounced among the children of BRAC member households ($p<0.05$). This may, in part, be explained by the fact that BRAC does not have gender focused component in its programme. Programmatic implications of these findings are discussed.

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## Introduction

Nutritional deficiency remains one of the principal health problems in developing countries. In Bangladesh children suffer the worst form of malnutrition. According to World Bank report, four out of ten Bangladeshi babies are born with low birth weight; by the time of their second birthday, nine out ten children become malnourished and six out of ten children under five suffer from moderate to severe malnutrition [1]. It is widely recognised that the immediate determinants of child development and nutrition are food intake and health status [2]. Since women in all parts of the world traditionally have major responsibility for feeding and caring for children, their socio-economic condition is a vital determinant of food intake, health and nutrition of the children [3]. There are some evidences that the income earned by a woman and her control over household resources greatly ensure adequate food consumption and use of available funds for the direct benefit of her children [4,5]. The present study aims at evaluating the impact of women's involvement in BRAC's income and health development activities on their children's nutritional status.

BRAC's development programmes in brief

BRAC is one of the largest non-governmental organisations (NGO) with its multisectoral programmes targeted to the poorest of the poor with special emphasis on women and children. RDP (Rural Development Programme) is a major integrated development programme of BRAC aiming at poverty alleviation and empowerment of the rural poor. Different development interventions of RDP include institution building (village based organisation), provision of credit and savings, small holder of livestock and fisheries, income generation for vulnerable group development (IGVGD) and the rural enterprise project. RDP has organised over 2.2 million poor landless people into 62,000 groups called village organisation (VO). Currently 95% these VOs are women. RDP also provides functional education, skill and human development training, Human Rights and Legal Education (HRLE) for female participants to make them aware of their own social problems and increase their capability to secure their legal and civil rights. BRAC also provides Non Formal Primary Education (NFPE) for those children, who do not attend or have dropped out from government schools. Currently there are 35,000 NFPE schools run by BRAC and 70% of these school children are girls and 96% of the teachers are women recruited from the perspective villages. Another major component of RDP is Essential Health Care Service (ESC), through which BRAC promotes the use of safe water, sanitation, and health and nutrition education in addition to immunisation facilities, family planning and basic curative services for common diseases. These services are delivered by the community female health workers through home visits [6,7].

Inception of BRAC in Matlab

During early 1992, BRAC extended its comprehensive Rural Development Programme (RDP) to 100 villages of Matlab where ICDDR,B has been involved in demographic monitoring and health interventions since 1960s. The availability of ICDDR,B baseline data on the population provides a unique opportunity for longitudinal research on the relationships between socio-economic development and health and well being. ICDDR,B and BRAC decided to avail this opportunity and carried out a collaborative research project in Matlab. As a part of this joint undertaking, BRAC aimed to study the impact of RDP on health and well-being, particularly of women and children and the mechanism of changes, if any (BRAC & ICDDR,B, 1994: 5-6). Using this research project data, this paper aimed to assess the extent to which RDP of BRAC has been successful in improving nutritional status of the children whose mothers participated in the development programmes of BRAC. It is important to note that, this study will assess 3 years impact of RDP activities from the start of the programme in 1992 to the date of data collection in 1995. During this 3 year period, except for Human Rights and Legal Education (HRLE) all other component of RDP was in operation.

**Methodology**

The project began with a baseline survey in 60 villages in 1992 (before inception of BRAC in Matlab) and information on health, nutrition, income, employment, women status, literacy and other variables were collected. In 1995, three years after the initiation of the project, three rounds of seasonal surveys were carried out to monitor changes in selected indicators including nutritional status of the programme participants. A four cell study design was instituted for these seasonal surveys. 14 villages were purposively sampled from the 60 villages. Out of 14 villages, five had both BRAC-ICDDR,B interventions, five had only BRAC, two had only ICDDR,B and two had neither. In Matlab, an embankment (the Meghna-Dhonagoda) was constructed to protect the area from seasonal floods, which categorised the study population according to the location of the villages inside or outside the embankment. The household survey covered approximately 3500 households in each round. For Anthropometric survey, only a sub-sample of 2076 were randomly selected (approximately 520 from each cell). This study used both the baseline and 1st round of seasonal survey data in order to measure the changes during pre and post intervention period.

The Anthropometric measurements were taken on all household members aged 6 months and above. The individual who had deformities in leg or spine was excluded from the Anthropometric survey. Body weight was measured to the nearest 100g using saltier scale for children. Standing height was measured using a special wooden height board made by ICDDR,B. Mid upper arm Circumference (MUAC) was measured using MUAC tape (TALC, Teaching Aids Low Cost, St. Albans, England).

Several measures were taken to ensure the quality of the data. The instruments were checked each day before going to the field by the interviewers and team supervisor to ensure the corrections of the data. A separate quality control team resurveyed 5% of the households and the main survey data were cross-checked with the re-survey teams' findings in order to determine the validity of the large survey.

The subjects of this study were children aged 6 to 72 months. Data of 1,518 children were available for analysis. However, when nutrition data were merged with other data from household economic survey, total sample of some variables varied due to missing data.

In this study, MUAC of these children was chosen as a dependent variable. Per capita (adult equivalent) monthly total expenditure and sex of the household head were used as a proxy of socio-economic indicators. Maternal age, year of schooling, along with mothers parity[1] were used as maternal factors; and sex and age of the child were used as individual characteristics which are likely to be associated with the state of a child's nutrition [8,9].

Women's involvement in BRAC development activities was expressed as BRAC membership. Length of membership in month; loan size; type of membership categorised as, member who have only savings, member who have both savings and credit and who have savings, credit and training were used as development input variables which are expected to have influence on the nutritional status.

Strength of MUAC measurement to determine nutritional status

The mid-upper arm circumference (MUAC) gives rough estimates of protein (muscle) and energy (subcutaneous fat) stores, which correlate approximately with changes in body weight in malnourished

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[1] *Total number of living children was taken as a proxy indicator of mothers' parity.*

children [10]. MUAC was chosen as the indicator of nutritional status because it compares favourably with other Anthropometric indices for the assessment of the risk of mortality among children. A recent report suggests that nutritional screening is more accurate when the risk of death is assessed over a short period of time. It was concluded that children who would die within one month of screening could be identified with 94% specificity and 56% sensitivity-- almost twice the sensitivity achieved by the other Anthropometric indicators for this level of specificity [11]. MUAC is now being increasingly used in identifying children with protein energy malnutrition (PEM) [12]. Also, from Matlab data, MUAC measurements were found more precise and accurate at a field setting compared to other Anthropometric measurements.

To measure the nutritional status, children were classified into the following levels of nutritional status: severe or third degree PEM represented by MUAC less than 125 mm.; moderate or second degree PEM as 125-135 mm.; and normal as above 135 mm. The nutritional reference population used here is the US standard adapted for use in developing countries by WHO [13].

Data analysis

The analysis consisted of a simple comparison between groups as to the prevalence of PEM at different levels. First, comparison was made between the children of December 1992 baseline survey (matched with 14 villages out of 60 villages) with December 1995 survey according to BRAC eligibility and four study cells. Second, comparison was made between the children of the BRAC member and non-member households in 1995 and differences (if any) were also assessed by different RDP inputs, such as, length, loan size and depth of membership. Third, comparison was made of the severe PEM among the children of the eligible household (excluding non-eligible households) by BRAC membership status between 1992 (pre-intervention) and 1995 (post-intervention).

Association between malnutrition level (% PEM) and each of the independent variables was examined by bivariate analysis and statistical significance of association was assessed by chi squire tests. A backward stepwise logistic regression was run in order to assess the influence of women's involvement in BRAC development activities on the prevalence of severe PEM of their children by controlling for age and sex of the child; sex of the household head; age, year of schooling and parity of the mother; MCH-FP area; and monthly per capita total expenditure. The SPSS 7.5 software package was used for analysis.

**Results**

*Baseline characteristics of study children*

Table 1 summarises a number of socio-demographic and other factors of the study children. The children were aged between 6 and 72 months, of them 50% were females and 50% were males. 16.1% of the children were severely malnourished. More female children (18.7%) were likely to suffer from severe malnutrition compared to male children (13.6%). 14.1% of the children were from the household headed by female. Majority of the mothers was aged between 26-35 years (49%); of them, 69.2% had no formal education, 22.1% attended primary school. 8.7% had post primary education (two mothers completed graduation). Approximately 68% of the families had 3 and more children. Nearly half (48.6%) of the households' monthly total expenditure was Tk. 500 and above, and as much as 27.3% households monthly expenditure was less then Tk. 400.

The majority of the children, 53.8% were residing inside the embankment, while 44.8% lived within MCH-FP area. 22.5% families of the children were from the BRAC-ICDDR,B cell, 26.1% from BRAC cell, 22.3% from ICDDR,B and 29.1% from Comparison cell.

Statistically significant univariate associations were found between malnutrition level and sex and age of the child; age and year of schooling of the mother; per capita monthly total expenditure; residence in any of the four cells, MCH-FP or non-MCH-FP area and inside or outside embankment. However, sex of the household head and mothers parity did not show any significant association with child malnutrition.

*Baseline comparison of PEM (MUAC <135mm.) by intervention area*

The trend in prevalence of PEM according to BRAC eligibility during December 1992 to December 1995 of the children from same 14 villages is shown in Table 2. There was an overall trend of reduction in the prevalence of PEM among children in all four cells. There were sharp drop in the prevalence of PEM between 1992 and 1995 (p<0.05) only in the BRAC+ICDDR,B and BRAC cells, specifically, among BRAC eligible households. In other words, nutritional status of the children has significantly improved in BRAC villages. Though prevalence was little lower in the ICDDR,B and comparison cell compared to baseline but the difference was not statistically significant.

*BRAC's development activities and child nutrition*

Tables 3 and 4 present the mean MUAC and the prevalence of severe PEM of the children by BRAC membership status and length of membership respectively. Results show that the prevalence of severe PEM was significantly lower among children of the BRAC members (12.1%) compared to TG non members (21.7) (p<0.05) and there were no differences between BRAC members and NTG non members. Interestingly, nutritional status of the children of the older members, participating for more than 25 months were better (9.4%) compared to the children of those who joined recently, i.e. for less than 12 months and 13-24 months respectively (19.0% and 16.1%) (p<0.001). However, according to cumulative loan size and type of membership, no consistent difference were observed (Annex 1 and 2).

Table 5. presents the results of comparison of the severe PEM among the children of the eligible household by BRAC membership status between 1992 (pre-intervention) and 1995 (post-intervention). The prevalence decreased significantly within these 3 years from 23.2% to 14.1% (p <0.05) of the children whose mothers became BRAC member. In case of children of non-member households, malnutrition remained almost at same level.

The results for women's involvement in BRAC development activities expressed as BRAC membership and its effect on the prevalence of severe PEM among their children, are presented in Table 6. After controlling for confounding variables, BRAC membership was consistently and positively related to child nutrition during the stepwise procedure. The children, whose mothers were participating in BRAC development activities, were 41% less likely to suffer from severe malnutrition compared to those of non-members (p<0.05). However, a significant gender differential in the prevalence of severe PEM was found to exist among the children of BRAC member as well as TG non member households (p<0.05) but not among NTG non member households (Table 7)

**Discussion**

This study has shown that the nutritional status of the children of BRAC villages improved significantly between 1992 and 1995. The findings were consistent with a study carried out by BIDS (Bangladesh Institute of Development Studies), where nutritional status was found to be better in BRAC villages compared to BRDB (Bangladesh Rural Development Board) and Grameen Bank. The BIDS study concluded that, since BRAC has both credit and health interventions whereas Grameen Bank and BRDP have only credit

interventions, thus improvement of outcome-based nutritional status of the poor may require both income generation opportunities and health interventions [5].

Our study also indicated that the prevalence of malnutrition was significantly lower among children whose mothers participated in BRAC development activities, this was observed even after controlling for other background factors. Now, it is important to provide an understanding of the mechanism that led to improve nutritional status of these children. Since the mothers had direct access to BRAC's credit and income generation activities, the positive effect of BRAC membership may be related to the income the mother is contributing to the household. A positive effect of maternal income on household food expenditure is the likely cause of increased dietary intake among children. It also may be argued that, programme participation may help to improve a woman's control over resources and consequently her participation in decisions making about household resources. There is some evidence that income earned by women and their control over household resources demonstrate a preference for ensuring adequate food consumption and using available funds for the direct benefit of children [4]. Thus, women's ability to create income and to control resource allocation directly affects the nutritional status of children throughout their growth [3]. Earlier studies conducted using same source of data (BRAC-ICDDR,B joint research project) also reported that the income was increased, women had better control over resources and decision making, and consequently per capita calorie consumption was increased among programme participants compare to non participant households [14,15,16]

However, better food intake alone does not necessarily improve nutritional outcomes, because of the influence of the health environment. The importance of water and sanitary condition, health seeking behaviour and morbidity pattern in relation to nutritional status of the children has been well-documented [8,9]. The Matlab study reported lower morbidity, better hygiene and sanitation practices and health seeking behaviour among participant households compared to non-participants [17]. These positive health practices may be related to the fact that these target households are the direct beneficiaries of preventive health inputs along with credit of RDP-EHC of BRAC. Thus, provision of income earning and health services for the poor and it's positive impact on the immediate factors of improved nutritional status, such as food intake and health-seeking behaviour is well evident. This might imply that, the inclusion of women in the process of BRAC's income development activities with the provision of basic health services are the critical factors in the improvement of the health and nutritional status of their children under 6 years of age. However, a high disparity in PEM prevalence among male and female children exists among BRAC member households, the girls being about twice as severely malnourished as the boys. This reflects to a persistent preferential treatment by mothers and other household members in favour of boys. This may, in part, be explained by the fact that BRAC does not have gender focused component in its programme. Thus, it is recommended to incorporate intensive gender focused education component in BRAC programmes to lift up the girls from their very low state of nutrition compared to their male counterparts.

**Table 1: Percentage distribution of malnourished children by background characteristics.**

| Variables | Total | | Malnutrition Level | |
|---|---|---|---|---|
| | No. of child | % | Mean MUAC (mm) | % of Severe PEM (MUAC <125 mm) |
| All children | 1518 | | 137.5 | 16.1 |
| | | | | |
| *Sex of the child* | | | $p < 0.05$ | $p < 0.01$ |
| Male | 759 | 50.0 | 138.2 | 13.6 |
| Female | 759 | 50.0 | 136.7 | 18.7 |
| | | | | |
| *Age of the child (year)* | | | $p < 0.001$ | $p < 0.001$ |
| 1 | 247 | 16.3 | 127.8 | 42.5 |
| 2 | 211 | 13.8 | 130.3 | 30.3 |
| 3 | 262 | 17.3 | 135.6 | 16.8 |
| 4 | 233 | 15.3 | 140.5 | 8.2 |
| 5 | 291 | 19.2 | 142.8 | 2.7 |
| 6 | 274 | 18.1 | 145.2 | 1.8 |
| | | | | |
| *Sex of the household head* | | | $p < 0.32$ | $p < 0.56$ |
| Male | 1306 | 86.0 | 137.2 | 16.2 |
| female | 212 | 14.0 | 139.0 | 15.6 |
| | | | | |
| *Age of the mother* | | | $p < .08$ | $p < 0.01$ |
| <25 | 192 | 13.8 | 136.0 | 22.9 |
| 26-30 | 336 | 24.1 | 136.8 | 19.6 |
| 31-35 | 349 | 25.0 | 136.5 | 16.6 |
| 36-40 | 165 | 11.8 | 137.8 | 13.3 |
| 41+ | 354 | 25.4 | 138.8 | 12.4 |
| | | | | |
| *Year of schooling of the mother* | | | $p < 0.001$ | $p < 0.05$ |
| No schooling | 953 | 69.2 | 136.3 | 18.2 |
| 1-5 years | 304 | 22.1 | 138.2 | 15.8 |
| 5+ years[t] | 120 | 8.7 | 141.7 | 8.3 |
| | | | | |
| *Mothers parity* | | | $p < 0.09$ | $p < 0.12$ |
| 1-2 | 396 | 32.1 | 137.0 | 18.7 |
| 3-6 | 741 | 60.1 | 137.5 | 15.7 |
| >6 | 96 | 7.8 | 137.2 | 14.6 |
| | | | | |
| *Total expenditure (Tk)/capita/month* | | | $p < 0.001$ | $p < 0.05$ |
| <400 | 368 | 27.3 | 135.7 | 19.0 |
| 400-499 | 324 | 24.1 | 136.3 | 18.8 |
| 500+ | 654 | 48.6 | 138.8 | 14.1 |
| | | | | |
| *Four Study Cells* | | | $p < 0.01$ | $p < 0.001$ |
| BRAC +ICDDR.B | 341 | 22.5 | 140.1 | 10.3 |
| Only BRAC | 396 | 26.1 | 139.1 | 10.6 |
| Only ICDDR.B | 339 | 22.3 | 136.6 | 18.0 |
| Comparison | 442 | 29.1 | 134.6 | 24.2 |
| | | | | |
| *MCH-FP area* | | | $p < 0.05$ | $p < 0.05$ |
| Yes | 680 | 44.8 | 138.4 | 14.1 |
| No | 838 | 55.2 | 136.7 | 17.8 |
| | | | | |
| *Embankment* | | | $p < 0.01$ | $p < 0.05$ |
| Inside | 816 | 53.8 | 136.4 | 18.0 |
| Outside | 702 | 46.2 | 138.7 | 14.0 |

[t] *Includes two mothers who were graduates.*
*Note: Total sample of some variables may vary due to missing data.*

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Table 2: Percentage distribution of malnourished (MUAC <135 mm.) children by programme area and BRAC eligibility in 1992 and 1995.

| BRAC Eligibility | BRAC-ICDDR,B | | BRAC | | ICDDR,B | | COMPARISON | |
|---|---|---|---|---|---|---|---|---|
| | 1992 | 1995 | 1992 | 1995 | 1992 | 1995 | 1992 | 1995 |
| Eligible | 55.2 | 29.5* | 49.6 | 25.5* | 55.6 | $40.6^{ns}$ | 56.5 | $48.0^{ns}$ |
| | (289) | (44) | (115) | (102) | (147) | (143) | (376) | (229) |
| Non- eligible | 43.8 | 26.4* | 37.8 | 27.6* | 48.6 | $47.2^{ns}$ | 47.5 | $40.2^{ns}$ |
| | (155) | (125) | (102) | (195) | (89) | (127) | (215) | (97) |
| Total (N) | 444 | 169 | 217 | 297 | 236 | 270 | 591 | 326 |

*Statistical differences between 1992 and 1995 in each cell, p<0.05; NS=Not significant*

Table 3: Nutritional status of children (6-72 mo.) by BRAC membership status.

| Indicators | BRAC Eligibility and membership | | |
|---|---|---|---|
| | BRAC member (n=273) | TG non-member (n=707) | NTG non-member (n=538) |
| Mean MUAC | 138.5 | $135.3^{†}$ | $139.8^{*}$ |
| % of Severe PEM (MUAC <125 mm) | 12.1 | 21.2 | 11.5 |

*† Between BRAC member and TG non member p=<0.001.*

*\* Between BRAC member and NTG non member p=NS*

Table 4: Nutritional status of children (6 mo.-72 mo.) by length of membership.

| Indicators | Length of membership (in month) | | | |
|---|---|---|---|---|
| | <12 mo. (n=21) | 12-24 mo. (n=62) | 25+ mo. (n=139) | TG non-member (n=707) |
| Mean MUAC | $133.5^{†}$ | $136.9^{*}$ | $139.3^{z}$ | 135.3 |
| % of Severe PEM (MUAC <125 mm) | 19.0 | 16.1 | 9.4 | 21.2 |

*† Between <12 mo. and TG non member p=NS.*

*\* Between 12-24 mo. and TG non member p=NS*

*$^{z}$ Between 25+ mo. @ TG non-member p=<0.001*

Table 5: Prevalence of severe PEM among eligible households by BRAC membership status during pre (1992) and post (1995) intervention period.

| Malnutrition | Year of Survey | | |
|---|---|---|---|
| | 1992 BRAC Eligible (n=827) | 1995 BRAC Eligible Member (n=184) | 1995 BRAC Eligible Non Member (n=707) |
| Severe PEM (MUAC <125 mm) | 23.2 | 14.1′ | 21.2* |

*†Between BRAC Eligible in 1992 and BRAC Eligible Member in 1995 p=<0.01.*

*\* Between BRAC Eligible in 1992 and BRAC Eligible Non Member in 1995 p=<0.01.*

Table 6: Effect of BRAC membership on the prevalence of severe malnutrition among children.

| Variables | Beta coefficient | Odds ratio | P value |
|---|---|---|---|
| BRAC membership | | | |
|     TG non member | 0.00 | 1.00 | |
|     BRAC Member | -0.53 | 0.59 | 0.05 |
|     NTG non Member | -0.65 | 0.52 | 0.01 |
| Sex | | | |
|     Female | 0.00 | 1.00 | |
|     Male | -0.56 | 0.57 | 0.001 |
| Age of the child in month | -0.80 | 0.45 | 0.001 |
| Total expenditure/capita/month | -0.001 | 0.99 | 0.01 |
| Constant | 1.80 | | 0.000 |

*Note: Table showing only those variables that had significant influence during stepwise regression procedure.*

Table 7: Gender differential of children in the prevalence of severe malnutrition by BRAC membership status.

| Sex | BRAC member | TG non member | NTG non member |
|---|---|---|---|
| Male | 7.7* | 17.7* | 11.1[NS] |
| Female | 16.1 | 26.4 | 12.0 |
| All | 12.1 | 21.2 | 11.5 |

*p value of Male vs. Female, \*=p<0.05, [NS]= Not Significant*

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# Annexes

Annex 1: Nutritional status of children (6 mo.-72 mo.) by cumulative loan size.

| Indicators | Sex | Cumulative loan size | | | | Statistical test | | |
|---|---|---|---|---|---|---|---|---|
| | | Zero loan (n=39) | Tk. <7500 (n=147) | Tk. >7500 (n=36) | TG non-member (n=538) | 1 vs. 4 | 2 vs. 4 | 3 vs. 4 |
| | | 1 | 2 | 3 | 4 | | | |
| Mean MUAC (mm) | M | 139.6 | 139.2 | 140.5 | 136.2 | NS | .05 | NS |
| | F | 138.0 | 136.0 | 138.9 | 134.4 | NS | .05 | NS |
| | All | 138.8 | 137.5 | 139.8 | 135.3 | NS | .05 | .01 |
| % of Severe PEM (MUAC <125 mm) | M | 5.0 | 7.2 | 10.0 | 17.7 | NS | .05 | NS |
| | F | 15.8 | 10.9 | 6.3 | 24.6 | NS | NS | NS |
| | All | 10.3 | 13.6 | 8.3 | 21.2 | NS | .05 | NS |

Annex 2: Nutritional status of children (6 mo.-72 mo.) by type of membership.

| Indicators | Sex | Type of membership | | | | Statistical test | | |
|---|---|---|---|---|---|---|---|---|
| | | Only savings (n=39) | Savings+ Credit (n=123) | Savings+ Credit+ Training (n=60) | TG non-member (n=707) | 1 vs. 4 | 2 vs. 4 | 3 vs. 4 |
| | | 1 | 2 | 3 | 4 | | | |
| Mean MUAC (mm) | M | 139.6 | 139.3 | 139.9 | 136.2 | NS | .05 | .05 |
| | F | 138.0 | 135.9 | 137.5 | 134.4 | NS | NS | NS |
| | All | 138.8 | 137.7 | 138.6 | 135.3 | NS | .05 | .05 |
| % of Severe PEM (MUAC <125 mm) | M | 5.0 | 8.1 | 7.4 | 17.7 | NS | NS | NS |
| | F | 15.8 | 19.7 | 12.1 | 24.6 | NS | NS | NS |
| | All | 10.3 | 13.8 | 10.0 | 21.2 | NS | NS | NS |

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