

Impact of BRAC Reproductive Health and Disease Control Programme on Practice of Personal Hygiene

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Summary findings

The campaign on safe water, sanitation and hygiene practices has been an important priority in BRAC's health interventions including RHDC. The RHDC hygiene education is concerned with establishing or inducing changes in personal and group attitudes and behaviour that promote healthy living. Given the situation, one may ask about the achievements of RHDC in improving the sanitation and hygiene practice.

Thus, this study evaluated the impact of BRAC's RHDC programme on different issues of personal hygiene compared to baseline status as well as the comparison area. In the baseline study (1992) fertility and mortality data were collected from 12,073 households (programme 8,072 and comparison 4,001) representing a total of 261 villages (programme 184 and comparison 77). But, in the follow-up study done in 2000, 103 villages (programme 80 and comparison 23) were revisited. Using the cluster survey method, data were collected from 8,033 households (programme 4,003 and comparison 4,030). The programme villages were drawn from Bogra and Dinajpur districts whilst the comparison villages from Jaipurhat district. It is to be noted that for measuring the level of different health service use and hygienic practices, data were collected from 10% and 25% on the total households covered for mortality and fertility estimate during the baseline and the follow-up studies respectively, because measurement of these issues required lesser number of sample than the mortality and fertility estimates. However, the following sections present the key findings of the study.

The results showed that the use of slab latrine for defaecation increased compared to the benchmark status of 14.8% to 22.7% in the programme area as opposed to 7.7% to 14.1% in the comparison area. The increase of slab latrine use was higher in the comparison area than in the programme area (83 versus 53 percent). The use of slab latrine among the NTG households increased in both the areas, but it decreased for TG.

The physically verified proportion of the respondents keeping ash/soap near latrines for hand washing after defecation increased from the baseline status to 10 percent in the programme area, in contrast with the comparison area, where it decreased to 5 percent.

The physically verified follow-up study data revealed that the disposal of baby's stool in a fixed hole was significantly higher in the programme area (99%) than in the comparison area (91%). The use of right hand for carrying water pot by the respondents from and to the latrine decreased to 25.4% from the baseline status of 32.3% in the programme area and to 11.6% from 14.8% in the comparison area.

In the benchmark survey, the most mentioned reason for cleaning teeth was the "prevention of bad odour of mouth." But in the programme area the proportion of such response decreased to 62% from the benchmark of 78% in contrast with the increase in the comparison area to 86% from 76%. The proportion of respondents cleaning teeth thrice or more a week increased to 99% from the benchmark of 35.3% in the programme area and to 98.8% from 15% in the comparison area. But the overall increase was higher in the comparison area than in the programme. Use of tooth powder/paste increased substantially from 37.8% to 77.8% in the programme area and from 26.4% to 68.7% in the comparison area. The follow-up status revealed a significant difference between the two areas. But the increase was higher in comparison area than in the programme (160 versus 106 percent).

The overall situation of practising personal hygiene did not improve much in the programme area, requiring further efforts in strengthening the hygiene education for improving people's hygiene practices.

Introduction

The dynamic concept of health development assumes various shapes and forms based on overall need of its surroundings. In Bangladesh, the need for improved sanitary and hygiene behaviour is essential to control high incidence of infectious and parasitic diseases leading to reduced infant and child mortality. Such understanding prompted BRAC to help improve the knowledge and practice of rural communities on sanitation and hygiene. Thus, campaign on safe water, sanitation and hygiene practices has been an important priority in BRAC's health interventions including RHDC.

The RHDC, indeed, is the successor to BRAC's defunct Women's Health and Development Programme (WHDP). With the primary thrust to improve health and nutritional status of the most vulnerable segment of the population (i.e., women and children) the WHDP operated during 1991-1995. It had five interconnected projects: i) Comprehensive Health Development Project (CHDP), ii) Facilitation of the Expanded Programme on Immunisation (FEPI), iii) Primary Health Care in BRAC Development Programme (PHC-BDP), iv) BRAC Education Programme (BEP), and v) Health Resource Centre (HRC). The CHDP, a cornerstone of the programme, was implemented in 10 *upazilas* of Dinajpur, Bogra and Mymensingh regions covering a population of about 1.7 million; half of whom were poor. Through CHDP BRAC directly implemented antenatal care (ANC), growth monitoring (GM) for children, tuberculosis (TB) control, family planning (FP), training of traditional birth attendants (TBA), and development of village women's forum (WF), and facilitated expanded programme on immunisation (EPI), and vitamin A capsule (VAC) distribution.

Besides the above components, some supplementary elements such as establishment of maternity waiting home (MWH), facilitation to the government district hospitals for managing emergency obstetric cases were piloted for maternal mortality reduction (MMR) in the Bogra and Dinajpur sadar *upazilas*. In these *upazilas*, special inputs were given for safe motherhood and pneumonia control. All the services in the pilot *upazilas* were open for all, regardless of their socioeconomic background. While in other *upazilas* the WHDP services were targeted primarily to the poor (Karim et al, 1995). However, BRAC carried out a comprehensive baseline study covering a wide

range of issues of WHDP to enable the management to evaluate the impact of the programme (Ali et al. 1992).

Nonetheless, BRAC consolidated, reinforced and augmented the core of the WHDP activities under the banner of the present RHDC in 1996. This helped make the RHDC consistent and compatible with the concept of reproductive health ratified in the 1994 International Conference on Population and Development in Cairo. Consequently, the goal of RHDC is to reduce infant, child and maternal mortality and morbidity, fertility, and the improvement in the nutritional status of children, adolescents, and women. In fact, this goal is consistent with that of the WHDP. However, the RHDC provides a package of essential reproductive health services viz. adolescent family life education, contraception, pregnancy related care including safe delivery and referral of complicated cases to the tertiary level of care, treatment and control of reproductive tract infections (RTI), sexually transmitted diseases (STD) and HIV/AIDS awareness, control of TB and acute respiratory infection (ARI), and basic curative care. Moreover, the RHDC offers possible backup and secondary referral services for the above services through BRAC's fixed Health Centres or *shushasthos* (Table 1). In addition, the RHDC facilitates the use of a number of government services including satellite clinics, immunisation, family planning, vitamin A capsule distribution, and water and sanitation programme. Originally BRAC health services were open to all, but in August 1997

Table 1 A comparative picture of health services under WHDP and RHDC

WHDP		RHDC
Facilitation	Supplementation	
Satellite clinics, EPI and referral, Family planning, Vitamin. A Capsule, Water and Sanitation	Antenatal care where satellite clinic is not held. Iron supplementation and TBA training, Health, Nutrition, Family planning, Growth monitoring and selective supplementation, ARI control, TB control, Hygiene education and <i>Shebika</i> training, Maternity waiting home	<i>Reproductive health:</i> Pregnancy care, FP, RTI/STD, HIV/AIDS awareness, Adolescent reproductive health education, Supplementation to pregnant women and children. <i>Disease control:</i> Community based ARI and TB control, <i>EPI</i> , <i>VAC</i> and De-worming. BRAC Health Centre – <i>shushastho</i> : All primary and secondary clinical support

BRAC shifted its approach to focus on the pressing health needs of the poor, particularly those involved in NGO (including BRAC) micro-finance activities, because the poor do not have easy access to the existing health services, and their incomes are eroded due to ill-health.

BRAC trained community health workers (CHW) known as *Shastho shebikas* (SS) and traditional birth attendants (TBA) are the key resources used to mobilise people at the community level for RHDC services (BRAC, 1999). The RHDC staffs regularly liaise with these community volunteers and supervise their activities.

RHDC has a coverage of over 9.7 million people across the country including the areas under the former WHDP, and provides comprehensive reproductive and disease control services. The educational, preventive and promotional services at the grassroots level is supplemented by secondary level of care through *shushasthos* located mostly at *upazila* towns. By now there are 90 *shushasthos* functioning throughout the country. Each *shushastho* has a physician, 2 paramedics or nurses or family welfare visitors, one ayah, one lab technician and one service staff. The available facilities in each *shushastho* include indoor, and outdoor services, maternity care, family planning, RTI/STD, basic pathological services and counselling.

BRAC's RHDC staff together with the trained community volunteers (*Shastho shebikas* (SS)/*Shastho kormi* (SK) and TBAs are providing health education on safe water, sanitation and hygiene practices to the community. BRAC workers also motivate the villagers to drink tubewell water and use it for washing and cleaning. The villagers are also mobilized to construct and use either pit or slab latrines depending on their ability. BRAC workers cooperate with the government staff to promote safe water and sanitation. The RHDC hygiene education is concerned with establishing or inducing changes in personal and group attitudes and behaviour that promote healthy living. Given the situation, one may ask about the achievements of RHDC in improving the sanitation and hygiene practice.

Methods and materials

Four years have elapsed since the WHDP activities have been amalgamated with that of the RHDC programme. If the WHDP period is taken into account the life span of the programme activities exceeds 8 years in 2000. At this stage, BRAC intended to evaluate the impact of RHDC by tracking some important aspects of practising personal hygiene compared to the benchmark information collected in March 1992 (Ali et al, 1993). It is expected that the study results will be useful to the programme managers and other agencies working in the same field for tracking/enhancing the effectiveness of the programme. The specific indicators of both the benchmark and follow-up studies were shown in Table 1.1.

Table 1.1 Variables/indicators of the baseline and impact/follow-up studies

Independent	Dependent
1. Study area: Programme and Comparison, 2. Sex of household heads*, respondents, 3. Main occupations of household heads, 4. Household land holding, 5. BRAC target and non-target population (TG/NTG), 6. Education of household heads and adult members, 7. Age, 8. marital status.	1. Hand washing practice after defaecation, 22. Place of children's stool disposal, 23. Place of solid waste disposal, 24. Hand used for carrying water pot to latrines, 25. Practice for cleaning teeth, 26. Importance of cleaning teeth, 27. Frequency cleaning teeth, 28. Time for cleaning teeth, 29. Ingredients used for cleaning teeth.

*Data on these indicators/variables were not collected in the baseline survey.

Study area

The study areas were categorised into 'pilot' and 'intervention' *upazilas* in the baseline study. The pilot programme was implemented in the Bogra and Dinajpur sadar *upazilas* where special inputs were given to reduce maternal mortality and ARI. While such inputs were not given in intervention *upazilas* including Kahalu in Bogra district, Gobindaganj sadar in Gobindaganj district, Parbotipur and Fulbari in Dinajpur district and Mymensingh sadar, Muktagachha, Trishal and Phulpur in Mymensingh district. However, the baseline study was implemented in the Bogra and Dinajpur sadar *upazilas* (pilot area), and in Kahalu, Gobindaganj, Parbotipur and Fulbari *upazilas* (intervention area) in March 1992. The Jaipurhat sadar and Khetlal *upazilas* of the adjacent Jaipurhat district were studied as 'comparison area'. This study revisited the villages covered by the baseline study in Jaipurhat as well as the Bogra and Dinajpur sadar *upazilas*

excluding the 'intervention' *upazilas*. The reason for exclusion of the 'intervention' villages was that the baseline study did not reveal much difference in many indicator values between the 'pilot' and 'intervention' villages. Secondly, concentration on 'pilot' villages helped substantially minimise costs and operational difficulties of the present study without affecting the sample size and study quality. It is to be noted that in the follow up study 2000 the 'pilot' area was referred to as 'Programme' area.

The programme area received WHDP intervention from 1992-1995 followed by RHDC from 1996. In contrast, 23 villages of the comparison area received no BRAC health intervention but micro-credit until the impact study launched, while both micro-credit and EHC¹ interventions were given in 54 villages from mid 1997. In fact, we excluded the latter villages from the study.

Sample size

The baseline study (1992), on aggregate, covered 12,073 households (pilot 4,083, intervention 3,989 and comparison 4,001) from 261 villages (pilot 81, intervention 103 and comparison 77). This huge number of households was required for data collection on maternal mortality through "sisterhood method"², fertility and child mortality. Ten percent of the sub-sample of the total households was systematically visited during baseline survey (1992) for data collection on different aspects of hygienic behaviour. The impact study 2000, however, revisited 103 villages (programme 80 and comparison 23) and interviewed 8,033 households (programme 4,003 and comparison 4,030) following the same methods embraced in the baseline study. To have adequate sample for exclusive breastfeeding, the impact study/follow-up covered 25% of the households instead of the 10% addressed in the baseline study, but the measurement of other health service utilisation required even a lower sample size.

¹ Essential Health Care is an important component of health implemented through BRAC Development Programme. It comprised of Health and Nutrition Education, Water and Sanitation, Family Planning, and Basic Curative Services.

² An indirect technique for deriving population-based estimates of maternal mortality. It uses the proportions of adult sisters dying during pregnancy, childbirth, or the puerperium reported by adults during a census or survey, to derive a variety of indicators of maternal mortality. But the method gives a status of 10-12 years back.

Sampling procedures

All the study villages were selected using the multistage sampling methods. Using the cluster survey methods, a total of 8,033 households were visited for collecting data on fertility and mortality. Health service related data were collected from 25% of the total study households³ (programme 1,032 and comparison 994). These households were chosen using the systematic sampling methods.

Tools and techniques of data collection

A pre-tested standard questionnaire containing structured and unstructured questions was used to collect data. Primarily responsible and competent mothers were interviewed by visiting the households. Alongside the mothers other competent members (such as household heads or elders) of the households were also consulted on information concerning sensitive variables such as landholding, etc.

Data collection

Twenty trained field investigators worked in 4 teams to collect data. Each team had a supervisor for guiding and monitoring the fieldwork. Five percent of the households covered by the interviewers were spot-checked or re-interviewed for consistency and completeness of data.

Quality control

Measures were taken for quality control at different levels of data collection and analysis. The questionnaire was pre-tested. Besides, the team supervisors acted as the primary quality control officers at field level. They spot-checked and re-interviewed 5% of the households covered by the interviewers. On return from fieldwork everyday the field supervisors checked the filled-in questionnaires for consistency and completeness of data.

The principal investigators also regularly visited and supervised the fieldwork. At the Head Office, the questionnaires were strictly scrutinised and edited under the close supervision of the principal researchers. Besides, the baseline data stored in the computer

³ In the benchmark study it was 10 percent.

dBase software package were also retrieved and meticulously checked for quality and analysis.

Data processing and analysis

Data analysis was conducted using the SPSS software package. Two-way and crosstables were constructed for data presentation. Chi-square tests were performed to measure the level of significance of differences between the baseline and the impact/follow-up studies as well as between the programme and the comparison areas. Only the significant differences between the variables or indicators are mentioned in the results ($p < 0.05$, $p < 0.01$, and $p < 0.001$).

However, the operational definitions of variables/indicators unique to this chapter as well as the analysis strategy are outlined below.

Operational definition of variables/indicators

Slab latrine- A latrine is constructed with a slab, rings and water seal by reinforced concrete cement.

Pit latrine- Refers to a dug with more than 4 feet depth and the surface is covered with a platform made of bamboo slices or any suitable materials with provision of a small hole to discharge stool.

“TG” (Target group) refers to the households owning 0-50 decimals of land (except the homestead), and any member aged 12 or more years sells manual labour for at least 100 days per annum for survival.

“NTG” (Non-target group) refers to the households, which do not fall under the above criteria of TG.

Analytical strategy

Multilateral comparisons were carried out to measure the changes in the study indicators. Firstly, comparisons were done between the outcomes of the baseline (1992) and the follow-up (2000) surveys across different variables/indicators for both programme and comparison areas. Secondly, within the follow-up survey results, comparisons were made between the programme and the comparison areas.. In case of any important result, a

comparison between the target groups (TG) and non-target groups (NTG) was also attempted.

The people are given education to wash their hands after defaecation with ash or soap, and always keep those near their latrines. The interviewers physically verified the surroundings of the latrines of the respondents who claimed to have used and held ash/soap. Likewise, the place for disposing the stool of young children less than three years old was also physically checked.

Relative change in major indicator values from baseline status to follow-up status occurred in both the study areas was calculated by using the following formula:

$$\text{Relative change} = \frac{\text{Follow-up status} - \text{Baseline status}}{\text{Baseline status}} \times 100$$

Limitations

- i) BRAC's non-health interventions (i.e., micro-finance, issue-based routine meetings on health and other social issues), and continual interactions between the villagers and BRAC staff in some of the comparison villages might have contributed in changing certain health behaviour particularly of the micro-finance participants. Therefore, the health behaviour related data of the comparison area might have upward bias to some extent.
- ii) Some baseline data in computer were lost due to long time storage. It was apprehended that such an event might delimit the dimensions of data analysis. To prevent this, all the data were extensively checked, and missing variables were dropped from the analysis.
- iii) The spread of the study villages in the programme area was relatively wider than those in the comparison area. This was likely to shade the results of the programme area in some cases.

Results

Defecation, hand washing and waste disposal

Table 2 illustrates that the use of slab latrines increased in both the study areas compared to the benchmark period (from 14.8% to 22.7% in the programme area and 7.7% to 14.1% in the comparison area respectively). The difference was significant between the

Table 2 Households by place of defaecation and study area

Place of defecation	Baseline						Follow-up					
	Programme			Comparison			Programme			Comparison		
	TG	NTG	Total	TG	NTG	Total	TG	NTG	Total	TG	NTG	Total
1	2	3	4	5	6	7	8	9	10	11	12	13
Slab	18.7 (32)	11.8 (27)	14.8 (59)	9.0 (16)	6.5 (14)	7.7 (30)	12.8 (46)	27.9 (188)	22.7 (234)	1.2 (3)	18.6 (137)	14.1 (140)
Pit	4.7 (8)	5.3 (12)	5.0 (20)	1.1 (2)	1.9 (4)	1.5 (6)	8.6 (31)	25.0 (168)	19.3 (199)	5.8 (15)	7.8 (57)	7.2 (72)
Hole	14.6 (25)	14.5 (33)	14.5 (58)	7.3 (13)	7.0 (15)	7.2 (28)	10.0 (36)	13.2 (89)	12.1 (125)	5.0 (13)	13.3 (98)	11.2 (111)
Anywhere	62.0 (106)	68.4 (156)	65.7 (262)	82.5 (146)	84.6 (181)	83.6 (327)	68.5 (246)	33.9 (228)	45.9 (474)	88.0 (228)	60.3 (443)	67.5 (671)
Total	171	228	399	177	216	393	359	673	1032	259	735	994

Notes: 1. Figures in parentheses indicate cell frequency

2. Slab: col. 4 Vs col. 10 $p < 0.05$, col. 7 Vs col. 13 $p < 0.05$, col. 10 Vs col. 13 $p < 0.001$

baseline and the follow-up surveys both for the programme ($p < 0.05$) and the comparison areas ($p < 0.05$). The overall increase in the use of lab latrines from the baseline status to the follow-up study was higher in the comparison area than in the programme (83 versus 53 percent). Besides, the follow-up study data also revealed a significant difference between the study areas ($p < 0.001$). The use of slab latrines among the NTG households increased in both the areas, but it decreased for TG.

Table 3 reveals that hand washing with ash/soap after defaecation increased to 72.6% from the benchmark figure of 59.6% in the programme area and for comparison area from 28% to 46.9%. The increase of responses regarding using ash/soap for hand washing after defecation was also higher in the comparison area than in the programme (68 versus 22 percent). The differences were significant between the baseline and follow-up surveys across the study areas ($p < 0.005$ programme, $p < 0.005$ comparison). Similar difference was also evident between the study areas in the follow-up survey ($p < 0.001$).

The proportion of the respondents keeping ash/soap near latrines increased from the baseline status of 60.1% to 65.8% (an increase of 10 percent) in the programme area, in contrast with the comparison area, where it decreased from 69.1% to 65.7% (a decrease of 5 percent) (Table 4).

Table 5 shows that the proportion of households reporting to be disposing baby's stool in a specific hole decreased from the baseline status of 11.5% to 9.8% in the programme

Table 3 Respondents by use of ingredients for hand washing after defaecation and study area

Ingredients	Baseline						Follow-up					
	Programme			Comparison			Programme			Comparison		
	TG	NTG	Total	TG	NTG	Total	TG	NTG	Total	TG	NTG	Total
1	2	3	4	5	6	7	8	9	10	11	12	13
Don't wash	0.5 (1)	0.5 (1)	0.5 (2)	0	0.5 (1)	0.3 (1)	0	0	0	0.4 (1)	0.4 (3)	0.4 (4)
Only water	2.8 (6)	3.2 (6)	3.0 (12)	19.8 (36)	17.1 (36)	18.3 (72)	7.4 (27)	4.5 (30)	5.5 (57)	7.0 (18)	8.7 (64)	8.2 (82)
Ash/soap	56.8 (121)	62.9 (117)	59.6 (238)	22.5 (41)	32.7 (69)	28.0 (110)	61.9 (226)	78.4 (523)	72.6 (749)	39.9 (103)	49.3 (363)	46.9 (466)
Water & soil	39.9 (85)	33.3 (62)	36.8 (147)	57.7 (105)	49.8 (105)	53.4 (210)	30.7 (112)	17.1 (114)	21.9 (226)	52.7 (136)	41.6 (306)	44.5 (442)
Total	213	186	399	182	211	393	365	667	1032	258	736	994

Notes: 1. Figures in parentheses indicate cell frequency

2. Ash/soap: col. 4 Vs col. 10 $p < 0.005$, col. 7 Vs col. 13 $p < 0.005$, col. 10 Vs col. 13 $p < 0.001$

area but increased from 6.1% to 13.5% in the comparison area. The follow-up survey data showed a significant difference between the study areas ($p < 0.05$). In the comparison area, the difference between the baseline and the follow-up survey was also significant ($p < 0.01$).

Table 4 Presence of ash/soap near latrines of the households and study area (verified)

Presence of ash/ soap	Baseline						Follow-up					
	Programme			Comparison			Programme			Comparison		
	TG	NTG	Total	TG	NTG	Total	TG	NTG	Total	TG	NTG	Total
1	2	3	4	5	6	7	8	9	10	11	12	13
Yes	52.9 (64)	67.5 (79)	60.1 (143)	51.2 (21)	79.7 (55)	69.1 (76)	49.6 (112)	72.8 (381)	65.8 (493)	65.0 (67)	65.8 (239)	65.7 (306)
No	47.1 (20)	32.5 (38)	39.9 (95)	48.8 (20)	20.3 (14)	30.9 (34)	50.4 (114)	27.2 (142)	34.2 (256)	35.0 (37)	34.2 (125)	34.3 (162)
Total	121	117	238	41	69	110	226	523	749	103	363	466

Note: Figures in parentheses indicate cell frequency

The physically verified follow-up survey data revealed that the disposal of baby's stool in a fixed place/hole was significantly higher in the programme area (99%) than in the comparison area (91%) ($p < 0.01$). However, the verified positive result significantly increased from 74% of the benchmark to 91% in the comparison area (23 percent) ($p < 0.01$), but in the programme area it followed a slower increase (from 97% to 99%) (2 percent) (Table 6).

Table 5 Respondents by place of baby's stool disposal and study area

Place of baby's stool disposal	Baseline						Follow-up					
	Programme			Comparison			Programme			Comparison		
	TG	NTG	Total	TG	NTG	Total	TG	NTG	Total	TG	NTG	Total
1	2	3	4	5	6	7	8	9	10	11	12	13
Anywhere	75.9 (88)	74.5 (102)	75.1 (190)	92.0 (103)	86.6 (116)	89.0 (219)	81.1 (210)	73.3 (303)	67.3 (513)	67.4 (93)	59.3 (217)	61.5 (310)
Specific place	13.8 (16)	13.1 (18)	13.4 (34)	1.8 (2)	7.5 (10)	4.9 (12)	11.6 (30)	15.3 (63)	13.8 (93)	19.6 (27)	27.0 (99)	25.0 (126)
Specific hole	10.3 (12)	12.4 (17)	11.5 (29)	6.2 (7)	6.0 (8)	6.1 (15)	7.3 (19)	11.4 (47)	9.8 (66)	13.0 (18)	13.7 (50)	13.5 (68)
Total	116	137	253	112	134	246	259	413	672	138	366	504

Notes: 1. Figures in parentheses indicate cell frequency

2. Specific hole: col. 7 Vs col. 13 $p < 0.01$, col. 10 Vs col. 13 $p < 0.05$

The disposal of solid waste in a fixed hole significantly increased from the benchmark status in the follow-up survey in both the study areas (programme area 46.4% to 53.9%, $p < 0.05$ and comparison area 43% to 63.7%, $p < 0.001$). But the increase in the comparison area was higher than in the programme (48 versus 16 percent). The follow-up data also showed a significant difference between the two areas ($p < 0.01$).

Besides this, solid waste disposal in a specific place decreased from the benchmark of 37% to 31% in the programme area and 29% to 21% the comparison area respectively ($p < 0.01$) (Table 7).

The use of right hand for carrying water pot by the respondents to and from the latrine decreased to 25.4% from the baseline status of 32.3% in the programme area and

Table 6 Status of physical verification of the households disposing child's stool in fixed place/hole and study area

Disposed in fixed place/hole?	Baseline						Follow-up					
	Programme			Comparison			Programme			Comparison		
	TG	NTG	Total	TG	NTG	Total	TG	NTG	Total	TG	NTG	Total
1	2	3	4	5	6	7	8	9	10	11	12	13
Yes	96.4 (27)	97.1 (34)	96.8 (61)	77.8 (7)	72.2 (13)	74.1 (20)	98.0 (48)	99.1 (108)	98.7 (156)	93.3 (42)	90.7 (136)	91.3 (178)
No	3.3 (1)	3.0 (1)	3.2 (2)	22.2 (2)	14.3 (5)	27.8 (7)	2.0 (1)	0.9 (1)	1.3 (2)	6.7 (3)	9.3 (14)	8.7 (17)
Total	28	35	63	9	18	27	49	110	159	45	149	194

Notes: 1. Figures in parentheses indicate cell frequency

2. Yes: col. 7 Vs col. 13 $p < 0.01$, col. 10 Vs col. 13 $p < 0.01$

to 11.6% from 14.8% in the comparison area. Although the difference between the two areas in the follow-up status was significant ($p < 0.001$) but the extent of decrease from baseline status to follow-up study was equal for both study areas. However, the follow-up

survey data showed that the decline in the proportion of respondents carrying water pot by right hand was higher among the TG than the NTG in the programme area (Table 8).

Table 7 Respondents by place of solid waste disposal and study area

Place of solid waste disposal	Baseline						Follow-up					
	Programme			Comparison			Programme			Comparison		
	TG	NTG	Total	TG	NTG	Total	TG	NTG	Total	TG	NTG	Total
1	2	3	4	5	6	7	8	9	10	11	12	13
Any where	19.3 (41)	13.4 (25)	16.5 (66)	29.1 (53)	26.6 (56)	27.7 (109)	18.9 (69)	12.9 (86)	15.0 (155)	24.4 (63)	12.4 (91)	15.5 (154)
Specific place	38.5 (82)	35.5 (66)	37.1 (148)	31.3 (57)	27.5 (58)	29.3 (115)	30.1 (110)	31.6 (211)	31.1 (321)	20.5 (53)	20.9 (154)	20.8 (207)
Specific hole	42.3 (90)	51.1 (95)	46.4 (185)	39.6 (72)	46.0 (97)	43.0 (169)	51.0 (186)	55.5 (370)	53.9 (556)	55.0 (142)	66.7 (491)	63.7 (633)
Total	213	186	399	182	211	393	365	667	1032	258	736	994

Notes: 1. Figures in parentheses indicate cell frequency, 2. Specific hole: col. 4 Vs col. 10 $p < 0.05$, col. 7 Vs col. 13 $p < 0.001$, col. 10 Vs col. 13 $p < 0.01$, 3. Specific place: col. 7 Vs col. 13 $p < 0.01$

Table 8 Respondents by carrying water pot during commuting to and from latrine and study area

Hand used for carrying pot	Baseline						Follow-up					
	Programme			Comparison			Programme			Comparison		
	TG	NTG	Total	TG	NTG	Total	TG	NTG	Total	TG	NTG	Total
1	2	3	4	5	6	7	8	9	10	11	12	13
Right-right	34.3 (73)	30.1 (56)	32.3 (129)	13.7 (25)	15.6 (33)	14.8 (58)	19.2 (70)	28.8 (192)	25.4 (262)	9.7 (25)	12.2 (90)	11.6 (115)
Right-left	15.0 (32)	15.6 (29)	15.3 (61)	30.2 (55)	20.9 (44)	25.2 (99)	17.8 (65)	19.0 (126)	18.6 (192)	12.4 (32)	15.4 (113)	14.6 (145)
Left-left	33.3 (71)	34.4 (64)	33.8 (135)	35.2 (64)	41.2 (87)	38.4 (151)	34.0 (124)	32.2 (211)	32.8 (339)	48.4 (125)	45.8 (337)	46.5 (462)
Left-right	5.2 (11)	5.4 (10)	5.3 (21)	14.8 (27)	11.4 (24)	13.0 (51)	9.9 (36)	6.9 (45)	7.9 (82)	22.1 (57)	15.9 (117)	17.5 (174)
Unspecified	12.2 (26)	13.9 (27)	13.4 (53)	6.0 (11)	10.9 (23)	8.7 (34)	19.2 (70)	13.0 (87)	15.2 (157)	7.4 (19)	10.7 (79)	9.9 (98)
Total	213	186	399	182	211	393	365	667	1032	258	736	994

Notes: 1. Figures in parentheses indicate cell frequency, 2. Right-right: col. 10 Vs col. 13 $p < 0.001$

Dental care

Table 9 shows that in both the surveys, all respondents expressed the need for cleaning teeth regularly. In the benchmark survey, the most mentioned reason for cleaning teeth was the "prevention of bad odour of mouth." But in the programme area the proportion of such response decreased to 62% from the benchmark of 78% in contrast with the increase in the comparison area to 86% from 76%. In the follow-up survey a substantial proportion of the respondents also mentioned "health is wealth" as a reason for cleaning teeth. It was higher (55%) in the programme area than in the comparison (27%).

Table 9 Respondents by reason for cleaning tooth and study area

Reasons for cleaning tooth	Baseline						Follow-up					
	Programme			Comparison			Programme			Comparison		
	TG	NTG	Total	TG	NTG	Total	TG	NTG	Total	TG	NTG	Total
1	2	3	4	5	6	7	8	9	10	11	12	13
Prevent foul smell	77.0 (164)	79.0 (147)	77.9 (311)	72.0 (131)	80.9 (169)	76.3 (300)	60.8 (222)	62.1 (414)	61.6 (636)	87.2 (225)	86.1 (634)	86.4 (859)
Prevent falling teeth	9.9 (21)	12.4 (23)	11.0 (44)	12.1 (22)	18.2 (38)	15.3 (60)	8.5 (31)	8.8 (59)	8.7 (90)	6.2 (16)	12.2 (90)	10.7 (106)
Health is wealth	6.1 (13)	4.3 (8)	5.3 (21)	5.5 (10)	6.2 (13)	5.9 (23)	56.4 (206)	53.4 (356)	54.5 (562)	26.0 (67)	26.8 (197)	26.6 (264)
Habit	1.4 (3)	2.7 (5)	2.0 (8)	0	0.5 (1)	0.3 (1)	1.1 (4)	0.4 (3)	0.7 (7)	2.7 (7)	8.2 (60)	6.7 (67)
Religious reason	0	1.6 (3)	0.8 (3)	1.6 (3)	1.0 (2)	1.3 (5)	0	1.2 (8)	0.8 (8)	1.2 (3)	1.2 (9)	1.2 (12)
Others	27.7 (59)	23.1 (43)	25.6 (102)	20.9 (38)	10.0 (21)	15.0 (59)	0	0	0	0	0	0
n	213	186	399	182	211	393	365	667	1032	258	736	994

Notes 1. Figures in parentheses indicate cell frequency. 2. Multiple responses considered

The percentage of respondents cleaning teeth everyday was identical for both the study areas (programme 96% and comparison 96.8%). Whilst the proportion of respondents cleaning their teeth thrice or more a week increased to 99% from the benchmark of 35.3% in the programme area ($p < 0.001$) and to 98.8% from 15% in the comparison area ($p < 0.001$) (Table 10). But the increase was 559 percent higher in the comparison area than in the programme (181 percent).

Both the surveys revealed that cleaning of teeth during morning was almost universal for both the study areas. Although, a considerable proportion of the respondents from both the study areas reported to clean tooth even after lunch or supper in the baseline survey, such responses considerably decreased in the follow-up survey (Table 11).

Table 10 Respondents by frequency of weekly tooth cleaning and study area

Weekly frequency of tooth cleaning	Baseline						Follow-up					
	Programme			Comparison			Programme			Comparison		
	TG	NTG	Total	TG	NTG	Total	TG	NTG	Total	TG	NTG	Total
1	2	3	4	5	6	7	8	9	10	11	12	13
Once	32.9 (70)	25.3 (47)	29.3 (117)	49.5 (90)	46.0 (97)	47.6 (187)	0.3 (1)	0.9 (6)	0.7 (7)	1.2 (3)	0.8 (6)	0.9 (9)
Twice	31.9 (68)	39.2 (73)	35.3 (141)	35.2 (64)	39.3 (83)	37.4 (147)	0.8 (3)	0	0.3 (3)	0	0.4 (3)	0.3 (3)
Thrice or more	35.2 (75)	35.5 (66)	35.3 (141)	15.4 (28)	14.7 (31)	15.0 (59)	98.9 (361)	99.1 (661)	99.0 (1032)	0.8 (2)	98.8 (733)	98.8 (989)
n	213	186	399	182	211	393	365	667	1022	258	736	994

Notes: 1. Figures in parentheses indicate cell frequency. 2. nc-Data not collected. 3. Thrice or more: col. 4 Vs col. 10 $p < 0.001$, col. 7 Vs col. 13 $p < 0.001$

Table 11 Respondents by time of cleaning teeth and study area

Time for tooth cleaning	Baseline						Follow-up					
	Programme			Comparison			Programme			Comparison		
	TG	NTG	Total	TG	NTG	Total	TG	NTG	Total	TG	NTG	Total
1	2	3	4	5	6	7	8	9	10	11	12	13
Morning	98.6 (210)	100.0 (186)	99.2 (396)	98.9 (179)	98.1 (207)	98.5 (386)	99.7 (364)	99.3 (662)	99.4 (1026)	98.8 (255)	98.6 (726)	98.7 (981)
After lunch	43.2 (92)	46.8 (87)	44.9 (179)	26.5 (48)	30.8 (65)	28.8 (113)	8.8 (32)	8.4 (56)	8.5 (88)	8.1 (21)	6.9 (51)	7.2 (72)
After dinner	30.5 (65)	31.7 (59)	31.1 (124)	22.1 (40)	21.8 (46)	21.9 (86)	2.7 (10)	5.5 (37)	4.6 (47)	1.6 (4)	5.7 (42)	4.6 (46)
Others	28.6 (61)	30.1 (56)	29.3 (117)	10.5 (19)	12.8 (27)	11.7 (46)	0.8 (3)	0.7 (5)	0.8 (8)	1.6 (4)	2.4 (18)	2.2 (22)
n	213	186	399	182	211	393	365	667	1032	258	736	994

Notes 1. Figures in parentheses indicate cell frequency. 2. Multiple responses considered

Table 12 shows that the use of charcoal/ash to clean teeth decreased to 31.3% from the benchmark of 60.7% in the programme area and to 26% from 62.8% in the comparison area. The reduction was much higher among the NTG households than the TG in the programme area. On the other hand, the use of tooth powder/paste increased substantially from 37.8% to 77.8% in the programme area ($p < 0.001$) and from 26.4% to 68.7% in the comparison area ($p < 0.001$). But the increase was 160 percent higher in the comparison area than 106 percent in the programme. The follow-up status revealed a significant difference between the two areas ($p < 0.001$).

Table 12 Respondents by use of ingredients for tooth cleaning and study area

Ingredients for tooth cleaning	Baseline						Follow-up					
	Programme			Comparison			Programme			Comparison		
	TG	NTG	Total	TG	NTG	Total	TG	NTG	Total	TG	NTG	Total
1	2	3	4	5	6	7	8	9	10	11	12	13
Water only	0.5 (1)	1.1 (2)	0.8 (3)	1.6 (3)	1.9 (4)	1.8 (7)	0.8 (3)	0.2 (1)	0.4 (4)	0	0.8 (6)	0.6 (6)
Charcoal/ash	67.5 (143)	53.9 (99)	60.7 (242)	70.9 (129)	55.9 (118)	62.8 (247)	47.5 (173)	22.5 (150)	31.3 (323)	41.1 (106)	20.7 (152)	26.0 (258)
Branch of tree	9.0 (19)	15.6 (29)	12.0 (48)	17.6 (32)	20.9 (44)	19.3 (76)	7.9 (29)	7.0 (47)	7.4 (76)	17.1 (44)	20.9 (154)	19.9 (198)
Tooth paste/powder	32.0 (68)	44.1 (82)	37.8 (151)	19.8 (36)	32.2 (68)	26.4 (104)	58.9 (215)	88.2 (588)	77.8 (803)	52.3 (135)	74.4 (548)	68.7 (683)
Others	3.2 (7)	2.2 (4)	2.8 (11)	4.4 (8)	4.3 (9)	4.3 (17)	0.3 (1)	0	0.1 (1)	1.6 (4)	0.7 (5)	0.9 (9)
n	213	186	399	182	211	393	365	667	1032	258	736	994

Notes: 1. Figures in parentheses indicate cell frequency. 2. Multiple responses considered. 3. Tooth paste: col. 4 Vs col. 10 $p < 0.001$, col. 7 Vs col. 13 $p < 0.001$, col. 10 Vs col. 13 $p < 0.001$

Discussion

Personal hygiene is instrumental in attaining and maintaining a healthy and disease-free life. It is widely recognised that defaecation in safe place and use of safe water are the prime foundations for improved public health, and conservation of environment which have a reciprocal association with the total development of a society. However, the BRAC approach mostly relied on the software support in terms of informal education for improving the personal hygiene behaviour of the people. It was only in the case of safe defaecation, that BRAC provided hardware support in terms of production and sale of slab latrines, alongside the software support.

Table 13 shows the relative change in major indicator values by study area. The overall analysis of the follow-up study data revealed that the programme area had a higher use of both slab and pit latrines than the comparison area. Both the hardware and software support might have contributed in improving the situation in the programme area. But when the extent of changes from baseline status to the follow-up study

Table 13 Relative change in major indicator values from baseline status to follow-up study status by area (%)

Indicators	Baseline versus follow-up study status	
	Programme	Comparison
Defecation in slab latrines	+53	+83
Use of ash/soap for hand washing after defecation	+21	+68
Presence of ash/soap near latrines (verified)	+10	-5
Baby's stool disposal in specific hole	-15	+121
Baby's stool disposal in specific hole (verified)	+2	+23
Solid waste disposal in specific hole	+16	+48
Tooth cleaning thrice or more a week	+181	+559
Use of tooth paste/powder for tooth cleaning	+106	+160

Note: Minus (-) and plus (+) signs indicate increase and decrease in indicator values

considered, the comparison area has had much higher increase in the use of slab and pit latrines for defecation. This obscures the effect of programme. It seems that the people in the comparison area are likely to be more aware of the benefit of safe latrine use. Washing hands with ash/soap after defaecation was another critical issue of education on personal hygiene. For this, the villagers were motivated to keep ash/soap near the latrines and use for hand-washing after defaecation. Accordingly, the verbally reported practice of washing hands with ash/soap after defecation increased in both the areas, but the rate

of increase was lower in the programme area. The oral responses were verified by the presence of ash/soap near the latrines of the respondents, which would be a proxy indicator of true practice. However, the physically verified result showed that the rate of keeping ash/soap near the latrines increased more in the programme area, in contrast with a decrease in the comparison area. This indicates that the number of true users of ash/soap was higher in the programme area. Another critical issue was that the oral responses on disposing baby's stool in fixed hole decreased from the baseline to 15 percent in the programme area as oppose to an increase by 121 percent in the comparison area. While physically checked the place of stool disposal, the true practice was found to increase to 2 percent in the programme area as against 23 percent in the comparison area. This indicates that the quality of responses was much greater in the programme area that reflects the real situation in practice. The discernible thing here is that reliance on oral responses is risky to draw conclusion especially in case of behaviour change.

There were some indicators in the programme area with lower rates of increase compared to the comparison area, such as, disposal of baby's stool in a fixed place/hole (verified), proportion of respondents cleaning teeth more than thrice or more in a week and using cleaning teeth with tooth paste/powder. In these indicators, the benchmark status of programme area was far higher than the comparison area. Perhaps, improvement in these indicators became plateau in the programme area. Thus to improve the situation to a further extent it may require special inputs. Therefore, programme should take necessary measures to improve these areas of hygiene behaviour.

Issues like hygienic management of solid waste, and carrying water pot by right hand while going to and coming back from latrines have important role in disease transmission. But the status in these indicators declined from the baseline in both the study areas, warranting special emphasis in hygiene education.

Conclusion

On the whole, the data revealed rather a mixed impact of the RHDC intervention on personal hygiene practices. The programme should strengthen the hygiene education to make a significant headway in improving the hygiene practices of the people. Besides,

along with the software support, the programme may think of appropriate hardware supports which are acceptable and affordable to the villagers.

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