Original Article

Evaluation of Primary Health Care service participation in the National Tuberculosis Control Program in Qalyubia Governorate, Egypt

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Abstract
Objective: The aim of this work was to evaluate the Primary Health Care service performance in National Tuberculosis Control Program in Qalyubia Governorate.

Methods: The studied area (Qalyubia Governorate) includes 8 health territories (each contains 5 primary care units/centers).

A questionnaire based on 6 parameters was used to evaluate the PHC system performance: I – Physicians with basic knowledge about TB (causative agent, methods of spread, clinical picture, essential steps in investigations: X-ray and sputum smear), II – Facilities for primary investigation (sputum examination and chest X-ray), III – Communication with the central health authorities or a TB specialist, IV – Proper recording systems needed for proper patient management and follow up, V – Follow up schedules are available for the detected patients, VI – Have a role in community education about the disease. The data obtained were tabulated and statistically analyzed.

Results: Studied area included 8 health territories and 40 primary care units (35% were urban and 65% rural) with one physician in each unit. The mean percent of the correct answers of the basic knowledge score was 48.2% (range = 18%–100%), higher in urban units physicians than rural units physicians, with lack of proper laboratory (for sputum analysis) or X-ray apparatus. Communication with central health authorities in urban areas was higher than rural areas (65.4% versus 57.1%). Case recording was lower in urban than rural areas (42.9% versus 46.2%). Patient follow up after referral to central health units was higher in rural than urban areas (11.5% versus 7.1%). Participation of community education was 78.6% in urban units and 76.9% in rural units.

This work was primarily carried out in: Qalyubia Governorate, Egypt.

Abbreviations: TB, Tuberculosis; MTB, Mycobacterium tuberculosis; WHO, World Health Organization; PHC, Primary Health Care; NTP, National Tuberculosis Program.

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Conclusion: In Qalyubia Governorate, PHC physicians lack proper knowledge about TB and their units lack proper equipments (Lab and CXR). The PHC system needs to be empowered by the health care authorities through training and equipments for better performance in NTP.

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Introduction

World Health Organization (WHO) Stop TB Strategy explicitly acknowledges that effective and sustainable TB control relies on the general health system, especially on well-functioning Primary Health Care (PHC). Weak health systems pose many barriers to effective TB control [1].

PHC providers should follow the regulations within their country. Good communication with PHC services can be very useful in detecting and treating patients with tuberculosis (TB). Since PHC providers are the patient’s first contact with medical services, the initial suspicion of TB most frequently occurs at the PHC level. When a PHC provider encounters a patient with symptoms indicating TB, he or she should examine the patient, take a medical history, and order sputum smear examination and X-ray (or refer to a provider who can carry out these steps). Referral of a suspected TB case by PHC to specialist can avoid escape of diagnosis of TB case. If TB cases escape suspicion and direction into the right way of medical service spread of the disease and development of bacterial resistance can occur [2].

Aim of the work

Evaluation of the participation of Primary Health Care service in National Tuberculosis Control Program in Qalyubia Governorate.

Methods

The studied area (Qalyubia Governorate) includes 8 health territories (each contains 5 primary care units/centers). According to the Egyptian NTP, (2012) [3] and WHO European region guidelines, (2004) [4], the PHC system should have:

(I) Physicians with basic knowledge about TB (causative agent, methods of spread, clinical picture, essential steps in investigations: X-ray and sputum smear).
(II) Facilities for primary investigation (sputum examination and chest X-ray)
(III) Communication with the central health authorities or a TB specialist.
(IV) Proper recording systems needed for proper patient management and follow up.
(V) Follow up schedules are available for the detected patients.
(VI) A role in community education about the disease.

This study evaluated the above 6-parameters to check if they have met the required criteria using the following questionnaire system:

The basic knowledge is assessed through 11 questions, giving 1 for a positive answer and 0 for a negative or inconclusive one.

These questions are:

(1) What is tuberculosis?
- Infectious disease of the lung caused by tubercle bacilli characterized by lung destruction and fibrosis (1).
(2) What is the causative agent?
- Mycobacterium tubercle bacilli (1).
(3) What are the types of TB? (Pulmonary and extra-pulmonary).
(4) What are the methods of spread? (Droplet, cough and sneezing).
(5) What are the main symptoms? (Cough expectoration, hemoptysis, fever and sweating especially at night)
(6) What are the main signs? (General: weight loss and fever and local: consolidation or fibrosis in upper lobes with or without cavitations).
(7) How to suspect extra-pulmonary TB? (Enlarged cervical L.N, chronic skin ulcers, spine deformity or cold abscesses).
(8) What will you do if you suspect a pulmonary TB case? (Sputum for acid fast bacilli, chest X-ray, refer to specialist or central hospital).
(9) What are the main signs in X-ray? (Upper lobe infiltration, fibrosis with or without cavitations).
(10) If sputum smear is negative and X-ray suggestive of TB what will you do? (Refer to a central chest hospital or a specialist).
(11) What are the main drugs used in treatment? (INH, Rifampicin, Pyrazinamide, Ethambutol and Streptomycin).

Facilities for case detection and treatment:

(1) Does a working lab for sputum smear exist?
- Yes (1). - No (0).
(2) Does a working X-ray apparatus exist?
- Yes (1). - No (0).
(3) DOTS application?
- Yes (1). - No (0).

Communication with central health authorities or a TB specialist:

- Yes (1). - No (0).

(1) What are the methods of communication?
- Phone, net or send patients with reports.
(2) What is the type of health authorities?
- Ministry of health related hospitals such as central-teaching- chest or fever hospitals.
- University hospitals.

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Proper recording systems for proper patient management and follow up:
- Yes (1). - No (0).

- The minimum recorded items required: Name – Age – Sex – Address – Registration Number – Referral site – How suspected (signs and symptoms) – Sputum and CXR results – Diagnosis – treatment given – Follow up and outcome.

Follow up patients after referral to central health units:
- Yes (1). - No (0).

- How do you make follow up?
  - By phone, by visits to the patient or by patient visit to the primary care units.

Role in community education:
- Are there any ways to communicate with and educate the public about TB? - Yes (1). - No (0).
  - Where do you make these communications?
    - At the primary care units, Youth clubs and collections or during infectious disease prevention campaigns.

Statistical analysis

Collected data were tabulated and analyzed using SPSS version 16 software (Spss Inc, Chicago, IL). Categorical data were presented as numbers and percentages while quantitative data were expressed as mean and standard deviation. Chi square test ($\chi^2$), or Fisher’s exact test, Spearman’s correlation coefficient (rho) and Man Whitney U test were used as tests of significance. The accepted level of significance in this work was stated at 0.05 ($P < 0.05$ was considered significant).

$P$ value $> 0.05$ insignificant
$P < 0.05$ significant
$P < 0.001$ highly significant

Results

The studied area included 8 health territories and 40 primary care units (centers) with one physician in each unit. Urban territories comprised 14 units (35%) and rural territories comprised 26 units (65%). Only 139 patients were recorded in all units (Table 1).

(I) Basic knowledge about the disease (causative agent, methods of spread, clinical picture, essential steps in investigations: X-ray and sputum smear):

The percent of the correct answers of the basic knowledge score ranged from 18% to 100%, with a mean of 48.2% (Table 2).

Physicians in urban areas had higher scoring in basic knowledge than physicians in rural areas (Table 3).

(II) Facilities for primary investigation (sputum examination and chest X-ray):

There was no working lab for sputum analysis or X-ray apparatus in all studied health units/centers but DOTS was applied in all units/centers (Table 5).

(III) Communication to central health authorities or a TB specialist:

The communication with central health authorities in urban areas was higher than rural areas (65.4% versus 57.1%). Patient follow up after referral to central health units was higher in rural than urban areas (11.5% versus 7.1%) although 88.5% of rural and 92.9% of urban patients were not followed up (Table 6 and Fig. 2).

The communication with central health authorities (Table 7) was highest in Tokh, Shebene Elkanater and Elkanater (80%) then in Benha, Kaf Shokr and Shubra (60%) and lowest was in Elkhanka and Qalioub (40%).

(IV) The availability of proper recording system:

The availability of recording system (Table 6 and Fig. 2) was lower in urban than rural areas (42.9% versus 46.2%). The availability of recording system (Table 8) was higher in Tokh and Elkanater (60%) than in Benha, Kaf Shokr, Shebene Elkanater, Qalioub, Shubra and Elkhanka (40%).

(V) Follow up schedules for the detected patients:

The patient follow up after referral to central health units was highest in Benha (40%) followed by Shebene Elkanater and Qalioub (20%), while there was no follow up (0%) for patient in Kaf Shokr, Tokh, Elkanater, Shubra and Elkhanka (Table 9).
A role in community education about the disease:

The participation of both rural and urban units in community education (Table 6 and Fig. 2) about TB was nearly equal (76.9% versus 78.6%).

The participation of community education (Table 10) was highest in Tokh, Shebine Elkanater and Shubra (100%) followed by Kafr Shokr and Elkanater (75%) then Qalioub and Elkhanka (60%), and lowest in Benha (40%).

Discussion

Egypt has succeeded to achieve the global target occupying a place in the target zone. It is classified as one of 36 worldwide countries that have achieved the global targets in both case detection and treatment success in year 2007. The case detection rate of positive cases in Egypt was 72% (global target is 70%) and treatment success rate was 87% (global target is 85%). Moreover, efforts going on in Egypt did not stop at this, but keep stepping ahead on the target of disease eradication (Global TB Report, 2009) [5].

Primary Health Care (PHC) is the first level of contact of individuals, the family and community with the national health system. PHC brings health care as close as possible to where people live and work, and constitutes the first component of a continuing health care process [4].

The aim of this work was to evaluate the Primary Health Care service performance in National Tuberculosis Control Program in Qalyubia Governorate.

The studied area includes 8 health territories and 40 primary care units (centers) with one physician in each. Urban territories comprised 14 centers (35%) and rural units comprised 26 units (65%) with only 139 TB patients being recorded in all, although there were 1793 patients in the last 5 years in Elqalyubia Governorate according to the Egyptian NTP (Table 1, Fig. 1).

Although there is no golden rule that can be invoked with respect to the rate of doctors available to the population, World Health Organization (WHO) considers that the countries that have less than 23 doctors for every 10,000 people will
not be likely able to achieve coverage rates of adequate Primary Health Care services. In Egypt the rate is 24 doctors for every 10,000 people versus 32 doctors for every 10,000 people in Europe [6].

According to Egypt Human Development Report in 2010 (no available up-to-date report), the average number of doctors per 10,000 people was 3.7 in Qalyubia Governorate [7].

This lower number of doctors per 10,000 people in Qalyubia Governorate is far away from giving adequate services in NTP.

Tshitangano et al. [8] analyzed factors associated with TB control at Mutale health sub district in the Limpopo Province of South Africa, using a cross-sectional descriptive study. They found 72 professionals (24 physician and 48 nurses), managing 66 TB patients in 22 PHC clinics. Better outcome (>85% cure rate) was seen in 9 of the 22 clinics with

<table>
<thead>
<tr>
<th>Area Variable</th>
<th>Rural ($N = 26$)</th>
<th>Urban ($N = 14$)</th>
<th>Total ($N = 40$)</th>
<th>$X^2$/Fisher’s $P$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Communication With central health authorities</td>
<td>No 9 34.6%</td>
<td>Yes 17 65.4%</td>
<td>15 37.5%</td>
<td>0.26 0.61</td>
</tr>
<tr>
<td>Case recording system</td>
<td>No 14 53.8%</td>
<td>Yes 12 46.2%</td>
<td>22 55.0%</td>
<td>0.04 0.84</td>
</tr>
<tr>
<td>Follow up patient after referral to central health units</td>
<td>No 23 88.5%</td>
<td>Yes 3 11.5%</td>
<td>26 90.0%</td>
<td>– 1.0</td>
</tr>
<tr>
<td>Participation in community education</td>
<td>No 6 23.1%</td>
<td>Yes 20 76.9%</td>
<td>26 77.5%</td>
<td>– 1.0</td>
</tr>
</tbody>
</table>

**Table 6** Communication with central health authorities, case recording, patient follow up and participation in community education in studied area: urban versus rural.

**Table 7** Comparison among the studied territories regarding communication with central health authorities or a TB specialist.

<table>
<thead>
<tr>
<th>Communication territory</th>
<th>No N</th>
<th>%</th>
<th>Yes N</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Benha</td>
<td>2</td>
<td>40</td>
<td>3</td>
<td>60</td>
</tr>
<tr>
<td>Kafr Shokr</td>
<td>2</td>
<td>40</td>
<td>3</td>
<td>60</td>
</tr>
<tr>
<td>Tokh</td>
<td>1</td>
<td>20</td>
<td>4</td>
<td>80</td>
</tr>
<tr>
<td>Shebine Elkanater</td>
<td>1</td>
<td>20</td>
<td>2</td>
<td>40</td>
</tr>
<tr>
<td>Qalioub</td>
<td>3</td>
<td>60</td>
<td>1</td>
<td>20</td>
</tr>
<tr>
<td>Elkanater</td>
<td>1</td>
<td>20</td>
<td>2</td>
<td>40</td>
</tr>
<tr>
<td>Shubra</td>
<td>2</td>
<td>40</td>
<td>3</td>
<td>60</td>
</tr>
<tr>
<td>Elkhanka</td>
<td>3</td>
<td>60</td>
<td>2</td>
<td>40</td>
</tr>
<tr>
<td>Total</td>
<td>15</td>
<td>37.5</td>
<td>25</td>
<td>62.5</td>
</tr>
</tbody>
</table>

$X^2 = 4.16$, $P = 0.76$

**Table 8** Comparison among the studied territories regarding availability of a recording system.

<table>
<thead>
<tr>
<th>Territory</th>
<th>No N</th>
<th>%</th>
<th>Yes N</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Benha</td>
<td>3</td>
<td>60</td>
<td>2</td>
<td>40</td>
</tr>
<tr>
<td>Kafr Shokr</td>
<td>3</td>
<td>60</td>
<td>2</td>
<td>40</td>
</tr>
<tr>
<td>Tokh</td>
<td>2</td>
<td>40</td>
<td>3</td>
<td>60</td>
</tr>
<tr>
<td>Shebine Elkanater</td>
<td>3</td>
<td>60</td>
<td>2</td>
<td>40</td>
</tr>
<tr>
<td>Qalioub</td>
<td>3</td>
<td>60</td>
<td>2</td>
<td>40</td>
</tr>
<tr>
<td>Elkanater</td>
<td>2</td>
<td>40</td>
<td>3</td>
<td>60</td>
</tr>
<tr>
<td>Shubra</td>
<td>3</td>
<td>60</td>
<td>2</td>
<td>40</td>
</tr>
<tr>
<td>Elkhanka</td>
<td>3</td>
<td>60</td>
<td>2</td>
<td>40</td>
</tr>
<tr>
<td>Total</td>
<td>22</td>
<td>55</td>
<td>18</td>
<td>45</td>
</tr>
</tbody>
</table>

$X^2 = 1.2$, $P = 0.99$

**Figure 2** Communication with central health authorities, case recording, patient follow up and participation in community education in studied area: urban versus rural.
higher number of trained physicians and nurses, which stresses on the importance of adequate number of well trained physicians and nurses in PHC units for proper TB control.

(I) In our study, basic knowledge (Tables 2–4 and Fig. 1) of the studied physicians about TB (the percent of the correct answers of TB questionnaires), ranged from 18% to 100%, with a mean of 48.2% which is too variable while qualification.

The wide variation of TB basic knowledge score seen in our results means that some areas will have a drop in TB control due to the fact that central health authorities are located in the urban areas.

In the present study, basic knowledge of the studied physicians according to area: urban versus rural, revealed that physicians in urban areas have higher scoring in their basic knowledge than physicians in rural areas, although the difference was not significant. Being in one country, PHC physicians whether in rural or in urban areas must have a standard qualification.

TB control programs should provide leadership in TB education in the community. To determine needs for training and education, TB control programs should monitor the level of knowledge about TB among health-care providers, policymakers, and other community members who provide services to TB patients [11].

(II) In this work, the availability of facilities for case detection in the studied health units/centers revealed that there was no working lab for sputum analysis or X-ray apparatus in all studied health units/centers but DOTS was applied in all units/centers (Table 5).

Availability of diagnostic tools for new cases of TB especially X-ray and sputum smear examination [12]. Being the first person faced with a TB case, PHC physician is able to diagnose cases early by doing smear staining for acid fast bacilli.

Lack of such simple diagnostic tools in primary care will delay diagnosis, helping spread and development of resistance in TB cases which imparts a great cost and hazard in managing such cases with delayed diagnosis [13]. The absence of such simple diagnostic tools and personnel trained on their use in Qalyubia Governorate reflects another big defect in disease control.

(I) TB control programs should have access to adequate. Outpatient and inpatient facilities offering TB treatment should have ready access to mycobacteriology laboratory services (acid-fast examinations of specimens, ideally, within 24 h of specimen collection), a sufficient quantity of radiology equipment and enough trained radiology technicians so that chest radiographs can be obtained each day during clinic hours for all patients needing them. Furthermore, the chest radiograph should be interpreted by a qualified person, and the report of the chest radiograph findings should be available within 24 h [11].

(III) In the present study, communication with central health authorities (Tables 6 and 7 and Fig. 2) in urban areas was higher than rural areas (65.4% versus 57.1%), this is due to the fact that central health authorities are located in the urban areas.

In the present study, communication with central health authorities or a TB specialist was present in 62.5% and absent in 37.5%. These findings depict a shortage in TB control program in the governorate PHC units. According to WHO, (2010) guidelines [10], expert medical consultation in TB treatment should be available to the health care community, especially for patients who have drug resistant disease or medical problems that might affect the course or the outcome of treatment. Consultants may be employees of the health department or clinicians with expertise who are in contact with the health department. Community health centers typically provide primary health-care services to populations that encounter barriers to receiving those services at other sites in the health-care system. Community health centers are a critical part of efforts to control and prevent TB.

PHC physicians must communicate both with the patient and health authorities. Communication with patient to emphasize that TB is a curable condition and to stress the importance of regular follow up during treatment and with specialized health authorities to be aware of patients who were referred for diagnosis and treatment [14]. Absence of communication with central health authorities in large numbers of PHC units in Qalyubia Governorate constitutes a big defect in TB control.

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### Table 9

Comparison among the studied territories regarding participation in community education.

<table>
<thead>
<tr>
<th>Follow-up territory</th>
<th>No</th>
<th>Yes</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N = 9 % (Total = 22.5)</td>
<td>N = 31 % (Total = 77.5)</td>
</tr>
<tr>
<td>Benha</td>
<td>3 60 2 40</td>
<td></td>
</tr>
<tr>
<td>Kafir Shokr</td>
<td>1 25 4 75</td>
<td></td>
</tr>
<tr>
<td>Tokh</td>
<td>0 0 5 100</td>
<td></td>
</tr>
<tr>
<td>Shebina</td>
<td>0 0 5 100</td>
<td></td>
</tr>
<tr>
<td>Elkanater</td>
<td>5 100 0 0</td>
<td></td>
</tr>
<tr>
<td>Qalyoub</td>
<td>2 40 3 60</td>
<td></td>
</tr>
<tr>
<td>Elkanater</td>
<td>1 20 4 80</td>
<td></td>
</tr>
<tr>
<td>Shubra</td>
<td>0 0 5 100</td>
<td></td>
</tr>
<tr>
<td>Elkhanka</td>
<td>2 40 3 60</td>
<td></td>
</tr>
</tbody>
</table>

\[
X^2 = 10.2 \quad P = 0.17
\]

---

### Table 10

Comparison among the studied territories regarding patient follow up after referral to central health units.

<table>
<thead>
<tr>
<th>Follow-up territory</th>
<th>No</th>
<th>Yes</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N = 36 % (Total = 90%)</td>
<td>N = 4 % (Total = 10%)</td>
</tr>
<tr>
<td>Benha</td>
<td>3 60 2 40</td>
<td></td>
</tr>
<tr>
<td>Kafir Shokr</td>
<td>5 100 0 0</td>
<td></td>
</tr>
<tr>
<td>Shokr</td>
<td>5 100 0 0</td>
<td></td>
</tr>
<tr>
<td>Tokh</td>
<td>4 80 1 20</td>
<td></td>
</tr>
<tr>
<td>Shebina</td>
<td>5 100 0 0</td>
<td></td>
</tr>
<tr>
<td>Elkanater</td>
<td>4 80 1 20</td>
<td></td>
</tr>
<tr>
<td>Qalyoub</td>
<td>5 100 0 0</td>
<td></td>
</tr>
<tr>
<td>Elkanater</td>
<td>5 100 0 0</td>
<td></td>
</tr>
<tr>
<td>Shubra</td>
<td>5 100 0 0</td>
<td></td>
</tr>
<tr>
<td>Elkhanka</td>
<td>5 100 0 0</td>
<td></td>
</tr>
</tbody>
</table>

\[
X^2 = 8.89 \quad P = 0.26
\]
in the governorate and reflects the absence of follow up of central health authorities and needs strict and rapid interventions.

(IV) In this work, case recording (Tables 6 and 8 and Fig. 2) was lower in urban than rural areas (42.9% versus 46.2%). The availability of a proper recording system was found in only 18 units (45%) with marked variation between units in the same territory. This may be explained by the fact that the recording system is mainly done by nurses who are not followed up by the territory authority and another factor could be the absence of financial incentive to nurses for their extra duty.

Case recording is an essential part of TB control program both internationally and locally. Case recording with essential data about resistance and methods of communication with patients as well as type of the disease, pulmonary or extra-pulmonary, sensitive or resistant and if the later mono or multi drug resistant. Data of the patients help close follow up and avoid losing them for a long time so that proper intervention is to be taken [3]. Again lack of recording systems for diagnosed TB cases constitutes a big fault in TB control in Qalyubia Governorate as well as lack of follow up from central health authorities.

TB control programs should maintain a computerized record system (case registry) with up-to-date information on all current clinically active and suspected TB cases in the community. To ensure follow-up of all TB patients and those persons suspected of having TB, registry information (e.g., smear, culture, and susceptibility results; clinical status; chest radiograph results; and doses of medications being administered) should be obtained and updated on a continuing basis [11].

(V) In this work patient follow up after referral to central health units (Tables 6 and 9 and Fig. 2) was found in 4 units (10%). This is almost due to lack of awareness about the importance of follow up of the cases and constitutes a big gap in which good TB control sinks and fails because one of the important roles of PHC in NTP according to WHO treatment guidelines [1] is patient follow up. Lack of patient follow up is one of the important factors that lead to default treatment in TB because patients misunderstand stopping follow up as an indication of cure or failure to cure, both of which force patients to stop their treatment. Follow up of patients give them a direct clue of the importance of their treatment and includes continuous encouragement to complete and to change medication as required when side effects develop while in contact with central health authorities. This follow up is stressed in all TB control programs given by WHO or national authorities [12].

Physicians in PHC units complain as they did not get any training from health authorities in the territories about TB which makes them unable to deal with TB patients. They also were frequently replaced and not kept in their units for sufficient periods of time so they do not care about follow up of patients.

(VI) In this study, (Tables 6 and 10 and Fig. 2) the participation of both rural and urban units in community education about TB was nearly equal (76.9% versus 78.6%). The participation in community education about TB was practiced in 31 units (77.5%).

TB, like other infectious diseases, can be controlled when awareness about transmission in the community is high. Increased awareness about TB and contribution of the community in TB control are essential [15].

Contacts of the patient are the very susceptible to infection [16] so, education of patient family for proper home ventilation, avoidance of direct exposure to patients’ air droplets on coughing and disinfection methods is essential [17].

Vásquez-Campos et al. [18] recorded that the NTP designed its communication component to help achieve its overall goal of detecting 70 percent of infectious TB cases and treating 85 percent of them. These program objectives also became the goals of the communication strategy. The NTP used communication to address several issues that challenged the program which are essentially the job of PHC services. These issues included:

- Communication goals
- Communication activities
- Impact
- Reducing stigma about the disease, especially among health care workers, and introducing an enabling environment for case detection and cure
- Gaining support from political, governmental, international, and local leaders for the program
- Raising awareness about TB in general, including the effectiveness of treatment and that diagnosis and treatment were available at no cost
- Improving knowledge about TB case detection
- Encouraging those with symptoms to seek help
- Strengthening the link between health facilities and the community to improve case detection and treatment success
- Improving both passive and active case identification by building health care workers’ capacity to approach and counsel patients and by increasing community involvement in detecting new cases
- Improving compliance with treatment by motivating patients and supporting volunteers, family members, and the community
- Reaching high-risk groups, particularly the urban poor areas
- Reaching “closed population” groups with high TB prevalence, such as those living in prisons, mental institutions, retirement homes, and homeless shelters.

Conclusions

In Qalyubia Governorate, PHC physicians lack proper knowledge about TB and their units lack proper equipments (Lab and CXR). There was a low communication between PHC providers and the central health authorities, with lack of proper recording and follow up of cases. The PHC system needs to be empowered by the health care authorities through training and equipments for better performance in NTP. More wide research is needed to cover PHC system performance in NTP all over Egypt.

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Conflict of interest

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References


