

A validated Clinical Practice Guideline for Community Health Nurse Working in Tuberculosis Out-patient Clinics

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Abstract: Tuberculosis is a major contributor to disease burden in developing countries; it is considered the second fatal disease all over the world and the third most important public health problem in Egypt. The direct causes of increasing the burden of tuberculosis are the inconsistent and fragmented health services. The nursing interventions of tuberculosis in community settings require system of recommendation that ensures the consistency of care. The present study aimed at providing a valid clinical guideline that assist nurses to intervene consistently to the newly diagnosed pulmonary tuberculosis patient. The needs analysis of community health nurses working in out patient chest clinics in addition to the expectation of newly diagnosed pulmonary tuberculosis patient regarding nursing interventions. The guideline development process established according to the criteria of experts of guideline development organizations. The Scottish Intercollegiate Guidelines Network (Sign) research appraisal tools were used for the critical appraisal phase of the obtained evidence. AGREE instrument was used for assessing the internal validity of the guideline. The guideline and appraised for internal validity by academic nursing and medical staff, nursing, and medical practitioners. The scores of all appraisers in relation to scope and Purpose, stakeholder involvement, rigour of development ranged from (62.9-77.7%, 53.5-77.7%, and 66.6-76.2%), respectively. While the scores for the clarity and presentation were 50- 76.4, applicability were 61.9-68.5, and editorial independence were 88- 93. The four groups of revision strongly recommended the application of the guideline.

Key words: Pulmonary Tuberculosis; Nursing Intervention; Clinical Guideline; Chest Out-Patient Clinics

INTRODUCTION

Tuberculosis (TB) is among the top 10 causes of death in the world. TB is an important public health problem in the Eastern Mediterranean Region of the World Health Organization. Every year the disease kills 136 000 people and, affects 630 000 in that region⁽¹⁾ Tuberculosis is a major contributor to the disease burden in developing countries (2). It is considered the third most important public health problem in Egypt⁽³⁾.The global plan to stop

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tuberculosis recommended the patient or to practitioner errors, sustainability and accessibility of the irregularity and loss to follow-up⁽⁸⁾ standardized short-course chemotherapy resulted from the fragmentation and for all cases of tuberculosis⁽⁴⁾. The inconsistency of the provided services. directly observed treatment strategy Also poor quality of care results from (DOTS) is required to ensure treatment routines and inadequate provider-patient adherence and it helps to reinforce relations, all contribute to poor patients' motivation to continue treatment⁽⁵⁾. treatment⁽⁹⁾.

The main reasons for the increase of the global burden of TB are the following: inadequate health services, improper management practices resulting in poor case detection, diagnosis and treatment, demographic changes: increasing world population, changing age structure, and impact of the HIV as a pandemic disease⁽⁶⁾

Treatment failure is a serious problem for tuberculosis control program in many countries. In Egypt, it accounts for 3%- 5% of treatment outcome of new smear positive cases⁽⁷⁾. Treatment failure may occur due to poor compliance of the

Nurses play a crucial role in tuberculosis control program. The International Council of Nursing (ICN) believes that nurses are in a position to advocate for strong tuberculosis control programs and to implement the elements of DOTS⁽¹⁰⁾. Nurses are a vital component in the control, treatment, and cure of tuberculosis. Most treatment nowadays is carried out in the community settings. Treatment is best supervised by nurses in regular contact with the patient. The nurse who can best assure that each patient successfully complete treatment, the main principle of nursing intervention

is the integrated organization of multiple activities to achieve specific outcomes for patients⁽¹¹⁾ The nursing intervention requires a system of recommendation that improving performance and support the quality of health services. This system of recommendation can be obtained through developing clinical guidelines that are defined as "systematically developed statements to assist practitioner and patient decision about appropriate health care for specific clinical circumstances."⁽¹²⁾

Clinical practice guidelines are important tools used by interdisciplinary health care providers to specify and standardize the processes of care for specific patient populations with defined health related conditions. They result from a synthesis of available scientific knowledge as well as expert consensus. By describing recommended courses of

action, guidelines are intended to assist practitioner and patient decision making regarding the most appropriate care process for a specific clinical condition. When used as an integral component of the quality improvement process, guidelines are helpful in the identification and analysis of practice variation and the measurable patient outcomes. The periodic review, revision, and distribution of guidelines help to keep the practitioner's knowledge base up to date by dissemination of new advances in everyday practice^(13, 14) .

Regarding tuberculosis clinical guideline it calls the attention to the under recognized health problems of tuberculosis patients as well as discourages the ineffective interventions to reduce the morbidity and mortality rates⁽¹⁵⁾. The present study has been accomplished to validate a clinical guideline that aim at improving nursing

intervention and health outcome of newly diagnosed pulmonary tuberculosis patients.

MATERIAL AND METHODS

This work was accomplished during the period from February 2006 up to April 2008, through out two phases: the first phase included needs assessment of tuberculosis patients and nurses working at chest out patient clinics. The second phase included the developing of the intended clinical guideline for nurses working at chest out patient clinics, which is based on the results of the first phase.

Operational definitions

Newly diagnosed patient: A patient who has never had treatment for TB or who has taken anti-tuberculosis drugs for less than four weeks⁽¹⁶⁾.

Internal validity of clinical guideline: Appropriateness of the guideline to be published and ready for application⁽¹⁷⁾.

Phase I: Needs assessment

This work is a cross sectional study carried out in Dakahlea Governorate during the period from February 2006 up to June 2006 to:

- Assess nurses' knowledge about pulmonary tuberculosis and identify their role with newly diagnosed pulmonary tuberculosis patients.
- Identify the expectations of newly pulmonary tuberculosis patients regarding the role of nurse in tuberculosis managements in out patient clinics.

The study was accomplished in two separate stages:

- 1- Preparatory stage
- 2- Operational stage

1-Preparatory stage

- Communication and official approval were obtained from the directorates of chest out patient clinics in Mansoura and Manzala districts.

- Literatures were reviewed to develop the study tools.
- A questionnaire form and two interview sheets were constructed and used in the collection of the required data:

Nurses' Knowledge questionnaire was used to assess nurses' knowledge regarding to nature of tuberculosis, manifestations, and the role of nurses in managing newly diagnosed pulmonary tuberculosis patients. The total score of the knowledge was 47, which cover four items namely: the nature of the tuberculosis, 13 scores (definition of tuberculosis, causative agent, types of tuberculosis, modes of transmission, and manifestations), the treatment strategy 16 scores, (types of treatment, duration, side effect, and Directly Observed Treatment Strategy), and nursing role 18 scores. Open ended questions were used to avoid guessing.

Nurses' performance interview sheet

included open ended questions about the actual nursing intervention for newly diagnosed of pulmonary tuberculosis patients.

Patients' expectations interview sheet

was used to identify expectations of newly diagnosed pulmonary tuberculosis patients regarding the role of nurse in management of the disease.

2-Operational stage:

Sampling

Nurses: A convenient sample of 28 nurses were selected from 6 chest out patient clinics namely; El-Mansoura chest clinic (15 nurses), El-Manzala chest clinic (4 nurses), Belkas (2 nurses), Aga (3 nurses), Dekernes (2 nurses), and Sherbin (2 nurses).

Lack of knowledge was found among target nurses about tuberculosis in relation to etiology, modes of transmission, and their role in managing

new cases of pulmonary tuberculosis patients. Nurses perform in a divergent manner, according to their personal competence and capabilities regarding nursing intervention throughout DOT strategy. Furthermore, there was no nursing contribution in the plan of tuberculosis management and there were no any nursing guidelines or protocol available in the clinical settings.

It was found that there was a lack of knowledge among studied nurses about tuberculosis regarding its etiology, modes of transmission, and their role in managing new cases of pulmonary tuberculosis patients, Table (1). They recommended that they need a guide to follow it in their work.

Short interactive interview was conducted with nurses to identify their actual performance as regards management of tuberculosis patient, the interviews revealed that most items of

nursing role are not performed by nurses except (100%) obtaining demographic information, (63%) interview and contact investigations, and (52%) of them follow-up by bacteriology test (21%) Providing education about TB to health care providers and notification system if patient missed appointments of medication while (15%) of nurses monitor the TB medication regimen.

Patients: A convenient sample of 36 patients all admitted newly diagnosed patients was included from the six chest out patient clinics during the period from 1st March to the end of June 2006. Each out patient clinic was visited twice/month with a total 8 visits for each clinic.

The expectations of newly diagnosed tuberculosis patients about nursing intervention were obtained from patients through short interactive interview. Patients recommended that the role of nurses must be unique and clear.

Patients mentioned that they require for proper communications, accurate time of medication, continuous follow-up, and nurse should be a link between patient and physician (Table 3).

Phase II: Developing guideline

The guideline was developed according to the criteria of the American Academy of Neurology 2004, Scottish Intercollegiate Guidelines Network 2008.

1. A peer group of work included three members as follows: 3 community health nursing specialist, 2 of them have additional experiences in epidemiology, environmental health, and evidence-based practice. The peer group is appropriate for the local use guideline⁽¹⁸⁾.
2. The pulmonary tuberculosis was chosen as an emerging disease in

Egypt. Clinical questions were constructed:

How to assess pulmonary tuberculosis patient?

What are the risk factors resulting in defaulting in pulmonary tuberculosis patient?

How do nurses diagnose health needs and problems in pulmonary tuberculosis patients?

What are the principles of pulmonary tuberculosis treatment?

What are the best measures to prevent pulmonary tuberculosis?

What are the best measures to control pulmonary tuberculosis?

What is the role of nurse in managing the new cases of pulmonary tuberculosis?

What are the components of educational program for tuberculosis patients and contacts?

Does follow-up of pulmonary tuberculosis patient increase the adherence of treatment?

What are the nutritional requirements of pulmonary tuberculosis patients?

What is the nursing role in implementing the DOTS strategy?

How to increase the patients' adherence to pulmonary tuberculosis treatment?

What are the types of nursing records that are used in tuberculosis clinics?

What are the infection control measures to be followed to prevent spread of tuberculosis infection?

What is the ethical aspect of pulmonary tuberculosis management?

3- A literature search was undertaken to identify potentially relevant evidence and establishing evidence-based guidelines. The guidelines development group reviewed a set of researches and evidence-based guidelines for tuberculosis management. Review of the literature was conducted from the electronic data bases (MEDLINE, Cochrane Database of Systematic Reviews, National Guideline Clearing house at www.guideline.gov, Scottish Intercollegiate Guidelines Network at www.sign.ac.uk, National Institute for Health and Clinical Excellence (NICE) at www.nice.org.uk, WHO., CDC, EMBSA, National Electronic Library for Health at www.libraryies.nelh.nhs.uk/guidelinesfinder/, Center for Review and Dissemination (CRD) at www.york.ac.uk/ins/crd/, and Egyptian National Evidence-Based Center-Alexandria University) and through hand searching of several relevant nursing and medical Journals. The review of literatures was conducted from 1990 up to 2008 and only English language was utilized during search.

The used search terms used for answering the clinical questions are: "nursing role in tuberculosis management", "DOTS strategy", "adherence and compliance to tuberculosis treatment", and "diagnoses of tuberculosis"

The numbers of source documents are 324 studies including systematic reviews of randomized trails, Cohort studies, Cross sectional, case-control studies, Expert opinion, and guidelines management for newly diagnosed tuberculosis patient. Studies of multi-drug resistance and treatment failure were excluded.

4- Evaluation of Evidence and grading recommendations. The obtained studies appraised by two members of the development group. The researchers utilized the Scottish Intercollegiate Guideline Network (SIGN) System⁽¹⁷⁾ (www.sign.ac.uk). Evaluation of evidence

and grading guideline recommendations was conducted on the following steps

Evaluation of evidence and grading recommendations:

The researchers utilized the Scottish Intercollegiate Guidelines Network (SIGN) system which gives clear guidance on how to evaluate the design of individual study. For areas where available evidence is inconsistent or inconclusive, recommendations were made based on the clinical experience and judgment of the experts. Evaluation of evidence and grading guidelines recommendations was conducted on the following steps:

1-Study Validity Rating

All primary studies and reviews addressing the relevant topic were appraised using SIGN checklist that appropriate to the study design, and then were individually rated for internal validity using the following system⁽¹⁷⁾.

Rating	Description		
1+			Well conducted meta-analysis
++	All or most of the criteria have been fulfilled		systematic reviews or randomized control trails with a low risk of bias.
+	Some of the criteria have been fulfilled		
-	Few or no criteria fulfilled	1-	Meta-analysis, systematic reviews, or randomized control trails with a high risk of bias.
2-Determination Level of Evidence:			
<i>The study design is assigned by numerical prefix using the system below:</i>		2++	High quality systemic reviewers of case-control or cohort studies with a very low risk of bias and a high probability that the relationship is causal.
1-	For systematic review or meta-analysis or Randomized Control Trials (RCTs)		
2-	For Cohort and Case-Control studies		
3-	For Case Report series		
4-	For expert opinion/logical argument/common sense	2+	Well conducted case-control or cohort studies with a low risk of bias and a moderate probability that the relationship is causal.
3-Then each study is assigned to a level of evidence by using the system below			
Level	Type of Evidence		
1++	High quality meta-analysis systematic reviews of randomized control trails with a very low risk of bias	2-	Case-control or cohort studies with a high risk of bias and a significant risk that the relationship is not causal.
		3	Non-analytic studies, e.g., case

reports, case series

4 Expert opinion

3-Grade of Recommendation

The detailed results of each study were considered in the formulation of each guideline recommendation which was then graded using the following system

Grade Recommendation

A At least one meta-analysis, systematic review, or RCT rated as 1++. And directly applicable to the target population, or a body of evidence consisting principally of studies rated as 1+, directly applicable to the target population and demonstrating overall consistency of results

B A body of evidence including studies rated as 2++, directly applicable to the target population and demonstrating overall consistency of result, or extrapolated evidence from studies rated as 1++ or 1+.

C A body of evidence including studies rated as 2+, directly applicable to the target population and demonstrating overall consistency of result, or extrapolated evidence from studies rated as 2++

D Evidence level 3 or 4, or extrapolated evidence from studies rated as 2+

Some guidelines recommendations do not have evidence grade because

available evidence was weak or absent. So the recommendations in this situation were made based on the clinical experience and judgment of the experts.

4. Formulation of Guidelines Drafts

A draft of tuberculosis guideline including pathway of tuberculosis patient in chest clinics algorithm was drawn up. The overall belief was that guidelines development and refinement is an evolutionary process. The guidelines development group met 16 times over a seven month period and the guidelines were redrafted three times before the final agreed format was ready for appraisal on the study clinics.

5- Guidelines Revision and Evaluation of internal validation

Drafts of the developed guidelines were circulated to the experts for revision before its publication. Academic and clinical experts to measure the content validity, reliability, and its applicability of the final guidelines recommendations and format by utilizing "Agree Instrument"⁽¹⁹⁾. The number of appraisers according to the Agree instrument should not be less than two and preferably exceed up to four appraisers to ensure the appraisal reliability⁽¹⁹⁾. The Guideline was appraised by six academic nursing and medical staff members as well as 6 practitioner nurses and 7 practitioner physicians who are working in out-patient chest clinics.

Calculating domain scores

Maximum possible score = 4 (strongly agree) x 3 (items) x 4 (appraisers) = 48

Minimum possible score = 1 (strongly disagree) x 3 (items) x 4 (appraisers) = 12

Minimum and maximum scores for dominos and appraisers

Domains	Scores	Academic nursing staff	Academic medical staff	Practitioner nurses	Practitioner physicians
Scope and Purpose	Maximum	36	36	72	84
	Minimum	9	9	18	21
Stakeholder involvement	Maximum	48	48	96	112
	Minimum	12	12	24	28
Rigour of development	Maximum	84	84	186	196
	Minimum	21	21	42	49
Clarity and presentation	Maximum	48	48	96	112
	Minimum	12	12	24	28
Applicability	Maximum	36	36	72	84
	Minimum	9	9	18	21
Editorial independence	Maximum	24	24	48	56
	Minimum	6	6	12	14

The standardized domain score will be:

$$\left[\frac{\text{Obtained score} - \text{minimum possible score}}{\text{Maximum possible score} - \text{minimum possible score}} \right] \times 100.$$

Statistical analysis:

Revision group involved 17 appraisers to increase the reliability of assessment.

This group involved three academic nursing staff, three academic medical staff, six practitioner nurses, and seven practitioner physicians. Any specific instructions and comments from expert's revision were documented and considered in the formulation of the final booklet and feedback from their revision was used to modify it.

Simple frequency tables were used to illustrate the obtained data.

RESULTS

Assessment:

On the basis of expert opinions' evidence (graded level 4)⁽³⁾ and six researches (graded level 2++)⁽²⁰⁻²⁶⁾, it was concluded that social and environmental factors are considered as risk factors of tuberculosis infection, in addition to lifestyle namely. smoking,

hygiene and nutritional habits. Furthermore, this evidences and other two level 4 guidelines⁽²⁷⁻²⁸⁾ emphasized on the importance of assessing this risk factors.

Recommendation: Obtain essential information about patient's socio-demographic data, surrounding environment and lifestyle

On the basis of one cohort study (graded level 2++)⁽²⁷⁾ and seven guidelines (graded level 4)^(5, 10, 27-28, 30-32), the importance of providing a base line data about the manifestation, vital signs, anthropometric measurements, and co-morbid conditions are recommended.

Recommendation: Assess the present and past health history

On the basis of four case control studies (graded level 2++)^(23, 31-33) and one standard of care⁽²⁸⁾, in addition to one guideline (graded level 4)⁽³²⁾, it is emphasized that knowledge and believes

of the patient regarding tuberculosis affect his compliance to treatment.

Recommendation: Obtain information about patient's knowledge and perception about tuberculosis

On the basis of one cohort study (graded level) 2++⁽³⁶⁾ and two guidelines (graded level 4)^(27, 30), it is indicted that the nurse should monitor and follow the conduction of diagnostic measures, namely: chest X- ray, tuberculin skin test, and three sputum specimens.

Recommendation: Ensure that patient complete the required diagnostic measures

On the basis of one expert opinion⁽³⁾ and four guidelines (graded level 4)^(27,28, 32, 37), the contacts should be assessed for tuberculosis infection within maximum of 15 days.

Recommendation: Assess the patient's contacts health condition

Nursing diagnosis:

On the basis of two guidelines (graded level 4)^(10, 31), the recognition of health needs and problems of patients is important base for nursing interventions. Furthermore, clear understanding of patients' situation is a key for objective intervention.

Recommendation: Identify the patient's health needs and problems

On the basis of three guidelines (graded level 4)^(31- 32, 37), it is recommended that contact assessment is evidence of active case finding.

Recommendation: Identify the contacts' health needs and problems

Nursing care plan:

On the basis of three guidelines (graded level 4)^(10,28,31) which indicated that defining treatment goals and expected outcomes at the beginning of treatment reduces confusion and misunderstanding. The plan must be

realistic and achievable during all stages of treatment.

Recommendation: Plan to coordinate the ongoing care and services of clinical visits for specimen collection

Recommendation: Plan for identification of treatment obstacles

Recommendation: Plan for patient's motivation to increase adherence to anti-TB medication

Recommendation: Plan for patient's health education

Recommendation: Plan for health education of contacts

Recommendation: Plan to coordinate the ongoing care and services of referral and follow-up

Recommendation: Plan for monitoring and evaluation of patient's progress

Implementation:**Treatment**

Based on two systematic reviews (graded level 2++)⁽³⁸⁻³⁹⁾, WHO

guideline,⁽⁴⁾ and the National Tuberculosis Program (graded level 4)⁽²⁹⁾, it is indicated that promoting compliance should be through facilitating treatment access, choosing the most convenient time, place for direct observation treatment, and providing other social and medical services.

Recommendation: Implement of the schedule of the prescribed treatment

Recommendation: Conduct daily visit at the first two months for observed treatment

Recommendation: Conduct weekly visit during the complementary four months to receive a day observed dose and take the dose for the rest of the week

Recommendation: The nurse should provide motivation and incentives to increase the treatment compliance

Health education

According to one cohort study (graded level 2++) and three guidelines

(graded level 4)^(5,10,32), it is revealed that health education is an important part of effective control program that has a good cure rate. The health education should include patient, contacts and care providers. It must address all aspects of disease, treatment regimen, side effect of medication, healthy behavior, and social relationship. Health education targeted to correction of patient's perception.

Recommendation: Implement health educational program for patient

Recommendation: Implement health educational program for care provider

Recommendation: Implement health educational program for contacts

Follow-up and referral:

On the basis of two cross sectional studies⁽²⁰⁻²³⁾, two cohort studies^(23, 36) (graded level 2++), and to six guidelines (graded level 4) (10, 27, 29, 30, 32, 40), they recommended that patient should be followed up monthly for treatment

adherence, medication side effect, and condition progress through sputum test. Other cohort study (graded level 2++)⁽²⁴⁾ revealed that uncontrolled blood sugar interfere with the effect of anti-tuberculosis medication.

Recommendation: Monitor the patient

health condition monthly

Recommendation: Check blood sugar

level for patient with co-morbid

diabetes mellitus

On the basis of one guideline (graded level 4)^(31, 39, 41), if the patient disappointed one visit, the health care worker should conduct a home visit to him for ensuring treatment continuity.

Recommendation: Report the social

workers about the patient who dropped

out an appointment of treatment or

follow-up

Recommendation: Ensure that social

workers conduct a home visit for the

dropped out patient or conduct it by

herself (according to policy)

Documentation and reporting:

On the basis of two guidelines (graded level 4)^(28,31) they concluded that all patient information regarding progress, intervention, visits schedule, and obstacles should be recorded accurately and clearly in special formats and reported to the assigned health care providers. In addition to one systematic review (graded level 4)⁽⁴²⁾, it emphasized the confidentiality of patient's information.

Recommendation: Ensure that all

patients' data are complete

Recommendation: Recording data of each visit and all procedures performed

to the patient by using the appropriate

format

Recommendation: Information of patients

and contacts should be considered as

confidential information

Appraisal of guideline:

Regarding to the AGREE instrument appraisal, results revealed that the scores of all appraisers in relation to scope and Purpose, stakeholder involvement, and rigour of development ranged from (62.9- 77.7%, 53.5- 77.7%, and 66.6- 76.2%), respectively. While the scores for the clarity and presentation were 50- 76.4, applicability were 61.9- 68.5, and editorial independence were 88- 93.

As regard to the overall assessment of the guideline, two-thirds of academic nursing and medical staff strongly recommended the guideline for use in practice and the majority of practitioner nurses as well as three quadrants of practitioner physicians recommended the guideline for use in practice.

DISCUSSION

There are many guidelines and standard ^(5,10,20,27,28,32,37) which provided

strong foundation for the present work, but not all of them explicit outline how evidence was identified, interpreted, or integrated in to recommendations. The tuberculosis treatment guideline in 2003 published by Centers for Disease Control and Prevention (CDC) developed its recommendations according to the "Infectious Diseases Society of America/Public Health Service Rating System". This guideline was compared with guidelines for other groups and it was reviewed by external and internal peer reviewers. CDC guideline 2003 strongly recommended that patient-centered care can be the initial management strategy. This strategy should always include an adherence plan that emphasizes directly observed therapy (DOT)⁽⁴⁾. Each patient's management plan should be individualized to incorporate measures that facilitate adherence to the drug

regimen. Such measures may include social services support, and coordination of tuberculosis services with those of other providers, this completely is in agreement with this guideline recommendation.

The investigation of contacts of persons with infectious tuberculosis guideline published in 2005 by CDC, also provided supportive foundation to the existing recommendations. However, this document did not provide sufficient methodology description of how the guideline was developed, especially for the searches of electronic database and rating scheme for the strength of evidence, while the working group was well defined. Although the guideline of CDC 2005 mentioned that nurses are one of their intended users, it did not directly mentioned what they should do, while the present guideline identified the role of nurse clearly and directly⁽³⁵⁾.

Other guidelines, namely: WHO 2003, ICN 2004, Federal Bureau of Prisons 2004, NTP 2005, and Tuberculosis Coalition for Technical Assistance 2006, strongly support the recommendations of the present guideline, but none of the stated clear directly applicable statements for nursing interventions^(5, 10, 20, 27, 28, 31).

The present guideline demonstrates several strength points; firstly, it elicits patient perspectives during the guideline development process, secondly, the guideline was evaluated by the intended users (nurses) and their work partners (physicians) who are working in chest outpatient clinics. Most of them mentioned that the guideline is effective, recommendation stated clearly, and could be easily implemented by nurses and they are in need for such guideline. Finally the guideline attached with supportive tools which will facilitate the

nursing interventions. In addition, the guideline formulated within the scope of the WHO guideline for National program, which will increase its applicability process in the future.⁽³⁷⁾

The present guideline based on different types of studies, namely: cohort studies, systematic review, case-control, cross sectional studies, and guidelines. The development of this guideline followed certain process and criteria of guideline development.^(14,43-46) All of these references almost have the same criteria and process for a successful guideline development which includes proper selection of guideline topic, forms multidisciplinary group of work, developing clinical questions, comprehensively review of literature, rating of articles, and summarizing finding. Moreover, the successful guideline should include writing supported practice recommendations,

reviewing and critically appraising the guideline by a group of expert reviewers and intended users by using a standardized tool. Finally, the guideline should be distributed to practitioners of its field specialty. Also this guideline met the appraisal criteria of the AGREE instrument that includes a clear presentation of guideline's scope and purpose, stakeholder involvement, rigour of development, clarity and presentation, applicability, and editorial independence⁽¹⁹⁾.

In further phase, the feedback should be obtained from members and practitioners regarding the guideline's effectiveness, and then the degree of guideline adherence and its clinical impact should be evaluated. This further phase is strongly recommended for the present guideline to be implemented in the future.

CONCLUSION

AND and stockholders to be used in the out-

RECOMMENDATIONS

patients chest clinics. It is recommended

In conclusion, the developed that the guideline should disseminate to guideline was based on the needs of the the authoritative level to be applied in the intended users of nurses and end points chest out patient clinics and evaluated for beneficiaries, i.e., patients. It was applicability and achieved outcomes. strongly recommended by the reviewers

Table 1: Knowledge's scores of nurses regarding tuberculosis and nursing role.

Items	Total scores	Nurses' scores	Level of knowledge
Nature of the disease	6.00	4.2± 1.3	Good > 65%
Manifestations	7.00	3.7± 0.9	Fair (50- < 65%)
Treatment regimen	4.00	2.5± 1.1	Fair (50- < 65%)
Treatment side effect	12.00	2.6± 0.8	Poor (< 50%)
Nursing role in managing of tuberculosis patient	18.00	1.02± 0.8	Poor (< 50%)

Table 2: Identification of tasks performed by nurses in Tuberculosis management

Task	Number 28	%
Obtain demographic information	28.00	100.00
Obtain vital signs and baseline weight	00.00	00.00
Obtain past and present health history	00.00	00.00
Identify the patients' knowledge and perception about T.B	00.00	00.00
Identify barriers to adherence in taking T.B medication	00.00	00.00
Interview and contact investigations	17.00	60.70
Monitor the T.B medication regimen	04.00	14.30
Observe for side effects or medication reactions	00.00	00.00
Providing education about T.B to health care providers	06.00	21.00
Bacteriology test for follow up	10.00	35.70
Notification system if pt missed appointments of medication.	06.00	21.00
Assess patient satisfied with the services or care	00.00	00.00
Monitor the patient medical records	00.00	00.00
Assure patient confidentiality	00.00	00.00

Table 3: Patients' expectation about nursing intervention

Items	Number 36	%
Proper communication	8.00	22
Accurate timing of medication	18.00	50
Continuous follow-up	12.00	33.3
Nurse as link between patient and physician	16.00	44.4

Table 4: Appraisal scores (%) of the guideline

Agree instrument items %	Appraisers			
	Academic nurses 3	Academic Physicians 3	Clinician nurses 6	Clinician physicians 7
Scope and Purpose	77.7	62.9	72.2	73
Stakeholder involvement	66.6	77.7	69.4	53.5
Rigour of development	76.2	70.1	73	66.6
Clarity and presentation	50	66.6	76.4	66.6
Applicability	67.3	65.3	68.5	61.9
Editorial independence	90	88	93	91

Table 5: Distribution of appraisers according to their overall assessment of the guideline

Appraisers	Items			
	Strongly recommended for use in practice		Recommended for use in practice	
	Frequency	%	Frequency	%
Academic nursing staff Number=3	2	66.6	1	33.3
Academic medical staff Number=3	2	66.6	1	33.3
Practitioner nurses Number=6	5	83.3	1	16.6
Practitioner physicians Number=7	5	71.4	2	28.5
Total number of appraisers= 19	14	73.6	5	26.3

REFERENCES

1. World Health Organization. Global tuberculosis control report 2008: World health statistics fact sheet 2007
2. World Health Organization. Global tuberculosis control: surveillance, planning, financing. Geneva: WHO; Document WHO/ CDS/ TB/2003; 316.
3. Philip C, Madhukar P. Tuberculosis, vulnerability, and access to quality care. *JAMA*. 2005; 293 (22): 2790- 3.
4. World Health Organization. An expanded DOTS framework for effective tuberculosis control. Geneva: WHO; 2002.
5. World Health Organization, Treatment of tuberculosis: Guidelines for National Programmes. Third edition. Geneva,WHUI; 2003.
6. Pratt RJ, Grange JM, Williams VG. Tuberculosis, A foundation for nursing and health care practice. London: Hodder Arnold; 2005
7. Al-Moamary, Black W, Bessuille E, Elwood K, Vedal S. The significance of the persistent presence of acid-fast bacilli in sputum smears in pulmonary tuberculosis. *Chest*. 1999; 116 (3): 726-31.
8. Kim SY. Drug-resistant pulmonary tuberculosis in a tertiary referral hospital in Korea. *Korean Journal of Internal Medicine*.1999; 14 (1): 27- 31.
9. Zwarenstein M, Schoeman JH, Vundule C, Lombard CJ, Tatley M. Randomised controlled trial supervised and directly observed treatment of

- tuberculosis. *Lancet*. 1998; 352: 1340-3.
10. International Council of Nurses. Tuberculosis Guideline for Nurse in the care and control of tuberculosis and Multi-drug resistant tuberculosis. ICN, 2004, Geneva.
 11. Robert JP, John MG, Williams GV. Tuberculosis: A foundation for nursing and healthcare practice. 1st edition. UK: Oxford University Press Inc; 2005.
 12. Lohr KN, eds. Clinical practice guidelines: directions for new program. Washington DC: National Academy Press. 1990.
 13. Brackman RZ, Harris JS. Occupational medicine practice guideline. *Occup Med*. 1998; 13: 679- 91.
 14. Richman R, Lancaster RD. The clinical guideline process within a managed care organization, 2000.
 15. Woolf HS, Grol R, Hutchinson A, Eccles M, Grimshaw J. Clinical guideline: Potential benefits, limitations and harms of clinical guidelines. *BMJ*. 1999; 318: 527- 30.
 16. Tuberculosis Manual of Prevention and Control. First Edition, Port -of-Spain, Trinidad: The Caribbean Epidemiology Centre (CAREC) PO Box 164; 1997.
 17. Scottish Intercollegiate Guideline Network (SIGN) System. www.sign.ac.uk. 2008
 18. Wil JM, Sanden D, Mettes GD, Plasschaert MJA, Grol PTMR, Verdonschot HE. Development of Clinical Practice Guidelines: Evaluation of 2 Methods. *Journal of the Canadian Dental Association*. 2004;70(5): 301-1h.
 19. The AGREE Collaboration. Appraisal of Guidelines for Research & Evaluation. AGREE Instrument, 2001. Available from: <http://www.agreecollaboration.org/pdf/agreeinstrumentfinal.pdf>.
 20. Commonwealth of Massachusetts Regulations, Standards for Management of Tuberculosis Outside Hospitals,. Massachusetts Tuberculosis Nursing Case Management Protocols. Tuberculosis Elimination Achieved through Management. October 2001, CMR 365:000. USA.
 21. Hedal E, Dahle UR, Sandven P, Caugant DA, Brattas N, Waaler HT. Risk factors for recent transmission of *Mycobacterium tuberculosis*. *Eur Respir J*. 2003; 22: 637- 42.
 22. Fredrick AD, Kaona MT, Seter S, Leganji S. An assessment of factors contributing to Treatment adherence and knowledge of TB transmission among patient on TB treatment. *BMC Public Health*. 2004; 4: 68.
 23. Lobato NM, Reves RR, Jasmer MR, Grabau CJ, Bock NN, Shang N. Adverse events and treatment completion for latent tuberculosis in Jail Inmates and homeless persons. *Chest*. 2005; 127: 1296-303.
 24. Cuadras PM, Gutierrez JMP, Sanmartin JLL, Farre MR. Tuberculosis control in the central health region of Catalonia during the period 1986-2000. *Arch Bronconeumal*. 2003; 39: 455: 63.
 25. Morsy AM, Zaher HH, Hassan MH, Shouman A. Predictors of treatment failure among tuberculosis patients under DOTS strategy in Egypt. *Eastern Mediterranean Health Journal*. 2003; 9 (4):689- 701.
 26. Wobeser LW, Yuan L, Naus M, Corey P, Heywood EJ, Holness DL. Expending the epidemiologic profile: risk factors for active tuberculosis in people immigrating to Ontario. *CMAJ*. 2000; 163 (7): 823- 8.

27. Federal Bureau of Prisons. Clinical Practice Guideline: Management of tuberculosis. 2004. Bureau. Available from <http://www.bop.gov/news/medresource.s.jsp>.
28. Tuberculosis Coalition for Technical Assistance (TBCTA). International Standards for tuberculosis care: Diagnosis, Treatment and Public health. 2006. [Http://www.nationaltbcenter/international](http://www.nationaltbcenter/international)
29. Chaulk PC, Kazandjian AV. Directly observed therapy for treatment completion of pulmonary tuberculosis. *JAMA*. 1998; 279: 943- 8.
30. Neff MAT, CDC and IDSA update recommendation on the treatment of tuberculosis. *Am Fam Physician*. Treatment of tuberculosis. *MMWR Recomm Rep*. 2003; 52 (RR-11): 1-77.
31. Ministry of Health and Population, Egypt. National Tuberculosis Program Manual. Cairo:Ministry of Health and Population; 2005.
32. National Institute for Health and clinical Excellence. Tuberculosis: clinical diagnosis and management of tuberculosis, and measures for its prevention and control. Clinical Guideline 33, developed by the National Collaborating Center for Chronic Conditions. 2006; www.nice.org.uk
33. Agboatwalla M, Kazi GN, Shah SK, Tariq M. Gender perspectives on knowledge and practices regarding tuberculosis in urban and rural areas in Pakistan. *Eastern Mediterranean Health Journal*. 2003;9(4):732-40.
34. Kamel MI, Rashed S, Foda N, Mohie A, Loutfy M. Gender differences in health care utilization and outcome of respiratory tuberculosis in Alexandria. *Eastern Mediterranean Health Journal*. 2003; 9 (4): 741-56.
35. Bashour H, Mamaree F. Gender differences and tuberculosis in the Syrian Arab Republic: patients'attitudes, compliance and outcomes. *Eastern Mediterranean Health Journal*. 2003; 9 (4): 757-68.
36. Shukla JS, Warren KD, Woeltje FK, Gruber AC, Fraser JV. Factors associated with the treatment of health-care workers at a Midwestern Teaching Hospital. *Chest*. 2002; 122: 1609- 14.
37. Centers for Disease Control and Prevention (CDC). Guideline for the investigation of contacts of persons with infectious tuberculosis. Recommendations from the National Tuberculosis Controllers Association and CDC. *MMW Recomm Rep*. 2005, 54 (RR-15): 1- 47.
38. Volmink J, Garner P. Directly observed therapy for treating tuberculosis. *Cochrane Database Systematic Review*. 2006; 19 (2): CD003343.
39. Brewer FT, Heymann SJ. To control and beyond: moving towards eliminating the global tuberculosis threat. *Journal of Epidemiology and Community Health*. 2004; 58: 822- 5.
40. Curran ET, Huffman PN, Pratt RJ. Tuberculosis and infection: a review of the evidence. *British Journal of Infection Control*.2006; 7 (2): 18-23.
41. Mohan A, Nassir H, Niazi A. Does routine home visiting improve the return rate and outcome of DOTS patients who delay treatment? *Eastern Mediterranean Health Journal*. 2003;9(4):702-8.
42. Verma G, Upshur EGR, Rea E, Benat RS. Critical reflections on evidence, ethics and effectiveness in the management of tuberculosis: public health and global perspective. *BMC Med Ethics*. 2004; 5: 2-10.
43. Shekelle GP, Woolf HS, Eccles M,

- Grimshaw J. Clinical guidelines: Developing guidelines. *BMJ*. 1999; 318: 593- 6.
44. Edlund W, Gronseth G, So Y, Franklin G. Clinical Practice guideline process manual. American Academy of Neurology; 2004.
45. Richard N. Shekelle, PS, OverhageM, Slutsky J, Grimshaw J, Deshpande MA. Standardized reporting of clinical practice guidelines: A proposal from the conference on guideline standardization. *Annals of Internal Medicine*, 2003; 139 (6): 493- 500.
46. Eccles M., Clapp Z, Grimshaw J, Higgins PCA, Purves BI, Russell I. (1996). Developing valid guidelines: methodological and procedural issues from the North of England evidence based guideline project. *Quality in Health Care*.1996; 5:44-50.