Community Involvement In Enhancing Case Detection And Treatment Success Rates Of Tuberculosis Patients Under DOTs Strategy In Pakistan

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Executive Summary

Pakistan has the 8th highest TB burden in the world and the incidence of the disease stands at 181/100,000. It is currently estimated that there are around 1.5 million patients in Pakistan while every year 260,000 new persons develop TB. Recent governmental efforts in intensifying TB Control activity have increased the DOTs coverage in the country from 6% to 46% in 2-3 years without compromising on the quality of care and universal DOTs coverage is expected in the country by the year 2005. It is also widely understood that poverty and Tuberculosis follow each other like a shadow. Tuberculosis usually strikes perosns in their most economically productive years and serves to perpetuate poverty in these individuals. Meanwhile, the Government of Pakistan and provincial Governments in collaboration with WHO and the local communities have started a community-based Basic Development Needs Program (BDN) in selected sites of all the four provincess of the country since 1996. The BDN Programme aims at achieving a better quality of life, with the ultimate goal of attaining good health. It is an integrated approach for socio-economic development based on full community involvement, community organization and self-reliance through self-management and self-financing by the people. As the BDN programme also aims at poverty reduction through increasing literacy, improving health services, skills enhancement and provision of interest free loans for income generation, it offers a unique opportunity for improving the overall quality of life of the Tuberculosis patients and their families. A study was conducted in the Sindh province of Pakistan, in District Dadu to evaluate the role of community involvement in enhancing case detection and treatment success rates of DOTs patients by making the delivery of DOTs more patient-friendly, accesible and affordable to the patients. The community representatives of the BDN Programme were required to ensure that there is no interruption and much less default in the treatment of TB patients so that virtually all the registered patients are cured of the disease and can be useful members of the scoiety

This interevention study aimed at linking DOTS implementation with the BDN programme. The BDN team which was already involved in community mobilization was given training in DOTS implementation and teachers, local councillors and CBO activists were involved.
As seen in the results the baseline case detection rate was the same both in the intervention and control group. However, after intervention in Taluka Sehwan (intervention group) there

was the considerable increase in case detection i.e 52 new cases detected as opposed to 39 in the baseline. A glaring example is the Arazi health center in the intervention group where only 1 case was diagnosed in the first quarter increasing to 10 cases in the third quarter, showing a significiant increase of 64.4%. in the control group where one health center Drigbala at baseline showed a case detection rate of 9 cases in the first quarter and just 11 cases in the third quarter. Taluka Sehwan (inervention group) showed an incidence of 49 cases per 100,000 at baseline which increased to 66 cases per 100,000 in the third quarter. In Arazi case incidence was 4/100,000 much below the estimated case incidence of 181/100,000. Community mobilization through the BDN program helped in improving the case detection to 37/100,000 though less then the estimated incidence of 181/100,000 but still showing of significiant increase. In the control group case detection rate reached an average of 50 cases per 100,000.

An important component of case detection is sputum positivity indicating the expertise of the DOTs implementors. Sputum positivity increased significiantly in the intervention group reaching nearly 35.2% in the third quarter from 19.7% . In one of the health facilities in the control area ,Juhi Health Center, 86 cases were diagnosed on X-ray and not on sputum microscopy and in none of the health centers in the intervention group, diagnosis of TB was based on X-ray findings. Involvement of the BDN programme in DOTS Implementation was a successful experience which can be replicated in other parts also. BDN areas showed a better case detection rate and followup was also better with improved patient compliance. Though the time period for followup was relatively short, the full impact of community involvement could not be assessed. Had the programme continued for a longer time, they could have been identification of more cases and better patient compliance. This pilot project showed the success of BDN involvement in DOTS Implementation and can be replicated in other parts of the country. Based on the results it is recommended that the Government of Sindh and WHO should jointly endeavour to ensure timely approval of projects and release of funds to facilitate program implementation. National and Provincial TB control Programmes should have strong linkages with BDN Programme. DOTS Implemenation should become a formal component of the BDN Programme.

Introduction

Pakistan has the 8th highest TB burden in the world and the incidence of the disease stands at 181/100,000. It is currently estimated that there are around 1.5 million patients in Pakistan while every year 260,000 new persons develop TB. Recent governmental efforts in intensifying TB Control activity have increased the DOTs coverage in the country from 6% to 46% in 2-3 years without compromising on the quality of care and universal DOTs coverage is expected in the country by the year 2005. Through these measures we expect to detect 70% of the cases of Tuberculosis and successfully treat at least 85% of them by 2005. Case detection and treatment has started according to the proper DOTs methodology in more than 40 districts of the country, yet there is a definite need to improve the case detection mechanisms, reduce the current default rates and improve the treatment success rates in order to achieve the national targets. If programme monitoring is improved and the delivery of DOTs made more community-based and patient-friendly the requisite targets can be achieved.

Meanwhile, the Government of Pakistan and provincial Governments in collaboration with WHO and the local communities have started a community-based Basic Development Needs (BDN) Program in selected sites of all the four provincess of the country since 1996. The BDN Programme aims at achieving a better quality of life, with the ultimate goal of attaining good health. It is an integrated approach for socio-economic development based on full community involvement, community organization and self-reliance through self-management and self-financing by the people. DOTs is now in place in all the BDN districts viz., Dadu in Sindh, Mastung in Balochistan, Nowhera in NWFP, Muzafarabad in Azad Jammu, and Kashmir and Multan and Kasur districts in the Punjab. A study was planned to take advantage of an organized community in the BDN areas and study the efficacy of active community involvement on the overall success of the DOTs Programme.

It is also widely understood that poverty and Tuberculosis follow each other like a shadow. Tuberculosis usually strikes perosns in their most economically productive years and serves to perpetuate poverty in these individuals. The WHO Commission on Macroeconomics and Health (CMH) believes that the full economic cost of Tuberculosis within poor communities has often been under-estimated. In fact, the substantial non-treatment costs of these

diseases are often greater, and considerably more far-reaching, than the direct costs of treatment to the health service. As the BDN programme also aims at poverty reduction through increasing literacy, improving health services, skills enhancement and provision of interest free loans for income generation, it offers a unique opportunity for improving the overall quality of life of the Tuberculosis patients and their families.

Objectives

The main objective of the study was to evaluate the role of community involvement in enhancing case detection and treatment success rates of DOTs patients in the BDN area, of District Dadu in the Sindh Province of Pakistan by making the delivery of DOTs more patient-friendly, accesible and affordable to the patients. The community was also educated that TB is a hgihly curable disease in order to remove the stigma attached to the disease and enhance case detection. The community representatives also ensured that there is no interruption much less default in the treatment of TB patients so that virtually all the registered patients are cured of the disease and can be useful members of the scoiety. The main objectives of the study were

1. To test the efficacy of active community involvement through the BDN programme in improving case detection rates and treatment outcomes of Tuberculosis patients.

2. To take advantage of the BDN opportunity and arraignment for TB care by improving the knowledge of the family members of TB patients concerning most important health related issues including Tuberculosis.

3. To modify the Tuberculosis control mechanisms in the light of the above findings with a view to enhance the efficacy of the programme.

Methodology

The study was carried out in the districts of Dadu in the province of Sindh This was a randomized controlled trial. The case detection and spututm conversion rates were compared in the BDN areas and non-BDN areas having similar facilities. The community representatives in Sehwan were encouraged to take on the responsibility of referring TB suspects to the nearest diagnostic center, carrying out direct observation of treatment in diagosed cases, assisting in defaulter tracing and educating the family members of the patients on preventive measures in association with women health volunteers and Lady Health Workers. While other areas in the same districts with comparative health facilities in terms of access, quality of care and other parameters were also included in the study for the trial.

All the TB patients detected in the above areas over the first two quarters of the study were included in the study regardless of any other consideration. The study subjects included community representatives, chairmen of village development committees, women health volunteers and families of the Tuberculosis patients.

This was intended to be a community intervention study design with internal and external control. Initially the cluster representatives and chairmen of the village development committees were given a 1-day orientation session on Tuberculosis control using the DOTs strategy and apprised of their role in this regard in the BDN areas. Women health volunteers, women and youth groups and other community members were also involved in this session, while no such intervention will be carried out in the non-BDN areas of the same district. Case detection and sputum conversions were then observed in the next two quarters and the results evaluated by analysing the quarterly reports of case detection and sputum conversions. The community themselves filed periodical reports of DOTs on the CIS forms. Female members of the target families of TB patients were encouraged to attend vocational training and literacy centers, educate the family members on prevention of TB and other health related activities. The Home Health Care package already developed by the programme was employed for these activities such as immunization of women of child

bearing age and children, provision of regular and continuous family planning, growth monitoring and antenatal services to the same family. The target families were also assisted / supported in upgrading the environmental health and sanitation status, and provision of income generating loans to fight against the disease through a concomitant increase in their financial status. Other avenues of assisting or supporting TB patients through community organization were also explored. The end points of the study were to compare the case detection and sputum conversion rate prior to and after the intervention.

Data Collection methods, instruments used, measurements:

1. Community Information Service (CIS) from the community representatives.
2. Quarterly reports of case detection of TB patients (TB 07) from various diagnostic centers of the district included in the study.
3. Quarterly reports of sputum smear conversions of pulmonary smear positive patients (TB 08) from various diagnostic centers of the district included in the study.
4. Monitoring reports from various investigators.

Under the BDN Reports CIS are received on a periodic basis from the community representatives on a monthly basis. Furthermore, TB 07 and TB 08 reports for DOTs patients are received routinely on a quarterly basis from all diagnostic centers and are consolidated by the District TB Coordinators. During their visits to the study area, the investigators looked into other parameters of the study in addition to the case detection and sputum conversion rates. In view of the limited duration of the research study, the treatment outcomes of the cases registered subsequent to the start of these study cannot be mentioned in the final report, however, they will be assessed subsequently.

<u>Tuberculosis patient:</u>

An active case of tuberculosis refers to symptomatic disease from Mycobacterium tuberculosis complex .

Pulmonary Smear-positive patient:

A patient with - at least two sputum specimens positive for acid fast bacilli(AFB) by microscopy, or one sputum specimen positive for AFB and radiographic abnormalities consistent with active pulmonary tuberculosis as determined by a competent medical officer in the field.

Pulmonary Smear-negative patient:

A patient with at least three sputum specimens negative for AFB by microscopy and radiographic abnormalities consistent with active pulmonary tuberculosis. A Patient who has never had treatment for tuberculosis or has taken anti-tuberculosis drugs for less than four weeks.

This is the quarterly report on new cases and re-treatments of tuberculosis is an important report in the routine recording and reporting system of the TB Control Programme. The report shows the number of new pulmonary smear positive cases, relapses, other re-treatments, new pulmonary smear negative cases, and extra-pulmonary tuberculosis cases that were diagnosed and registered during a quarter (i.e. 3-month period). The Quarterly report on smear conversion is another important report form in the routine recording and reporting system of TB Control Programme. The report indicates how many pulmonary smear positive (new and relapses and other re-treatment) cases, registered 3 to 6 months earlier, have been converted to smear negative (or have died, or defaulted or transferred to another diagnostic center) at the completion of 2/3 months of their initial treatment. The report also records how many sputum smear negative cases, registered 3 to 6 months earlier, have died, or defaulted, or transferred out by the completion of 2/3 months of their treatment.

A research assistant was hired during the course of the study who periodically visited the study areas and later compiled, consolidated and analyzed the data statistically in order to test whether the difference between the findings in the BDN areas and non-BDN areas is statistically significant or otherwise.

The intervention area comprised of the DOTs diagnostic and treatment centers located in Taluka Sehwan while Taluka Johi was taken as the control area . The following were the diagnostic and treatment center in Taluka Sehwan.

1. Civil hospital Sehwan
2. RHC Arazi
3. RHC Bhan
4. RHC Jhangara.

The diagnostic and treatment centers in Taluka Johi were

1. Civil hospital Johi
2. RHC Drigbala.

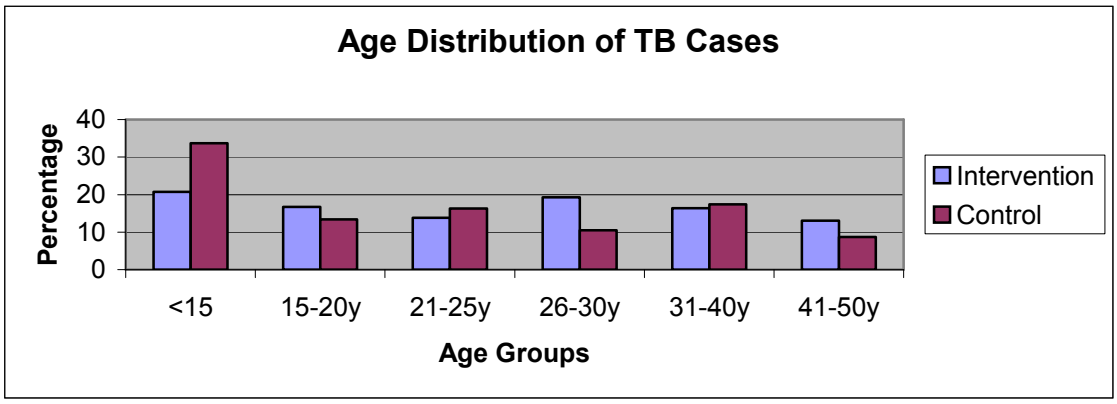
Results

The study waas conducted in Dadu District and the intervention area chosen was Taluka Sehwan, while Taluka Johi was taken as the control area. Quaertely case detection reports were collected from all the areas starting from January 2004.

Table 1. Age Distribution of TB Cases

Age Groups						
	<15	**15-20y**	**21-25y**	**26-30y**	**31-40y**	**41-50y**
Sehwan n	14	13	6	14	9	4
Arazi n	8	8	12	11	13	19
Bhan n	32	24	19	26	22	11
Jhangera n	3	1	1	2	1	2
Johi n	58	18	25	14	26	12
Drigbala n	0	5	3	4	4	3

Figure 1



The age distribution of TB patients shows that most of the TB patient were between 15 to 40 years of age children less then 15 years also counted for 22 to 30% of cases, there were less patient more then 40 years of age then nearly 17% of patients were between 30 to 40 years of age.

Table 2. Sex distribution of TB cases in Intervention and Control group

	Intervention Area				Control Area	
	Sehwan n %	**Arazi** n %	**Bhan** n %	**Jhangera** n %	**Drigbala** n %	**Johi** n %
Male	63(47.4)	10(71.4)	59(71)	38(55.8)	14(53.8)	92(46.7)
Female	70(52.6)	4(28.6)	24(28.9)	30(54.2)	12(46.2)	105(53.2)

The sex distribution of the patients indicated some interesting findings. In the treatment Centres of Arazi and Bhan most of the patients (71%) were predominantly males. Even in Jhangara and Drighbala the proprtion of male patients seen waas more than females. In the more remote areas accesability of female patients to health centres is difficult.

Table 3. Total number of TB cases detected in intervention and control Areas. (January to October 2004)

Number of TB cases				
Areas	**First Quarter n**	**Second Quarter n**	**Third Quarter n**	**Total n**
Intervention Area	81	88	122	291
Control Area	61	79	87	227

Chi square= 8.2 p-value =0.01

In the first quarter, in the intervention group 81 cases of tuberclusis were detected, a slight increased took place on the second quarter whereby 88 additional cases were detected. However, after formidable intervention, in the third quarter 122 new cases were detected, that is 41 more cases than in the first quarter. In the control group, in the first quarter 61 cases were diagnosed which increased to 79 cases in the second quarter. The number of cases in the third quarter was 87 i.e 26 more cases than in the first quarter. Case detection between intervention and control group was significiant ($p<0.01$).

Table 4. Total TB cases detected in TB diagnostic and Treatment Center

	Intervention				Control	
	Sehwan n	**Arazi n**	**Bhan n**	**Jhangara n**	**Drigbala n**	**Juhi n**
First Quarter	39	1	27	14	9	52
Second Quarter	42	3	21	22	6	73
Third Quarter	52	10	35	32	11	76

A breakdown of the number of cases in each center shows that in Sehwan (intervention) at baseline 39 cases were detected in the first quarter while 52 cases were detected in the third quarter, indicating 9.7% increase in the number of cases. Arazi (intervention) only one case had been detected in three month period of baseline, which increasd to 10 cases in the third quarter showing a significiant increase of 64.4%. Again in Bhan (intervention) where 27 cases were detected at baseline, number of cases increased to 35 in the third quarter after intervention (9.6% increase). In Jhangara (intervention) 14 cases were detected in the first quarter increasing to 32 cases in the third quarter indicating a significiant increse of 26.5%.

On the contrary, in the contol group the increase in the cases detection rate was not significiant. In Taluka Juhi (control group) 52 cases were detected in the first quarter increasing to 76 cases in third quarter (12% increase). While in Drigbala only a 7.7% increase in cases took palce, from 9 cases at baseline to 11 cases in the third quarter.

Table 5. Proportion of Sputum Positive cases seen in Intervention and Control Groups

	First Quarter		Second Quarter		Third Quarter		Total	
	n	%	n	%	n	%	n	%
Intervention Area	16	19.7	24	27.2	43	35.2	83	23.5
Control Area	13	21.3	19	24	15	17.2	47	20.7

Chi square = 26.48 **p-value= < .0001**

When we compared the sputum positive cases between the intervention and control groups a significant difference of p-value=<.0001 was seen. In the intervention group, 19.7% cases were sputum positive in the first quarter, increasing to 27.2% in the second quarter and finally to 35.2% in the third quarter. While in the control area sputum positivity was 21.3% in the first quarter declining to 17.2% in the third quarter.

Table 6. Proportion of Sputum Positive and Negative cases in Treatment and Diagnostic centers in Intervention and Control group

	Intervention Area								Control Area				
Sputum positive (+ ve) and negative (-- ve)	Sehwan		Arazi		Bhan		Jhangara		Drigbala		Juhi		Juhi X-Ray Diagnosed cases
	+ n	-- n	+ n	-- n	+ n	-- n	+ n	-- n	+ n	-- n	+ n	-- n	n
First Quarter	8	31	0	1	7	20	1	13	0	9	13	22	17
Second Quarter	9	33	0	3	7	14	8	14	0	6	19	21	33
Third Quarter	16	36	3	7	15	20	9	23	3	8	12	38	36
Total Cases	33	100	3	11	29	54	18	50	3	23	44	81	86

Overall the percentage of sputum positive cases was much less than sputum negative in both the groups. Initially at baseline the proportion of sputum positive cases in Taluka Sehwan (intervention) was 24.2% increasing to 44.4% in the third quarter. In Taluka Arazi where no case was sputum positive in the first quarter it increased to 42% sputum positive in the third quarter. In Bhan (intervention) sputum positivity increased from 35% to 75%. At baseline in Jhangara (intervention) only one case out of 13 cases was sputum positive increasing to 9 cases out of 23 cases becoming sputum positive. In the control area in Drigbala no case was sputum positive at base line and in the third quarter only three cases out of 8 cases was sputum positive.. Infact Taluka Juhi in the control area showed a decline of sputum positive cases from 59% at baseline reducing to 31.8% sputum positivity in the third quarter. It was interesting that in Taluka Johi, 86 cases of tuberculosis were diagnosed on X-ray findings and not on sputum microscopy. As opposed only 44 cases in Taluka Johi were diagnosed on sputum microscopy. In none of the Intervention Group Health facilities, TB diagnosis was made on X-ray only.

Table 7. Distribution of Pulmonary and Extra Pulmonary Tuberculosis cases in Intervention and Control Groups

	Intervention Area								Control Area			
	Sehwan		Arazi		Bhan		Jhangara		Drigbala		Juhi	
	n	%	n	%	n	%	n	%	n	%	n	%
Pulmonary	99	74.4	11	78	82	97.5	51	75	26	100	187	93
Extra Pulmonary	34	25.6	3	22	2	2.5	17	25	0	0	14	7

Both pulmonary and extra pulmonary cases were detected in the intervention and control areas. In Sehwan, Arazi and Jhangara the proportion of extra pulmonary cases was between 22 to 25%. While in the control area 7% cases were extra pulmonary tuberculosis.

Table 8. Incidence of Tuberculosis cases detected in Intervention Area

	Sehwan Incidence Per 100000	Sehwan % of cases detected	Arazi Incidence Per 100000	Arazi % of cases detected	Jhangara Incidence Per 100000	Jhangara % of cases detected	Bhan Incidence Per 100000	Bhan % of cases detected
1st Qtr	49	27.6	4	2	37	20.4	71	39.4
2nd Qtr	53	29.7	11	6	58	30.0	55	30.7
3rd Qtr	66	36.8	37	20.4	85	47.1	97	53.5

Table 9. Incidence of Tuberculosis cases detected in Control Area

	Johi Incidence per100000	**Johi % of cases detected**	**Drigbala Incidence per100000**	**Drigbala % of cases detected**
1st Qtr	37	20.4	41	22.6
2nd Qtr	52	28.7	27	14.9
3rd Qtr	54	29.8	50	27.6

Table 8 and 9 show the incidence of new cases detected per 100,000 population and the percentage of cases detected. In Taluka Sehwan at baseline the incidence of new cases detected was 49/100,000 i.e 27.6% case detection rate. This increased to 66/100,000 and bringing the case detection rate to 36.8%. In Arazi case detection rate at baseline was a mere 4/100,000 which was 2% case detection rate which increased to 37/100,000 in the third quarter. In Jhangara, at baseline case detection was 37/100,000 and went on to 85/100,000 i.e 47.1% cases were detected. A similar picture in Bhan indicated case detection to be 71/100,000 increasing to nearly 53% of cases detected i.e the incidence was 97/100,000.

In the control area, in Drigbala at baseline the T.B case detection was 41/100,000 increasing to 50/100,000 i.e and increasing from 22.6% to 27.6%. In Juhi the baseline case incidence was 37/100,000 i.e 20.4% of cases detected increasing to 54/100,000 i.e 29.8% of cases detected. Hence, in the intervention area in the third quarter percentage of cases increased to nearly 50% of the estimated cases while in the control area it was around 27 to 29% of estimated cases.

Discussion

Tuberculosis (TB) is one of the most important infectious causes of mortality in the developing world. Estimated annual global incidence is 8 million cases and there are 2 million deaths yearly. The total number of TB cases is predicted to increase in all regions up to 2005, with the expected increase of 3% per year on average. Pakistan has the 6th highest TB burden globally and accounts for 44% of the TB burden in the WHO Eastern Mediterranean Region. It is currently estimated that there are around 1.5 million TB patients in Pakistan, while every year 250000 people develop the disease. In Sindh province, 88000 persons get this disease every year, including 44000 smear-positive cases.

TB is considered to be a disease of poverty. TB patients and their families pay the cost of TB in suffering, pain in grief. TB also causes psychological and social costs. TB patients may be rejected by family and friends or lose their jobs. In some societies, TB patients are seen as damaged for life or unmarriageable. Such discrimination can result in anxiety, depression, and reduction in the quality of life. According to WHO estimates, those living in absolute poverty are five times more likely to die before reaching the age of five, and two and half times more likely to die between the ages of 15 and 59, compared to those living in higher-income groups. A less recognized reality is that improved health status can reduce vulnerability and offer a route out of poverty. Both macro and micro-economic studies indicate that better health translates into greater and more equitably distributed wealth by building human capital and increasing productivity. Indeed, healthy children are better able to learn, while healthy breadwinner adults are more able to work and care for their families. The health sector has thus, sufficient benefits and incentives justifying its engagement in poverty reduction initiatives, for which it has to develop both the skills and infrastructures necessary to work in partnership with other sectors and the community. The Health Sector is also succeeding in acting as a catalyst for the incorporation of effective health strategies into national poverty reduction policies and practices. Committed to this effect, the Ministry of Health in Pakistan in collaboration with WHO, provincial and district authorities is supporting the implementation of an integrated Basic Development Needs (BDN) program based on community involvement and supported through intersectoral action of government line departments. This is a self-sustained people oriented strategy that addresses

the diverse basic needs of the community. It recognizes health, as a social goal to be integrated into the strategy of socio-economic development. This program has been implemented with close collaboration of Ministry of Health. It is planned to transfer the program to the concerned Ministry/department through Ministry of Health where PHC Cell-MOH is working as coordinating unit at the country level. Provincial Health Director/Chief Health for planning have been nominated as Provincial Focal Persons to facilitate resources mobilization and expansion of the program.

There is growing interest in the role of communities in TB control. Community health workers play an effective role as treatment supporters as well as help in mitigating the stigmatization of tuberculosis. Community support is extremely essential in new case identification due to the stigma factor people tend to hide their disease and do not initiate treatment. Community volunteers play an active role in providing support to TB patients, helping in enrolling TB patients in the DOTS TB diagnostic and Treatment Centres and play an effective role in ensuring patient compliance. This helps in reducing the default rate and patients who have received support from community volunteers, are more likely to complete treatment.

For successful DOTS implementation, convenient and accessible TB treatment and care are essential. Providing TB care in the community is one approach. The challenge is to do this in ways that contribute to community development and that are effective, acceptable and affordable.

Community participation in primary health care (PHC) is not a new idea. Two important lessons that a TB control can learn from the experience of community participation in other aspects of PHC are:

- Community health workers can play an important role, provided that they receive adequate support, motivation and incentives.
- It is better to work through existing community organizations than to create new ones.

In Sub-Saharan Africa, WHO has coordinated projects to evaluate community contributions to effective TB control at district level in Botswana, Kenya, Malawi, Namibia, South Africa, Uganda and Zambia. Community organizations involved range from churches, NGO's and

HIV/AIDs home-care organizations to community-based distributors of contraceptives and traditional healers. The projects involve identifying and training members of these organizations, and supervising them in supporting TB patients and directly observing treatment.

The BDN Programme in Sindh Province emphasis community development and community mobilization. Village Development Committees (VDCs) have been established in all the union councils of taluka Sehwan and the Clusters Representatives have been identified and trained in all the 8 union councils on the BDN concept and program implementation modalities. The BDN Teams and VDCs have also been trained on program management and social mobilization.

This interevention study aimed at linking DOTS implementation with the BDN programme. The BDN team which was already involved in community mobilization was given training in DOTS implementation and teachers, local councillors and CBO activists were involved.

As seen in the results the baseline case detection rate was the same both in the intervention and control group. However, after intervention in Taluka Sehwan (intervention group) there was the considerable increase in case detection i.e 52 new cases detected as opposed to 39 in the baseline. A glaring example is the Arazi health center in the intervention group where only 1 case was diagnosed in the first quarter increasing to 10 cases in the third quarter, showing a significiant increase of 64.4%. Another health facility, Jhangara Health Center again showed only 14 cases in the first quarter. However, the performance showed a considerable improvement of 26.5% in the third quarter after intervention, on the other hand in the control group where one health center Drigbala at baseline showed a case detection rate of 9 cases in the first quarter and just 11 cases in the third quarter. Taluka Sehwan (inervention group) showed an incidence of 49 cases per 100,000 at baseline which increased to 66 cases per 100,000 in the third quarter. In Arazi case incidence was 4/100,000 much below the estimated case incidence of 181/100,000. Community mobilization through the BDN program helped in improving the case detection to 37/100,000 though less then the estimated incidence of 181/100,000 but still showing of significiant increase. In the control group case detection rate reached an average of 50 cases per 100,000.

Community based intervention studies to improve patient compliance and DOTs implementation have been conducted in many developing countries. In Cape Town, South Africa, a prospective study was conducted in 1998 whereby community health workers provided support for DOTs implementation. Treatment cure rates in the intervention area were much higher in the intervention area (Guguletu) than in the control area (Nyanga) (58% vs. 50%, P=0.0378) and for retreatment cases (47% vs. 35% = 0.0791), treatment success rates were similar. Okello et al in rural Uganda showed that community-based care for new smear positive pulmonary tuberculosis cases resulted in a highly cost effective program as compared to hospital based strategy. Treatment success rates improved from 56% to 74%. Similar results were obtained from South Asia where in Haryana State, India. community volunteer involvement in Urban TB control program treatment success rate was comparable with that of patients receiving DOTs from government health workers (78% vs. 77%). The proportion of patients with community volunteers increased significantly with time (13% in 2000 to 25% in 2002), even in the absence of financial incentives.

An important component of case detection is sputum positivity indicating the expertise of the DOTs implementors. Sputum positivity increased significiantly in the intervention group reaching nearly 35.2% in the third quarter from 19.7% . In one of the health facilities in the control area ,Juhi Health Center, 86 cases were diagnosed on X-ray and not on sputum microscopy and in none of the health centers in the intervention group, diagnosis of TB was based on X-ray findings. Strenthening of laboratory services and improved disgnostics facilities is an important component of the DOTs program and involvement of BDN partners in this helped to improve overall case detection.

The BDN initiative has attracted the attention of many national and international agencies by virtue of its sound philosophy and pragmatic approach of extensive community involvement. As our health system continues its ongoing battle against diseases and poverty alike, the BDN program offers a tangible solution to break the vicious cycle and show the path to overall human development. Efficient implementation and replication of program mechanisms are the tools to success.

Involvement of the BDN programme in DOTS Implementation was a successful experience which can be replicated in other parts also. BDN areas showed a better case detection rate and followup was also better with improved patient compliance. Though the time period for followup was relatively short, the full impact of community involvement could not be assessed. Had the programme continued for a longer time, there could have been identification of more cases and better patient compliance. This pilot project showed the success of BDN involvement in DOTS Implementation and can be replicated in other parts of the country.

Recommendations

In view of the foregoing results , the following recommendations are being made:

1. The Government of Sindh and WHO should jointly endeavour to ensure timely approval of projects and release of funds to facilitate program implementation.
2. Intensive monitoring and supervision is of essence to the program and preferably be carried out by federal and provincial officers with sufficient technical expertise at least on a quarterly basis.
3. Experience sharing may be carried out through newsletter or exchange visits.
4. National and Provincial TB control Programmes should have strong linkages with BDN Programme.
5. DOTS Implemenation should become a formal component of the BDN Programme.
6. BDN Workers should receive formal training in DOTS. This should include community volunteers including teachers, councillors, nazims, community activists etc.
7. BDN Programme with an inbuilt DOTS Component should be replicated in other parts of the country.

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