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TB-DOTS PROGRAM;
APPRAISAL OF ROLE OF LADY HEALTH WORKERS AS TREATMENT SUPPORTERS

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ABSTRACT... Objectives: To assess the performance of Lady Health Workers (LHWs) in collection, storage & distribution of drugs and evaluate their effectiveness regarding TB suspect identification, referral, directly observing the intake of medicine, default identification and health education in TB-DOTS program. **Design:** A cross-sectional study. **Setting:** In district Toba Tek Singh. **Period:** From January to Sep 2006. **Materials & Methods:** One hundred and Two LHWs were selected randomly and interviewed using a structured pre-tested questionnaire. **Results:** Among 102 LHWs, 76.5% were trained in TB-DOTS. Sixty four (62.7%) had qualification matric and above. Collection of the drugs was being performed properly by 87.3%, while 83.4% were storing the anti-TB drugs at proper places. Anti-TB drugs were being distributed to patients daily by 95.1%. Under the direct supervision of LHWs 69.6% of TB patients had completed treatment. In the areas of 58.8% LHWs, TB patients were declared cured after 8 months treatment. Defaulted TB cases were present, in the areas of 19.6% LHWs, while 12.8% of the LHWs had relapsed TB cases in their areas. Most of the LHWs (85.3%) had proper record of medicine and of the patients (84.3%). **Conclusion:** The experienced and TB-DOTS trained LHWs of urban areas, in the age group of 41-50 years had overall good performance. The LHWs having qualification matric and above had better performance than the LHWs having middle qualification. TB-DOTS program in district Toba Tek Singh was working successfully and it should be continued with some improvements and innovations.

Key words: LHWs, TB-DOTS, TB patient, Cured, Defaulted, Relapsed.

INTRODUCTION

Tuberculosis is a specific infectious disease caused by Mycobacterium tuberculosis. The disease primarily affects lungs and causes pulmonary tuberculosis. Tuberculosis can affect intestine, meninges, bones, joints, lymph glands, skin and other tissues of the body. Tuberculosis remains a World-wide public health problem[1]. World Health Organization declared TB a global emergency in 1993 in recognition of its growing influence as a public health problem[2]. Due to the highest number of TB cases per head in South East Asia the situation in these countries is described as a "Time Bomb" awaiting to explode[3]. Nearly one third of the global population i.e. two billion people, are infected with Mycobacterium tuberculosis. More than eight million people develop active tuberculosis every year. Globally

about two million people die with tuberculosis every year[4]. More than 90% of global TB cases and deaths occur in the developing world. Seventy-Five percent of TB cases are in the most economically productive age group (15-54 years). An adult with TB loses on an average three to four months of work time[5]. Global burden of tuberculosis disease in terms of DALYS was about 35.79 million in 2000[6]. Drug resistance is emerging as one of the major challenges in TB management due to inadequate, inappropriate drug regimens and poor compliance[7]. Only one out of seven doctors knows the correct drug regimen for TB treatment[8]. Community health workers can play an important role, provided they receive adequate support, motivation and incentives[9]. Pakistan ranks sixth among the 22 countries with highest TB disease burden & contributes 44% of disease burden in the Eastern Mediterranean Region. There are about 250, 000 new TB cases in Pakistan each year. Many TB patients die because they are either not detected, detected late, inappropriately treated or fail to complete treatment[8]. Pakistan National TB Control Program declared TB as a national emergency in 2001.Pakistan has an incidence of 177/100,000 population or around 250,000 new TB cases every year in which 80/100,000 are sputum smear positive[10]. TB-DOTS has been promoted as a global strategy since the mid 1990's. TB-DOTS program was launched in Pakistan in 1995.The DOTS strategy was launched in the Punjab in the year 2000 as pilot project. TB-DOTS program was started in District Toba Tek Singh in 2001[11].

The target of DOTS is to treat successfully at least 85% of the registered new smear positive TB patients and detect 70% of the estimated incident smear positive cases[8]. Lady Health Workers as treatment supporters are providing TB care in the community. The government of Pakistan launched the National Program for Family planning and primary Health care in 1994. More than 92,000 LHWs are providing family planning and primary health care services to rural population at their doorsteps. In TB-DOTS program LHWs ensure TB patients take medication regularly, in proper dose at the proper time TB-DOTS program now covers almost all districts of Pakistan providing services as "War against TB" to the community through LHWs . Health Workers are the front-line heroes in the fight against Tuberculosis. Identification of a suitable and acceptable treatment supporter for the patient is the key to the success of TB-DOTS Program[12].

Rationale for Study

One undiagnosed / untreated sputum smear positive case infects approximately 10 to15 persons /contacts per year for about two years[8]. Pakistan National TB Control Program and Ministry of health declared tuberculosis a national emergency in 2001[10]. The problem of MDR-TB is very obvious and its treatment is very costly and unsustainable. Reasons for occurrence of MDR-TB is failure to treat simple TB cases due to mismanagement, inadequate and inappropriate treatment. Most of the studies have been carried out in tertiary care hospitals, which do not show the true picture of the problem. This study has been conducted in both rural and urban areas to get the actual results of TB treatment and its outcome in the above communities[13]. Lady health workers are the back bone of TB-DOTS program as treatment supporters and are regarded as key to success of this program. Appraisal of role of LHWs in TB-DOTS program at grass root level regarding their performance and effect of their supervision on treatment compliance and outcome is very important. This study has been executed to assess the effectiveness of TB-DOTS treatment supervised by LHWs in the community for prevention and control of tuberculosis[8].

METHODOLOGY

A cross-sectional study was conducted in district Toba Tek Singh (Pakistan) from January to September 2006. A structured pre-tested questionnaire and check list was developed in English language for interviewing LHWs,

Working in TB-DOTS program and registered TB patients being treated under their direct supervision. The questionnaire was translated into Urdu language and then back to English language to remove ambiguities of English language. Total 1135 LHWs and 1700 registered TB patients were present in district Toba Tek Singh were the study was started. Sample size was calculated by Epi-Info. Using simple random sampling technique and drawing lots from each tehsil of district Toba Tek Singh, sample size was achieved according to their population. 102 Lady Health Workers was the sample size calculated by Epi-Info. With each Lady Health Worker one TB patient had to be interviewed. Total 102 Lady Health Workers were interviewed by prior informed written consent, but only 90 TB patients were interviewed, because other patients were not available due to different reasons. The questionnaire included the socio-demographic and dependent variables of Lady Health Workers and TB patients like age, residence, marital status, education, duration of service, training in TB-DOTS and monthly income, number of TB suspects identified by LHW, number of TB suspects referred to health facility, number of confirmed cases, Treatment completed cases, Drug complication cases, Failure cases, Relapse cases, Defaulter cases, Re-treatment cases, Drug resistance cases, Deaths, Drug supply, Drug storage, Drug distribution. The questionnaires were filled up under the direct supervision of the Principal investigator with the help of the support staff and paramedics.

Standards of Lady Health Workers performance

There are seven standard essential components of treatment support.

- Collect tablets, on monthly basis, and safely store.
- Directly observe intake of tablets (in right number of drugs and dosage).
- Record daily intake of drug in Treatment Support Card.
- Understand the need for the patient visit to diagnostic center at the completion of intensive phase.
- Identify possible side effects and refer.
- Discuss difficulties in continued treatment and help to resolve them.
- Trace and help to retrieve late patients.

DATA ANALYSIS

SPSS-10 software was selected for processing and analysis of data. After completing the data entry process, data cleaning was performed. Chi-square and Fisher's exact test was applied for qualitative variables. The significance level was fixed (P= 0.05) at 95% confidence level.

RESULTS

Thirteen (12.7%) LHWs were of the age between 41-50 years and the proportion of overall good performance by this age of LHWs is significantly better than all other ages, as p-value is 0.02. Seventy-two(70.6%) LHWs were married and there is no statistically significant different performance by married LHWs than unmarried. 54(52.9%) LHWs were matric, 38(37.3%) were middle and 10(9.8%) were post-matric, the effect of educational status of LHWs to the overall performance is not statistically significant as p-value is 0.12 but socially it is a strong evidence to reject the hypothesis that the probability is equal. Ninety-five (93.1%) LHWs had income of less than Rs.2000/- per month and 7(6.9%) LHWs had Rs.2000/- and above, the p-value is 0.343 on overall performance. 54(52.9%) LHWs belonged to rural areas and 48(47.1%) to urban areas, the proportion of overall good performance by Urban LHWs is 90% and by Rural is 74% with p-value 0.045. Thirty-four (33.3%) LHWs had working experience of 1- 4 years and 68(66.6%) had experience of more than 5 years. The proportion of overall good performance by less than 5 years working experience LHWs is 70.6% and by 5 years and above working experience is 86.8%, the difference

is statistically significant as p-value is 0.048. 76(74.5%) LHWs had catchment population between 1000-1500 individuals. Most of the LHWs 78(76.5%) had got training in TB-DOTS and 24(23.5%) had not got training in TB-DOTS with p-value 0.000. Training manual was available with 84 (82.4%) LHWs at the time of interview and was not available with 18(17.6%) LHWs with p-value 0.005 on overall performance table-I.

Table-I. Comparison of the overall performance of LHWs

Parameter	Categories	Good	Satisfactory & below	Total	p-value
Age	20-30 years	38 (74.5%)	13 (25.5%)	51 (50%)	0.02
	31-40 years	33 (86.8%)	5 (13.2%)	38 (37.3%)	
	41-50 years	12 (92.3%)	1 (7.7%)	13 (12.7%)	
Marital status	Married	58 (80.6%)	14 (19.4%)	72 (70.6%)	0.74
	Unmarried & others	25 (83.3%)	5 (16.7%)	30 (29.4%)	
Educational status	Middle	28 (73.7%)	10 (26.3%)	38 (37.3%)	0.12
	Matric & above	55 (86%)	9 (14%)	64 (62.7%)	
Monthly income	< Rs. 2000	76 (80%)	19 (20%)	95 (93.1%)	0.343
	Rs. 2000 & above	7 (100%)	0 (0%)	7 (6.9%)	
Working experience	< 5 years	24 (70.6%)	10 (29.4%)	34 (33.3%)	0.048
	5 years and above	59 (86.8%)	9 (13.2%)	68 (66.7%)	
Training	Training received	70 (90%)	8 (10%)	78 (76.5%)	0.000
	No training	13 (54%)	11 (46%)	24 (23.5%)	
Availability of training manual	Training manual available	73 (87%)	11 (13%)	84 (82.4%)	0.003
	Not available	10 (55.6%)	8 (44.4%)	18 (17.6%)	
Area	Rural	40 (74%)	14 (26%)	54 (52.9%)	0.045
	Urban	43 (90%)	5 (10%)	48 (47.1%)	

Most of the LHWs 89(87.3%) were collecting anti-TB drugs on monthly basis and 85(83.4%) LHWs were storing the anti-TB drugs in the almirah or in their medicine kits. Majority 97(95.1%) LHWs were distributing the anti-TB drugs daily and 101(99.0%) LHWs were identifying the TB suspects and referring them to the nearest health facility for diagnosis and treatment. Ninety-three (91.2%) LHWs had sputum smear positive TB cases in their catchments areas. and 96(94.1%) LHWs were providing directly supervised treatment to TB patients. Under direct supervision of 71(69.6%) LHWs, TB patients had completed treatment. In the area of 60(58.8%) LHWs ,TB patients were declared cured after 8 months treatment table-II).

Table-II. Distribution of LHWs according to TB suspect identification, referral and treatment					
LHWs \ Parameters	**With no case**	**With one case**	**With two cases**	**With more than two cases**	**Total**
Number of TB suspect identification in one year by LHWs	01	49	25	27	101
Referred to nearest medical facility by LHWs	01	49	25	27	101
Sputum smear positive	09	46	27	20	93
Directly supervised treatment in one year	06	51	22	23	96
Complete supervised treatment	31	43	19	09	71
Cured after complete eight months treatment	42	37	14	09	60

Seventeen (16.6 %) LHWs had multi-drug resistance (MDR) TB cases in their catchment's areas and 16(15.7%) LHWs had cases of drug reaction. Twenty (19.6%) LHWs had cases of defaulted TB treatment and 13(12.8%) LHWs had relapsed TB cases. In the areas of 14(13.7%) LHWs, TB cases were transferred out and in the areas of 9(8.9%) LHWs, TB cases were transferred in from other areas. In the areas of 10(9.8%) LHWs, 10 TB patients died during the course of TB treatment. In the areas of 6(5.9%) LHWs ,6 patients died due to tuberculosis but not taking anti-TB drugs table-III).

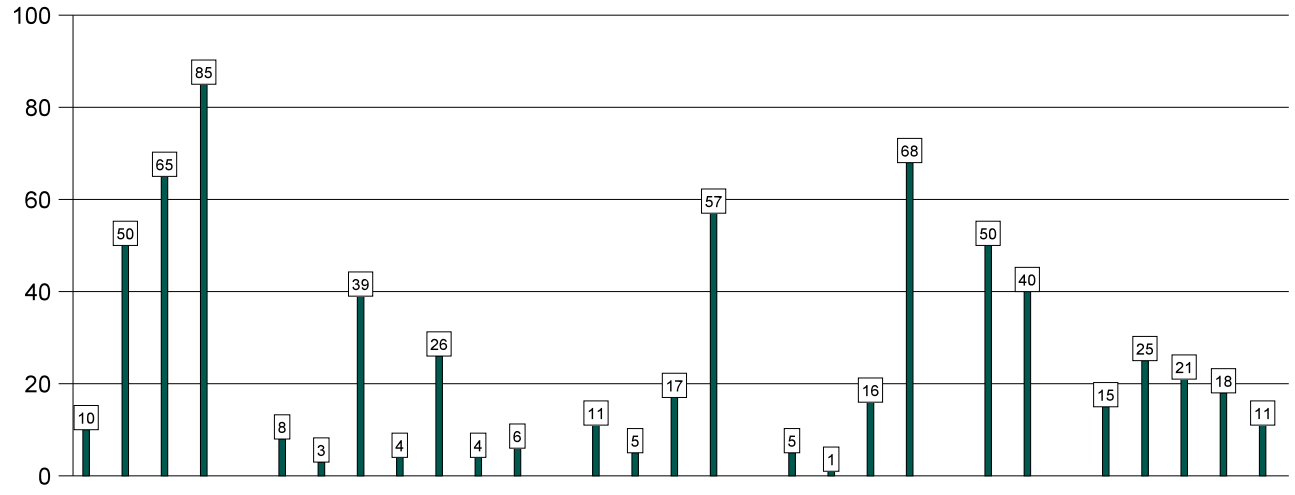
Majority 87(85.3%) LHWs had proper record of medicine and 86(84.3%) had proper record of the patients. Majority 88(86.3%) LHWs were sending the reports of medicine and patients to concerned authorities table-IV).

Eighty seven 85.3%) LHWs were giving health education about intake of food & nutrition, medicine and to take preventive measures to save others from infection. Fifty-three (52%) LHWs gave suggestions and comments about provision of extra allowance, transport, training in TB-DOTS and availability of anti-TB medicine. The average age of TB patients was 39.7 years. Female population of TB patients was 50(55.6%) and male TB patients were 40(44.4%). Sixty-eight (75.6%) patients were married and 57(63.3%) patients were illiterate. Thirty-nine (43.3%) patients were laborers and 57(63.3 %) TB patients had monthly income between RS.2000-3000.(Fig-1).

Thirty-eight (42.2 %) TB patients had history of contact, 86(95.6%) history of cough for three weeks or more and 60(66.7%) had blood in their sputum. Eighty-seven (96.7%) patients had sputum microscopy for AFB and 89(98.9%) patients had their chest x-ray examination. Majority of TB patients 89(98.9%) were taking anti-TB medicine daily and 78(86.7%) were getting anti-TB medicine free of cost. Most of the TB patients 77(85.6%) had with them the treatment support card and 86(95.6%) had been consulted about their choice of treatment supporter.

Thirty-eight (42.2%) patients commented that TB-DOTS was a good program and it should be continued. Food should be supplied and transport facility may be provided to TB patients to reach the health facility. Program was beneficial for the poor patients.

Fig-1. Distribution of TB patients with respect to Age, Sex, Marital status, Educational status, Occupational status, Monthly income



Rs. >3000 = 10	Rs. 2000 to 3000 = 50	Rs. <2000 = 13	No income = 10
Jobless = 8	Employee = 3	Labourer = 39	Student = 4
House wife = 26	Skilled worker = 4	Farmer = 6	
Matric & above = 11	Middle = 5	Primary = 17	Illiterate = 57
Widowed = 5	Divorced = 1	Unmarried = 16	Married = 68
Female = 50	Male = 40		
> 50 years = 15	40-50 years = 25	30-40 years = 21	20-30 years = 18
< 20yeasrs = 11			

Table-III. Distribution of LHWs according to treatment defaulted, relapsed, transferred, death cases, drug resistance / failure and drug complications

LHWs \ Parameters	With no case	With one case	With two cases	With more than two cases	Total
Drug resistence / failure cases detected in the catchment	85	13	03	01	17
Cases had drug reaction / complication	86	14	02	0	16
Defaulted cases	82	16	04	0	16
Relapse cases	89	11	02	0	20
Transferred out	88	11	03	0	14
Transferred in	93	07	02	0	09
Cases died during the course	92	10	0	0	10
Cases died due to TB (not taking anti TB drug)	96	06	0	0	06

Majority of LHWs 90(88.2%) welcomed the patients in their health houses and had satisfactorily identified them by their family names and had separate glass available for TB patients for drinking water and taking medicine. Forty (39.2%) LHWs were observing personal protection and 89(87.3%) LHWs had friendly and cooperative behavior with TB patients. Sanitary condition of 92(90.2%) health houses was good. Ninety-five (93.1%) LHWs had adequate supply of anti-TB medicine and 93(91.2%) were charging no fee or cost of medicine from TB patients.

Table-IV. Distribution of LHWs according to recording and reporting of TB patients and medicines

Recording and reporting of TB patients	Yes	No
Recording of medicine intake of patient in treatment support card	86	16
Proper record keeping of medicine	87	15
Proper record keeping of the patient	86	16
Sending of report of medicine and patients to concerned authorities	88	14

DISCUSSION

Performance of LHWs was better with increasing age and this difference was statistically significant. Performance of TB- DOTS trained LHWs was significantly better than the untrained LHWs.. There was a significantly better performance of LHWs working in urban areas than the LHWs of rural areas. Similarly performance of LHWs with experience of 5 years and more was better than LHWs with less than 5 years experience. The results of the present study of TB-DOTS program are encouraging as compared to previous studies.

A study was conducted in 2002 by J.A. Khan, A Malik, Department of medicine, The Aga Khan University, Karachi, on private practitioners listening to usual complaints of patients, fever, cough and weakness for over two weeks, consider a diagnosis of active tuberculosis. The study showed that only 66% Private Practioners (PPs) ordered sputum microscopy as the preferred method for diagnosing[14].But in the present study ,99% of LHWs referred the TB suspects to nearest health facility for diagnosing by sputum microscopy. In Karachi study only 50% private practioners thought themselves as capable enough to treat patients with pulmonary TB. Only 21% doctors prescribed a correct regimen in accordance with NTP or WHO guidelines[14], but the result of the present study was, 69.6% LHWs had patients who had completed directly supervised treatment and in the areas of 68.8% LHWs the patients were declared cured after completing 8 months anti-TB treatment. In the catchment areas of 17(16.6%) LHWs, drug resistance cases of pulmonary tuberculosis were detected and registered in district Toba Tek Singh. In two studies in Karachi alone, the primary resistance rates for the 4 first line drugs increased to 27%, 15%, 11% and 13% respectively in 1996[14], But in this study the drug resistance cases were less and situation was better than in 1996.

A study conducted by Dr. Mat.Zuki Mat Jaeb of Institute of Respiratory medicine, Kuala Lumpur, Malaysia shows the TB treatment outcomes. In 2004 , 31% patients completed the treatment, 42% were cured, 10% died and 5% transferred out or lost to treatment. There were hardly any treatment failures. This study was under DOTS covered areas. DOTS strategies were introduced in Malaysia in 1999[15]. In the present study, in TB-DOTS program of district Toba Tek Singh, 69.6% TB patients completed treatment, 59.8% were declared cured, 9.8% died and 13.7% transferred out. In the present study treatment completion and cure rate of TB patients was better, death rate was nearly equal and transferred out rate was more than Malaysia.

Ninety patients out of total 102 were available at the health facilities during interview for the present study. The overall mean age of TB patients was 39.7 years in district Toba Tek Singh. A study by H. Rizvi and his colleagues of Department of Thoracic Medicine, Jinnah Postgraduate Medical Centre Karachi was conducted from December 1999 to May 2000, which included all the patients presenting with pulmonary tuberculosis at the Department of Thoracic Medicine. There were total 103 patients, 67 were young adults and their mean age was 30.63 years and 36 were elderly patients having mean age 65.92 years[16].

In the present study 42.2% of patients had previous history of contact with TB patients, while 95.6% of patients had history of cough that lasted for three weeks or longer. Majority of patients 66.7% had history of blood in their sputum (haemoptysis), while 87% of patients had undergone sputum smear examination from the laboratory and 98.9% of patients had undergone X-Ray examination. In the study by N. Zaidi JPMC, Karachi in the period from December,1999 to May 2000, the findings were as follows. The cough was present in 98.3% of the young patients and 94.4% of elderly patients. Sputum was present in 85.1% of young patients and 73.0% of elderly patients. In the younger age group 46.3% patients had Blood in the sputum (haemoptysis) and 21.6% of elderly patients had blood in their sputum. Above 98.0% patients had undergone X-Ray examination and had positive findings[16]. The present study and study of N. Zaidi of JPMC Karachi has not significant differences in demographic and clinical findings[16]. In the present study defaulted TB cases were present, in the areas of 19.6% LHWs, which was a high default rate , However similar default rate of TB patients was noted by Saddique MA, of Institute of Chest Diseases, Aga Khan University Karachi. He found 21% default rate, which is comparable to the finding of this study[17].

CONCLUSION

The LHWs having age between 41 - 50 years, education matric and above, monthly income RS.2000 and above, having working experience and training in TB-DOTS and belonging to urban areas had overall good performance.

Conclusion was that TB-DOTS program in district Toba Tek Singh was working successfully and it should remain continued with some improvements and innovations.

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