

**Evaluate Standard Practice of Availability of  
Anti-Tuberculosis Drugs used for DOTS in  
Tuberculosis Patients and its Compliance:  
A Randomized Controlled Study in Community  
Pharmacies**

**Thesis submitted to**

**KLE ACADEMY OF HIGHER EDUCATION AND RESEARCH  
(Deemed -to -be -University)**

[Declared as Deemed-to-be-University u/s 3 of the UGC Act, 1956 vide  
Govt. of India Notification No.F.9-19/2000-U.3 (A)]

**Accredited 'A' Grade by NAAC (2<sup>nd</sup> Cycle)  
Placed in Category 'A' by MHRD (GoI)**



***For the award of the degree of  
Doctor of Philosophy  
In the Faculty of Pharmacy***

**By**

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**(Registration No: KLEU/Ph.D./17-18/D-144/DO1217019)**

**Under the Guidance of**

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**2020**

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Affectionately Dedicated

to my

Beloved Parents,

Entire Family

&

Almighty

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## LIST OF ABBREVIATIONS

Sl. No.	Abbreviations	Full Form
1.	TB	Tuberculosis
2.	HIV	Human immunodeficiency virus
3.	WHO	World Health Organization
4.	MDR-TB	Multidrug-resistant tuberculosis
5.	TB/HIV	Human immunodeficiency virus related Tuberculosis
6.	PPM	Public private mix
7.	DOTS	Directly observed treatment, short-course
8.	FIP	International Pharmaceutical Federation
9.	RNTCP	Revised National TB Control Programme
10.	NTEP	National Tuberculosis Elimination Program
11.	NSP	National Strategic Plan
12.	FDC	Fixed-dose combination
13.	ADR	Adverse drug reactions
14.	RMP	Rifampicin
15.	INH	Isoniazid
16.	EMB	Ethambutol
17.	PZA	Pyrazinamide
18.	Min	Minimum
19.	Med	Median
20.	Max	Maximum
21.	ADDO	Accredited drug dispensing outlet
22.	LTBI	Latent tuberculosis infection

23.	DRPs	Drug-related problems
24.	TST	Tuberculin skin test
25.	HRQoL	Health-related quality of life
26.	ICF	Informed consent form
27.	PIS	Participant information sheet
28.	KAP	Knowledge, Attitude and Practice
29.	SNOSE	Sequentially numbered, opaque, sealed envelopes
30.	SES	Socioeconomic Status
31.	MMAS-8	Morisky Medication Adherence Scale-8
32.	HRQoL SF-12	Health-Related Quality of Life, Short form -12
33.	FACIT-SWiP	Functional Assessment of Chronic Illness Therapy - <i>Satisfaction with Pharmacist</i>
34.	D. Pharm	Diploma in Pharmacy
35.	B. Pharm	Bachelor of Pharmacy
36.	M. Pharm	Master of Pharmacy
37.	Govt.	Government
38.	DTO	District TB officer
39.	GoI	Government of India
40.	ICMR-NIRT	Indian Council of Medical Research - National Institute For Research In Tuberculosis
41.	APTI	Association of Pharmaceutical Teachers of India

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## **ABSTRACT**

### **BACKGROUND:**

Community pharmacist's role becomes more significant for patients of chronic diseases like TB. Community pharmacists are the important healthcare professionals to refer TB patients to NTEP, to follow Tuberculosis patients who are seeking treatment in the private sector and to build coordination between the private sector and government sector to eradicate TB from India. By collaborating between Community pharmacists and Clinical pharmacist to deliver the best TB control and care.

### **OBJECTIVES:**

#### **Primary objective:**

1. Evaluation of standard practice of the availability of Anti-tuberculosis drugs used for DOTS in tuberculosis patients and their compliance.
2. To engage community pharmacists to partner NTEP objectives.

#### **Secondary objectives:**

1. To train and certify community pharmacists as a treatment supporter of NTEP.
2. To increase the compliance towards anti-tuberculosis drugs- to improve the quality of life.

### **MATERIALS AND METHODS:**

The studies was conducted in Belagavi City. The survey was conducted to assess the standard practice of Anti-TB drugs in Community pharmacises. The training was conducted to upgrade knowledge, Attitude, and Practice. Randomization

was done to those community pharmacists (30) interested to become treatment supporter NTEP. To check the compliance of tuberculosis patients using Modified Kuppuswamy's Socioeconomic Status (SES) Scale 2019, MMAS-8, FACIT - SWiP, SF-12.

## **RESULTS:**

Surveyed 350 community pharmacies, identified 312 community pharmacies according to inclusion and exclusion criteria and interviewed 228 community pharmacists. We observed that 37.8% of the Community pharmacies dispensing anti-TB drugs. The half-day training was conducted in association with the District Tuberculosis Center, Belagavi, and Regional office of the Deputy Drugs controller, Belagavi. A total of 60 community pharmacists participated in the training. The KAP upgraded from Baseline to 3rd month, and 6th month. Those interested to become treatment supporter of NTEP, Randomization of community pharmacists (30) was done into two groups. In the control group (15 community pharmacists), the only checklist was provided to know the number of tuberculosis patients receiving Anti-TB drugs and referred tuberculosis patients(30) to NTEP was recorded. In the Intervention group (15 Community Pharmacists with clinical pharmacist) screened 59 patients and recruited 50 Pulmonary TB patients and all the patients are referred to NTEP. It was observed that in 6th-month, medication adherence improved to 100%. FACTI-SWiP mean score increased from  $25.24 \pm 0.74$  in the first month to  $27.44 \pm 0.91$  in the 3rd month with a difference in mean being  $2.20 \pm 1.23$ . 5 out of the 50 patients (10%) study participants were illiterate. General health where mean scores were  $13.56 \pm 0.81$  after 6th month and  $11.54 \pm 0.5$  at 1st month, signifying 17.50% overall effect of the intervention on General health.

## **CONCLUSION:**

Continuing pharmacy education related to tuberculosis shows significant outcomes to upgrade in the field of Knowledge, Attitude, and Practice of community pharmacists. The collaborative research between clinical pharmacists and community pharmacists shows the best outcome to control and care of Pulmonary tuberculosis patients.

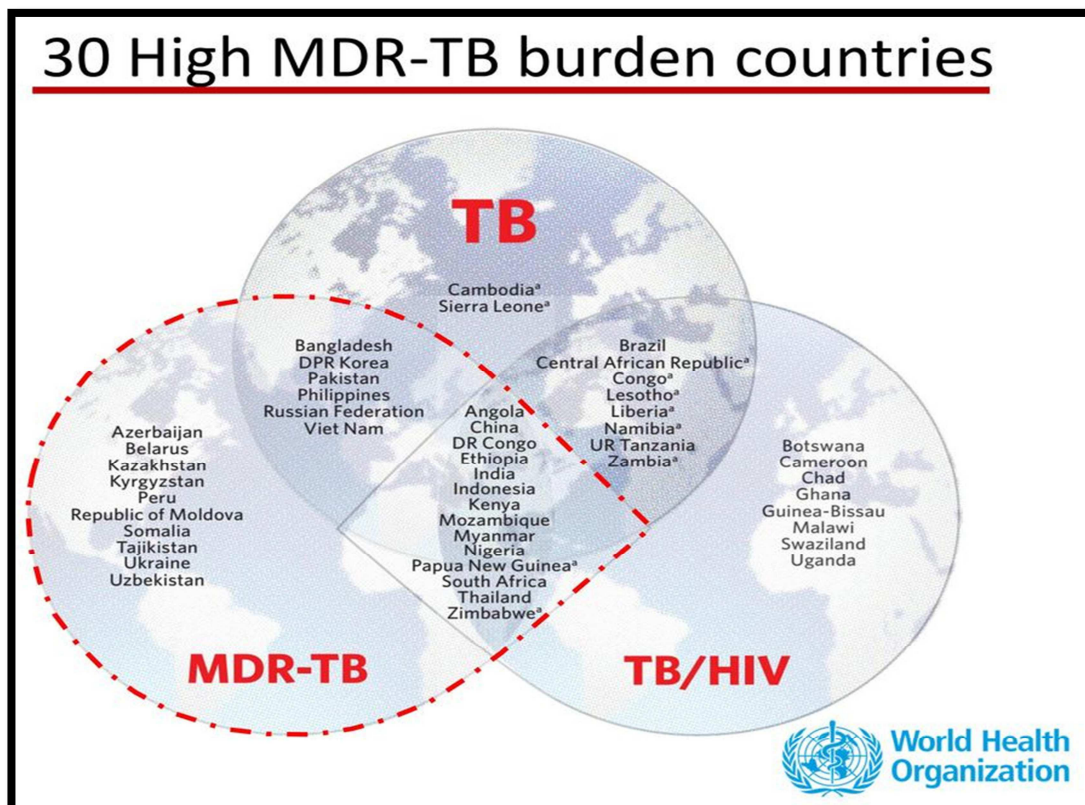
**Keywords:** Community Pharmacists, Clinical Pharmacist, Community Pharmacies, Pulmonary TB patients.

## 1. INTRODUCTION

### 1.1 Background: TB, Global burden, and India.

TB is an infectious disease caused by the bacillus *Mycobacterium tuberculosis*. It typically affects the lungs (pulmonary TB) but can affect other sites as well (extra pulmonary TB). TB is the top infectious killer worldwide. TB is also the leading cause of deaths among people with HIV and a major cause of antimicrobial resistance related deaths [1].

**Fig 1: Countries wise Burden by WHO for the period 2016–2020, and their areas of overlap.**

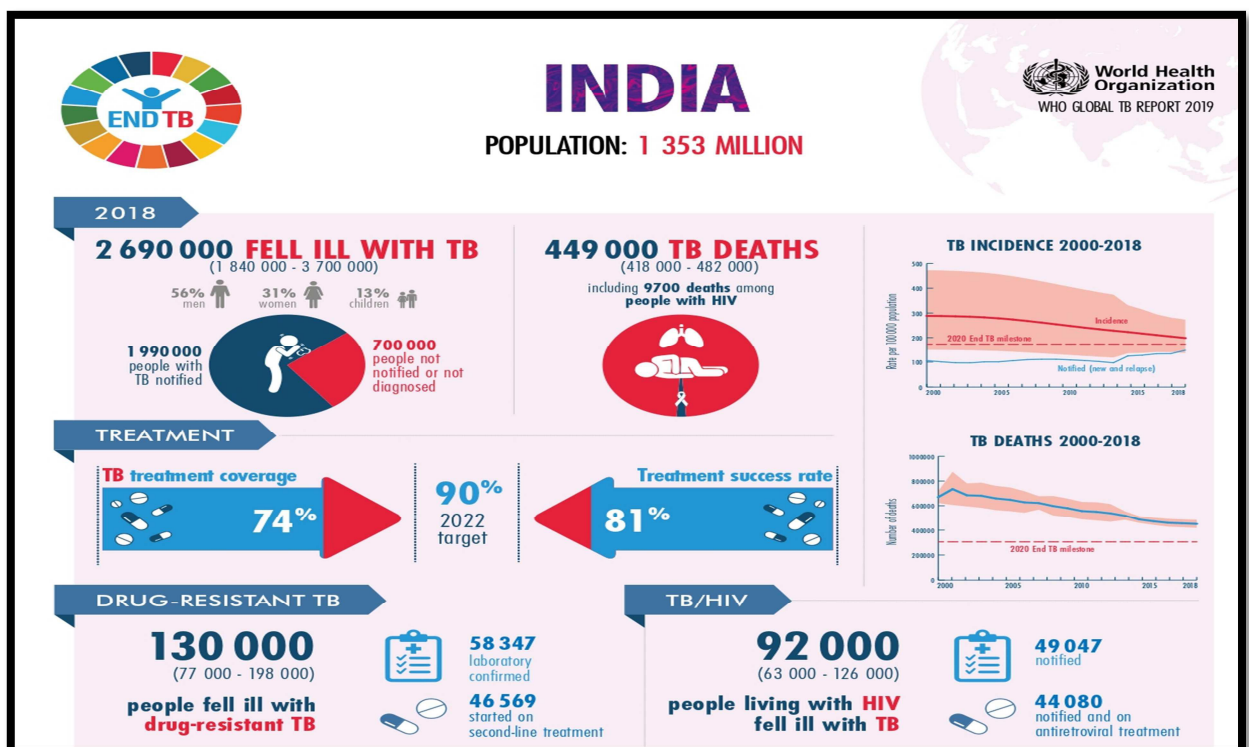


Eight countries accounted for two-thirds of the global TB cases: India (27%), China (9%), Indonesia (8%), the Philippines (6%), Pakistan (6%), Nigeria (4%), Bangladesh (4%) and South Africa (3%) [2].

Fig 2: Global Burden in 2018



Fig 3: India Burden in 2018



### **Public-Private Mix (PPM)**

Expanding access to diagnosis and treatment through community TB care, and public-private mix (PPM) approaches aimed at engaging all care providers in DOTS implementation [3]. WHO and FIP have jointly drawn up the basis for action-oriented collaboration between national TB programs and national pharmacy associations in the fight against TB and MDR-TB [4]. A WHO survey of PPM mediations found that TB case detections were increased in the range between 10% and 36% with the achieved treatment of 90% Pulmonary TB cases [5]. PPM DOTS is now known as ‘PPM for TB Care and Control’ and is a core component of the WHO STOP TB Strategy, entitled ‘Engage All Care Providers’ [6].

### **RNTCP, DOTS, NSP (2017-2025)**

Renamed Revised National TB Control Programme (RNTCP) to National Tuberculosis Elimination Program (NTEP) [7]. The National Strategic plan (NSP) for TB elimination 2017–25 is a framework to guide the activities of all stakeholders including the national and state governments, development partners, civil society organizations, international agencies, research institutions, private sector, and many others whose work is relevant to TB elimination in India [8]. Directly observed treatment short-courses (DOTS) are both practical and effective for the diagnosis, treatment, and monitoring of TB. Each of the five components of DOTS—political and administrative commitment; case detection, primarily by microscopic examination of sputum of patients presenting to health facilities; standardized short-course chemotherapy given under direct observation; an adequate supply of good quality drugs; and systematic monitoring and accountability for every patient diagnosed—is integral to success [9].

**Table 1: Treatment pattern of fixed-dose combination (FDC) with Daily Regimen [10].**

<b>Drug dosages for first line anti- TB drugs</b>			
<b>Drugs</b>	<b>Adult</b>	<b>Children</b>	<b>Maximum in children</b>
Isoniazid	5 mg/kg daily (4 to 6 mg/kg)	10 mg/kg daily (7-15 mg/kg)	300 mg
Rifampicin	10 mg/kg daily (8-12 mg/kg)	15 mg/kg daily (10-20 mg/kg)	600 mg
Pyrazinamide	25 mg/kg daily (20- 30 mg)	35 mg/kg daily (30-40 mg/kg)	2000 mg
Ethambutol**	15 mg/kg daily (12-18 mg/kg)	20 mg/kg daily (15-25 mg/kg)	1500 mg
Streptomycin*	15 mg/kg daily (15-20 mg/kg)	20 mg/kg daily (15-20 mg/kg)	1000 mg

\*Streptomycin is administered only in certain situations, like TB meningitis or if any first line drug need to be replaced due to ADR as per weight of the patient

\*\* Ethambutol is given separately for children to monitor ophthalmic ADR.

**Daily Dose Schedule for Adults (as per weight bands)**

<b>Weight category</b>	<b>Number of tablets (FDCs)</b>		
	<b>Intensive phase</b>	<b>Continuation phase</b>	
	<b>HRZE</b>	<b>HRE</b>	
	<b>75/150/400/275</b>	<b>75/150/275</b>	
25-34 kg	2	2	
35-49 kg	3	3	
50-64 kg	4	4	
65-75 kg	5	5	
>75 kg	6	6	

During treatment if the weight of the patient increases by more than 5 kg and crosses the next weight band category then patient should be given the next higher weight band FDC drugs.

## **Community Pharmacists role in Tuberculosis control and care**

Pharmacies have also been reported as the first point of contact for most TB patients, especially those in urban settings. For example in Delhi, pharmacy workers were the first point of contact and clinical advice for 2/3 of TB patients [11].

India has an estimated 850,000 retail drug outlets. Through a public-private partnership with various entities, approximately 9% of the outlets (n = 75,000) in 12 selected districts across four states of India were engaged over four years and accounted for nearly one-third of India's 1.2 billion people and one-third of its smear-positive TB cases. This partnership reported that approximately 10 to 15% of suspected cases referred by 7,000 pharmacists over two years were found to be positive and placed on treatment [12]. Therefore Community pharmacists are the important healthcare professionals to refer TB patients to NTEP, to follow Tuberculosis patients who are seeking treatment in the private sector and to build coordination between the private sector and government sector to eradicate TB from India. By collaborating between Community pharmacists and Clinical pharmacist to deliver the best TB control and care.

## **1.2 Justification of the Study**

The WHO directed the role of drug retail outlets converted into schematic policies, approaches, and mediation in middle and low-income countries [12]. NTEP training module mainly concentrated on investigating the role of community pharmacists to deliver the best TB treatment and care. The role of community Pharmacists in TB control and care had been neglected. Indian Govt. considers private providers as assets to achieve National strategic plan for TB elimination 2017-2025. The Govt. has not fully tapped the Potential of community Pharmacies to Fight TB. Community Pharmacists shop close to patients' homes so that they do not miss a single dose. Providing DOTS as per patient convenience through community treatment supporter of NTEP with periodic monitoring may reduce the treatment Default.

### **1.3 Research Hypothesis**

**Null Hypothesis (H<sub>0</sub>):** There is no statistical significant difference between trained community pharmacists and untrained community pharmacists among control and interventional group.

**Alternative Hypothesis:** There is a statistical significant difference between trained community pharmacists and untrained community pharmacists among control and interventional group.

## **1.4 Objectives**

### **Primary objective:**

1. Evaluation of standard practice of the availability of Anti-tuberculosis drugs used for DOTS in tuberculosis patients and their compliance.
2. To engage community pharmacists to partner NTEP objectives.

### **Secondary Objectives:**

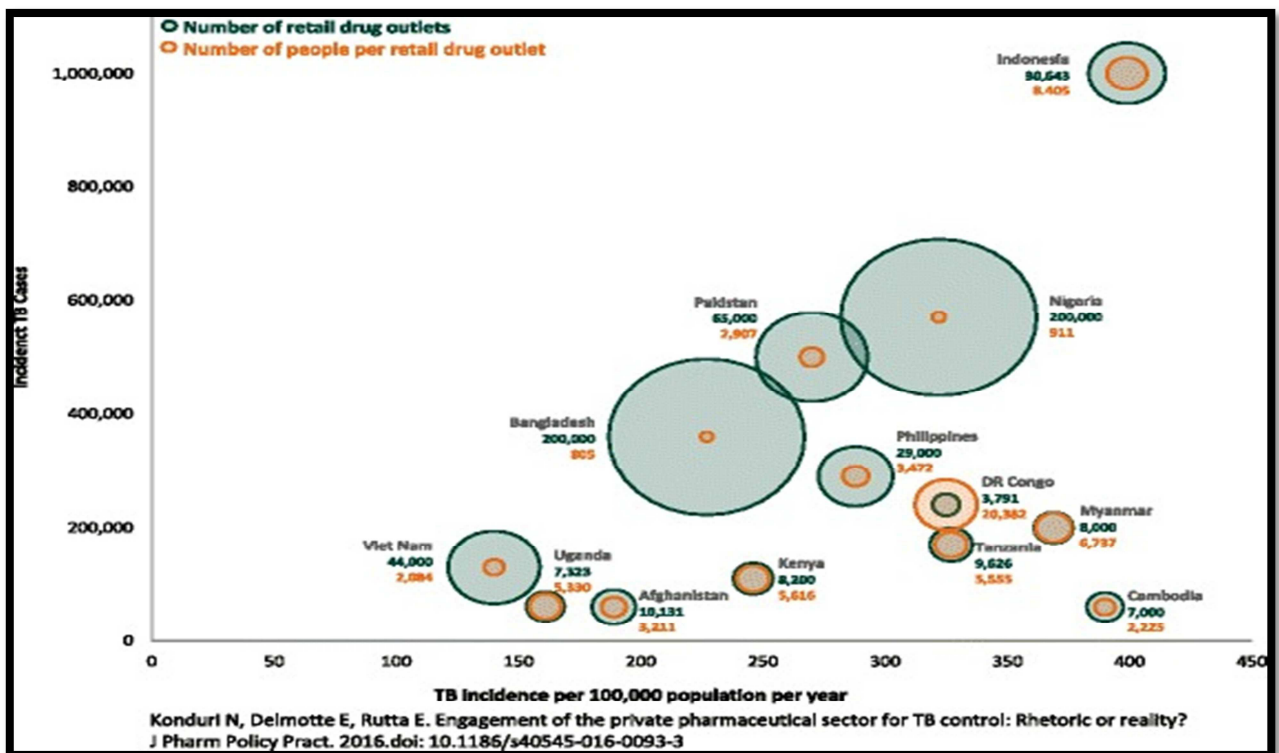
1. To train and certify community pharmacists as treatment supporter of NTEP.
2. To increase the compliance towards anti-tuberculosis drugs- to improve the quality of life.

## 2. REVIEW OF LITERATURE

### 2.1 Survey of Community Pharmacies Related to Anti-tuberculosis

Estimated 13 high TB burden countries related to community pharmacies with the population in which Indonesia was high [12].

**Fig 4: 13 high TB burden countries related to community pharmacies with the population.**



This study was documented a small market for TB drug sales in private pharmacies and suggested that the private sector contributes little to managing TB in Bolivia. The proportion of pharmacies selling TB drugs in Cochabamba was 25% (of 100) [13].

**Table 2: Availability and cost of Anti-Tuberculosis drugs**

Availability and cost of anti-tuberculosis drugs in private pharmacies in Cochabamba, Bolivia					
	Pharmacies Total: 100		Unit cost (Euro cents)		
	Selling <i>n</i> (%)	Giving price <i>n</i> (%)	Min	Med	Max
RMP (300 mg)	23 (23)	26 (26)	4.4	12.1	19.8
INH (150 mg)	16 (16)	17 (17)	2.2	8.8	13.2
EMB (400 mg)	5 (5)	10 (10)	3.9	7.7	22.0
PZA (500 mg)	1 (1)	3 (3)	3.6	13.8	16.5
At least one drug	25 (25)				
Four drugs	1 (1)				

RMP = rifampicin; INH = isoniazid; EMB = ethambutol; PZA = pyrazinamide; Min = minimum; Med = median; Max = maximum.

A cross-sectional study was conducted, surveyed investigation information, work on, preparing, and accessibility of medications in drug stores. The pharmacist had determined 95% of cough is one of the symptoms of TB and referred health care centers, 1% finished coaching, and dispensing 8% of first-line drugs which are lawfully restricted [14].

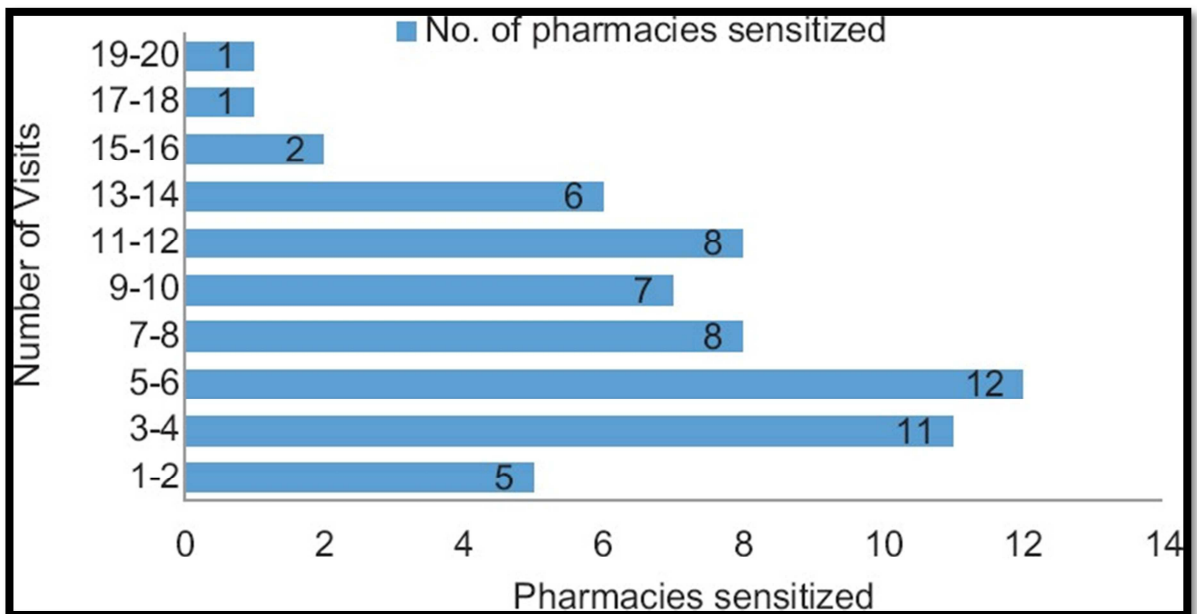
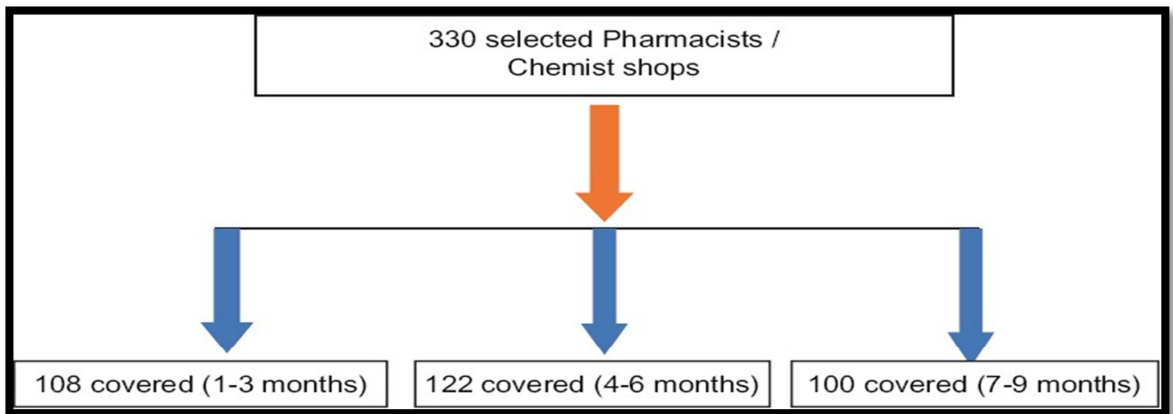
**Table 3: Availability of Anti-tuberculosis drugs**

Availability of anti-tuberculosis medicines at retail outlets			
	Type of outlet		Total ( <i>n</i> = 295) <i>n</i> (%)
	Pharmacy ( <i>n</i> = 122) <i>n</i> (%)	ADDO ( <i>n</i> = 173) <i>n</i> (%)	
Anti-tuberculosis drugs stocked			
First-line drugs*	22 (18)	3 (2)	25 (8)
Second-line drugs†	83 (68)	86 (50)	169 (57)*

\* Sale prohibited by law at retail outlets.  
† May be legally stocked in retail pharmacies because they are used to treat a variety of other conditions.  
‡ Over 95% of pharmacies and ADDOs stocked fluoroquinolones (ciprofloxacin, levofloxacin and ofloxacin); the remaining pharmacies only stocked kanamycin and amikacin.  
ADDO = accredited drug dispensing outlet.

A prospective study was conducted. Compliance with the pharmacists was upgraded by Continues follow up from field investigator. After six months 46% of community pharmacies were sensitized referring TB patients [15].

**Fig 5: Project time and Sensitization of community pharmacies**



## 2.2 Knowledge, Attitude and Practice of Community Pharmacist

A survey conducted in which 75% of 24 community pharmacy employees were unauthorized professionals and most of them very less knowledge of Antibiotics. Interestingly, they are practicing to dispense antibiotics in the absence of a prescription [16].

A cross-sectional study was conducted using smart phones of 45 randomly selected pharmacies. Most participants expressed interest in learning more about TB and expanding their involvement in the fight against TB in their community. Pharmacy workers have adequate knowledge about TB. However, we identified gaps in knowledge with respect to the prevention of TB transmission [17].

**Table 4: Pharmacists knowledge (Total = 45)**

Question/Topic	n	%
Knowledge that TB transmission is airborne	44	97.8
Knowledge that TB is frequent in Peru	43	95.6
Knowledge that drug-resistant TB is a serious problem in Peru	43	95.6
Knowledge that TB is almost always a curable disease	37	82.2
Knowledge that sputum evaluation is an effective diagnostic test for pulmonary TB	37	82.2
Knowledge that the most effective TB treatment is given by public health establishments	36	80.0
Knowledge that cough is the most common symptom of pulmonary TB	35	77.8
Knowledge that TB is frequent in El Agustino	32	71.1
Knowledge of the consequences of not completing TB treatment or taking it irregularly	32	71.1
Knowledge that TB is highly contagious	30	66.7
Knowledge of ways to avoid transmission of TB	11	24.4

<https://doi.org/10.1371/journal.pone.0196648.t002>

A cross sectional survey shows, 80% of community pharmacists are referring presumptive TB patients to chest physicians and 83% are interested to take TB related training [18].

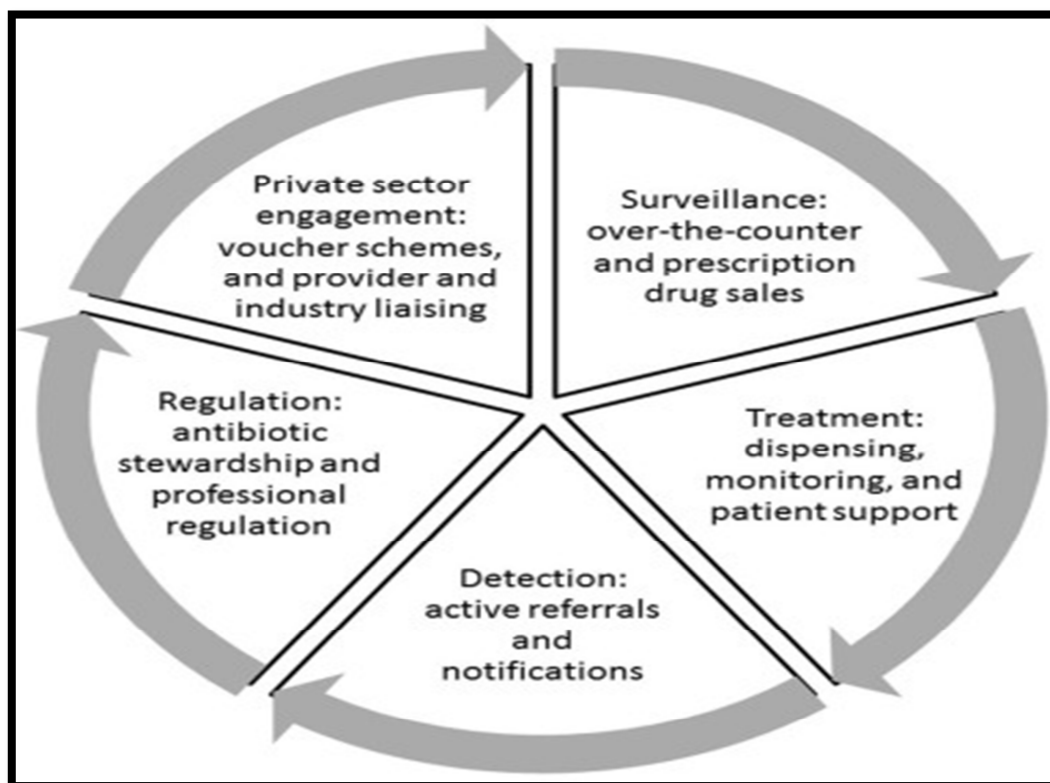
**Table 5: Knowledge assessment of Community pharmacists**

districts of Pakistan's Punjab province (n = 1080)				
Attitude and Practices	Urban (n = 432)	Rural (n = 648)	P value	OR (95% CI)
	n (%)	n (%)		
What would you do if you suspect you had symptoms of TB? ( <i>Intended health seeking behavior</i> )				
Health Facility	419 (97.0)	610 (94.1)	P = 0.030	2.01 (1.06-3.82)
Pharmacy	9 (2.1)	29 (4.5)	P = 0.037	0.45 (0.21-0.97)
Traditional Healer	2 (0.5)	23 (3.5)	P = 0.001	0.13 (0.03-0.54)
Self Treatment	1 (0.2)	9 (1.4)	P = 0.058	0.17 (0.02-1.31)
Others	6 (1.4)	8 (1.2)	P = 0.826	1.13 (0.39-3.27)

### 2.3 Pharmacist as treatment supporter/ DOTS Provider of Tuberculosis

Reviewed upgrading the functions of TB by community pharmacists [19].

**Fig 6: Cycle showing function of community pharmacists**



81 % of community pharmacists are actively participated in TB related public-private mix (PPM) program [20].

A prospective study was conducted to know the treatment-seeking pathway under RNTCP. 64.5% are seeking TB treatment from private physicians and 19.1% by community pharmacists [21].

Investigated feasibly to analyze pharmacies as DOTS providers. To make community DOTS by pharmacies, 60% requires “knowledge and information” and 50% “requires manpower in pharmacy” [22].

According to cross sectional survey 90% of community pharmacies could play treatment supporter of DOTS [23].

**Table 6: Pharmacist's perceptions of TB control and care.**

Roles of pharmacists	Pharmacists' perception n (%)		
	Yes	No	Do not know
To provide and manage the use of anti-TB medicines	114 (97.4)	1 (0.9)	2 (1.7)
To provide information on anti-TB medicines	114 (97.4)	0	3 (2.6)
To integrate and collaborate with other health-care providers in the care of TB patients	95 (81.2)	14 (12.0)	8 (6.8)
Supervisors to the TB patients regarding their medications	91 (77.8)	21 (17.9)	5 (4.3)
Early inventors of patients with suspected TB	31 (26.5)	72 (61.5)	14 (12.0)
To improve adherence of TB patients to their medications	107 (91.5)	8 (6.8)	2 (1.7)
To monitor and educate patients about side effects of TB medications	111 (94.9)	3 (2.6)	3 (2.6)
To monitor the distribution and use of TB drugs in communities	92 (78.6)	17 (14.5)	8 (6.8)
To educate people on TB and its treatment	106 (90.6)	5 (4.3)	6 (5.1)
To monitor drug therapy	104 (88.9)	10 (8.5)	3 (2.6)

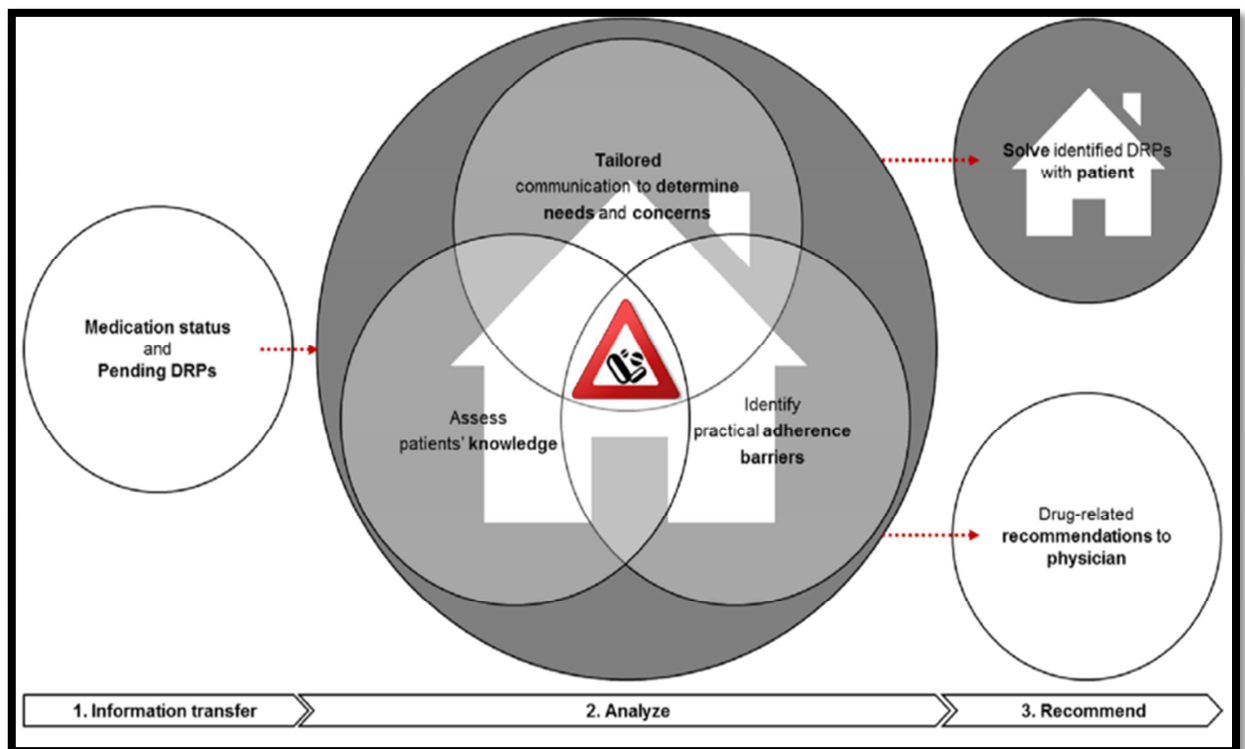
TB: Tuberculosis

## 2.4 Roll of Community Pharmacist and Clinical pharmacist on tuberculosis

After the evaluation, 94% completed LTBI treatment run by clinical pharmacists [24].

83.6% of DRPs identified and 91.6 % were solved by collaborative interventions between hospital pharmacists and community pharmacists during home visit of discharged patients [25].

**Fig 7: DRP (Drug Related Problem)**



TB patients are satisfied by pharmacists on administration of Mantoux tuberculin skin test (TST) [26].

## **2.5 Medication adherence and Quality of life of Tuberculosis Patients**

HRQoL shows, 23% of TB patients were at the risk of depression at the end of their TB treatment [27].

Counseling with leaflets had better impact on medication adherence of TB patients [28]

### **3. MATERIALS AND METHODS**

**3.1 Study site:** The studies were conducted in Belagavi City.

**3.2 Study population:** Community Pharmacists was the target population for this study.

**3.3 Study design:** This was a randomized controlled study where the participants were randomized into two groups i.e. interventional or study group and control group.

**3.4 Sample Size:** As per the Regional office of the Deputy Drugs controller, Belagavi about 350 Community pharmacies are available in Belagavi City.

**3.4.1 Statistical test:** Statistical methods like Cochran's Q Test, Dependent t-test, Karl Pearson's correlation coefficient, One-way ANOVA, Wilcoxon matched-pairs test were used to analyze the data generated from the study.

**3.5 Participant selection and recruitment:** Information regarding the target population was community pharmacists. Those who satisfy the eligibility criteria were recruited.

#### **3.6 Eligibility Criteria:**

##### **3.6.1 Inclusion criteria –**

- Registered pharmacist.
- Consenting to be part of NTEP-DOTS.
- Pulmonary tuberculosis patients ( $\geq 18$  years).

### **3.6.2 Exclusion criteria –**

- Drug distributors/wholesale shop
- In-house hospital pharmacist
- No availability of community pharmacists
- Those community pharmacists were not willing to participate.

**3.7 Informed consent process:** Informed consent form (ICF)/ Participant information sheet (PIS) in English or other patient preferred local languages like Kannada and Marathi were provided for the eligible community pharmacists and patients. Brief information about the study, its purpose, benefits, and risks involved in the participation of the study, study duration, randomization, monitoring, confidentiality, rights of the participants to withdraw from the study were informed to the community pharmacists and patients. The Community Pharmacist and Patient understanding of the study were cross-verified. Concerns and queries regarding the study were addressed. Once the community pharmacists and patients agreed to participate in the study, two copies of ICF were signed by the community pharmacist and patient, out of which one was given to the community pharmacist and patient reference and one was taken by the investigator for documentation [Annexure I].

**3.8 Program context:** The interventions were conducted in Belagavi City, India. Along with Partnership of KLE Pharmacy of Pharmacy, District TB Control Centre, Regional office of the Deputy Drug Controller.

### **3.9 Study procedure, Study instruments and Questionnaires design [as per flow chart .1]**

**3.9.1 Survey:** Surveyed 350 community pharmacies and identified 312 community pharmacies according to inclusion and exclusion of our study.

*Community Pharmacists information leaflet* [Annexure II]: Community Information leaflet was developed and validated in English and Kannada language. The information includes the objectives of our study and the role of community pharmacists in TB prevention and care. At the time of the Survey, Community Pharmacist information leaflet was provided to every community pharmacist.

*Survey questionnaires design* [Annexure III]: The detail of survey questionnaires developed and validated which includes:

- i.** Details of community Pharmacies/ Community Pharmacists.
- ii.** Interested to take part in Continuing Pharmacy Education.
- iii.** Knowledge of Tuberculosis disease.
- iv.** Storing of Anti-TB drugs.
- v.** Interested to take part in NTEP objectives.
- vi.** Dispensing pattern of Anti-TB drugs.

**3.9.2 Training:** The half-day training was conducted in association with the District Tuberculosis Center, Belagavi, and Regional office of the Deputy Drugs controller, Belagavi. After the survey, 60 Community pharmacists from various areas of Belagavi city consented to attend the training program.

**Training Module:** Training was conducted as per official NTEP training module for community pharmacist.

**3.9.3 Assessment of Knowledge, Attitude and Practice (KAP):** The total 60 community pharmacists participated in the training. Before the beginning of training, we administered KAP questionnaires to the community pharmacists to assess the baseline knowledge, attitude and practice level. To assess the post-training impact, the same KAP questionnaires were used after 3<sup>rd</sup> month and 6<sup>th</sup> month of the study.

**Knowledge, Attitude, and Practice Questionnaires** [Annexure IV & V]: The questionnaire was developed and validated to test the knowledge, attitude, and practice of community pharmacists. The Questionnaires consisted of four sections.

- i. First section:** Consisted of Demographic details of community pharmacists (Name, Gender, Age, Education, Experience and Address).
- ii. Second section:** Consisted ('True' or 'false') of Knowledge of community pharmacists related to TB infection and control awareness of TB transmission, TB symptoms.

- iii. **Third section:** Consisted ('Yes or No') of 'Attitude and Practice of community pharmacists' (Patient therapy, Public-Private mix, TB care, and Mobile Application use).
- iv. **Fourth section:** Consisted (Tick right Answer) of 'Attitude and Practice of community pharmacists towards National Strategic plan (2017-25).

**3.9.4 Randomization:** After the training, the 30 community pharmacists were interested to become a treatment supporter of NTEP. Once community pharmacists satisfy the eligibility criteria and consent was taken, Randomized 30 community pharmacists into two equal groups. 15 community pharmacists in the control group and 15 community pharmacists in the Intervention group.

***SNOSE method:*** Computer-generated simple randomization was employed, while the SNOSE method was used to randomly allow participants to control group or intervention group. Envelopes are opened sequentially only after participant details are written on the envelope.

***The control group*** (without Clinical Pharmacist): In the control group (15 community pharmacists), the only checklist was provided to know the number of tuberculosis patients receiving Anti-TB drugs and referred tuberculosis patients to NTEP was recorded. All the patients who are referred to NTEP by community pharmacists were followed TB notification reporting format [Annexure X].

***The Intervention Group*** (With Clinical Pharmacist): In the Intervention group (15 Community Pharmacists) recruited Pulmonary TB patients to

check the compliance of tuberculosis patients using Modified Kuppuswamy's Socioeconomic Status (SES) Scale 2019, MMAS-8, *FACIT - SWiP*, SF-12. Referred TB patients was recorded. All the patients who are referred to NTEP by community pharmacists were followed TB notification reporting format [Annexure X].

### **3.9.5 Intervention by clinical pharmacist**

*Recruitment of Pulmonary TB patients:* Screened 59 pulmonary Tuberculosis patients and recruited 50 patients who are receiving Anti-TB drugs from community pharmacies.

*Supervision and monitoring:* Clinical pharmacists visited community pharmacies for post-training (3<sup>rd</sup> and 6<sup>th</sup> month) to assess the implementation of Community pharmacists Knowledge, Attitude, and Practice to deliver the best TB services.

*Modified Kuppuswamy's Socioeconomic Status (SES) Scale 2019* [Annexure VI]: Assessment of family income per month. The score 3-29 which includes education and occupation of the head of the family and it arranges community into 5 groups i.e “Lower”, “Upper lower”, “Lower middle”, “upper-middle”, “Upper” [29].

*Morisky Medication Adherence Scale (MMAS-8)* [Annexure VII]: One of the best self-reporting measures for assessing medication enforcement. The MMAS-8's reliability and validity were or have already been evaluated in many languages through diverse cultures, environments, and diseases [30].

***FACIT- Satisfaction With Pharmacist (SWiP)*** [Annexure VIII]: The seven elements on the Pharmacist Satisfaction (SWiP) scale was graded on a Likert scale of five points (0 = not at all to 4 = very much) [31]. TB patients feedback towards community pharmacists was recorded.

***Health-related QoL (SF-12)*** [Annexure IX]: The questions were grouped, graded, and weighted to establish two measures that offer insight into mental and physical activity and general quality of life relevant to health [32].

**Compliance:** Clinical pharmacist and Community pharmacist's collaborative interventions had proved a better outcome of TB control and care.

### **3.10 Data Collection:**

- Surveyed in Belagavi city by using Survey questionnaire.
- The training was conducted according to the NTEP training module for community pharmacists.
- Community pharmacists' consent was taken to partner NTEP objectives.
- Those interested community pharmacists to become treatment supporter of NTEP-DOTS were randomized.
- Assessed KAP of community pharmacists (Baseline, 3<sup>rd</sup> month and 6<sup>th</sup> month)
- In the control group, a checklist was provided to assess the number of patients taking Anti-TB drugs from community pharmacies. Referred of TB patients to NTEP were recorded.
- In the Intervention group, Clinical pharmacist and Community pharmacist's collaborative interventions for better outcome of TB control and care was

assessed by using Modified Kuppuswamy's Socioeconomic Status (SES) Scale 2019, MMAS-8, *FACIT - SWiP*, SF-12.

### **3.11 Study Materials:**

1. Informed Consent Form (ICF).
2. Community Pharmacist Information Leaflet.
3. Survey Questionnaire for Community Pharmacist.
4. NTEP: Training Module for the Community Pharmacist.
5. KAP Questionnaire for community Pharmacist.
6. Modified Kuppuswamy's Socioeconomic Status (SES) Scale 2019.
7. *FACIT-SWiP – Functional Assessment of Chronic Illness Therapy - Satisfaction with Pharmacist* (Version 4).
8. Morisky Medication Adherence Scale (MMAS-8).
9. Health-self-assessment-SF-12.

### **3.12 Study outcomes measures**

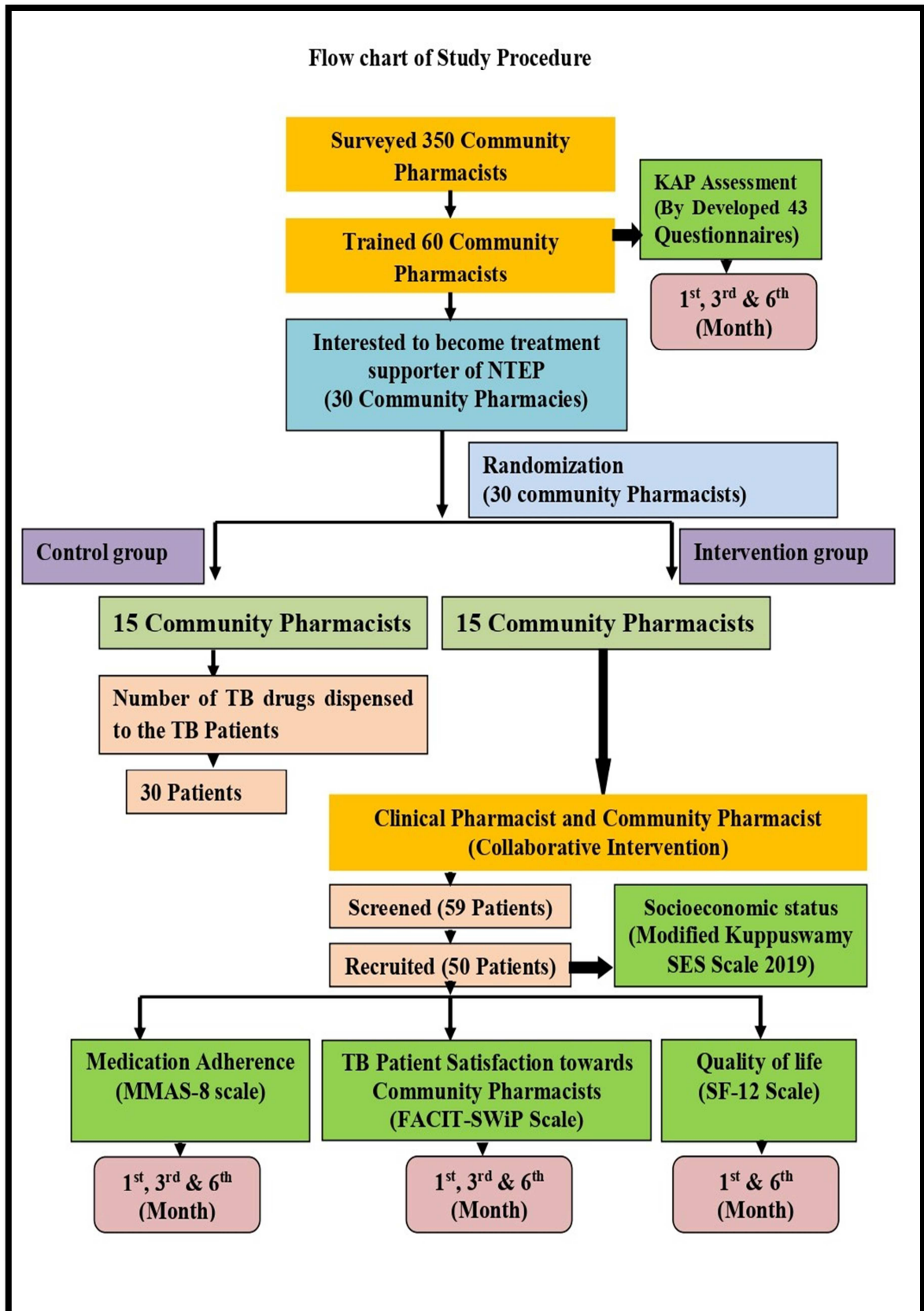
- **Primary outcomes:**

1. Evaluation of standard practice of availability of Anti-Tuberculosis drugs used for DOTS in Tuberculosis patients in community pharmacies.
2. To strengthen community pharmacists to partner NTEP objectives.
3. To implement TB notification form Community pharmacies

- **Secondary outcomes:**

1. Train and certify community pharmacies as a treatment supporter.
2. Effectiveness of implementing the DOTS through the clinical pharmacist.
3. Assessed the Compliance, Adherence, and Quality of life towards of TB patients.

3.13 Study procedure of flow chart



## 4. RESULTS

In India, the availability of community pharmacies (800,000) were more. In this aspect, by providing TB drugs in free of cost, the National Tuberculosis Elimination Program (NTEP) mandated to include community pharmacies with government health services [33]. For most of the patients, community pharmacies are the first point of contact [34]. In this study, we evaluate the standard practice of dispensing patterns of Anti-TB drugs by community pharmacists and also to understand the current trend of privately treated pulmonary tuberculosis patients. By this we upgraded the KAP of community pharmacists by training. For better outcome of compliance, Clinical pharmacist and Community pharmacists were collaborated.

The study was implemented in Belagavi, Karnataka, India with a population of approximately 5 lakh residents. The study population encompassed registered pharmacists, with the availability and non-availability of anti-TB drugs and consenting to be part of treatment supporter of Anti-tuberculosis drugs. A total of 350 Community pharmacies are available as per the Regional office of the drugs controller, Belagavi. In our study, 312 Community pharmacies were identified. With the help of Survey questionnaires and community information leaflets, 228 community pharmacies were interviewed in the study. After a detailed survey, 60 Community pharmacists from various areas consented to attend the training program. The training program was conducted by the Department of Pharmacy Practice, KLE college of Pharmacy, in association with the District TB control office, Belagavi, and Regional office of the Deputy Drugs Controller, Belagavi. Data on Knowledge, Attitude, and Practice were collected via 43 developed

questionnaires at Before training, 3<sup>rd</sup> month, and 6<sup>th</sup> month of the study. After the training program, 30 community pharmacists expressed their interest to become a treatment supporter of Anti-TB drugs. By randomization, the interested community pharmacists were divided into two groups *viz.* control and intervention group.

In the control group (without Clinical pharmacists). The only checklist was provided to know the number of tuberculosis patients receiving Anti-TB drugs. 30 Patients were enrolled and all the patients to NTEP were recorded. Patients follow-up was not performed in this group.

Intervention Group (With Clinical Pharmacist). A total of 59 TB patients were screened and recruited 50 patients in community pharmacies and all the patents are referred to NTEP. To check the compliance and medication adherence, Socioeconomic status and Quality of life was checked using Modified Kuppuswamy's Socioeconomic Status (SES) Scale 2019, MMAS-8 (1<sup>st</sup> 3<sup>rd</sup> & 6<sup>th</sup> month), FACIT – SwiP (1<sup>st</sup>, 3<sup>rd</sup> & 6<sup>th</sup> month), SF-12 (1<sup>st</sup> & 6<sup>th</sup> month).

59 patients in the intervention group were screened and 50 of them recruited for the study. Socioeconomic status was assessed by Modified Kuppuswamy scale 2019 and the patients were evaluated for medication adherence, satisfaction towards Community pharmacists, and quality of life by SF-12 scales. The data collected were based on previously agreed data points and tabulated using Microsoft Excel. Descriptive statistical analysis was performed and results were analyzed as given below.

#### 4.1 Survey

Interviewed 228 selected Community pharmacists on various aspects to assess their eligibility and interest for training on NTEP guidelines. Data was collected via by distributing community information leaflet, questionnaires, and analyzed as follows:

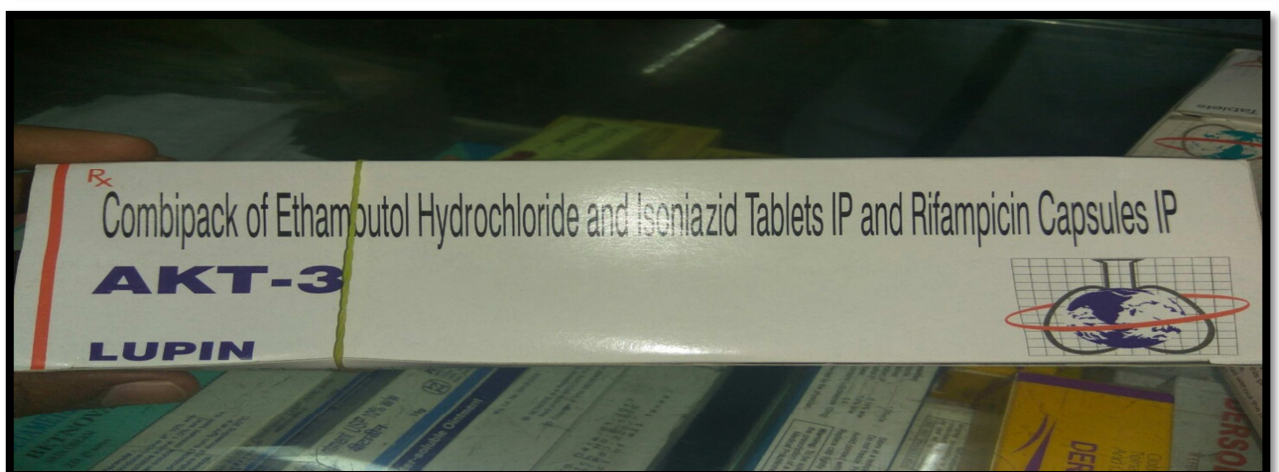
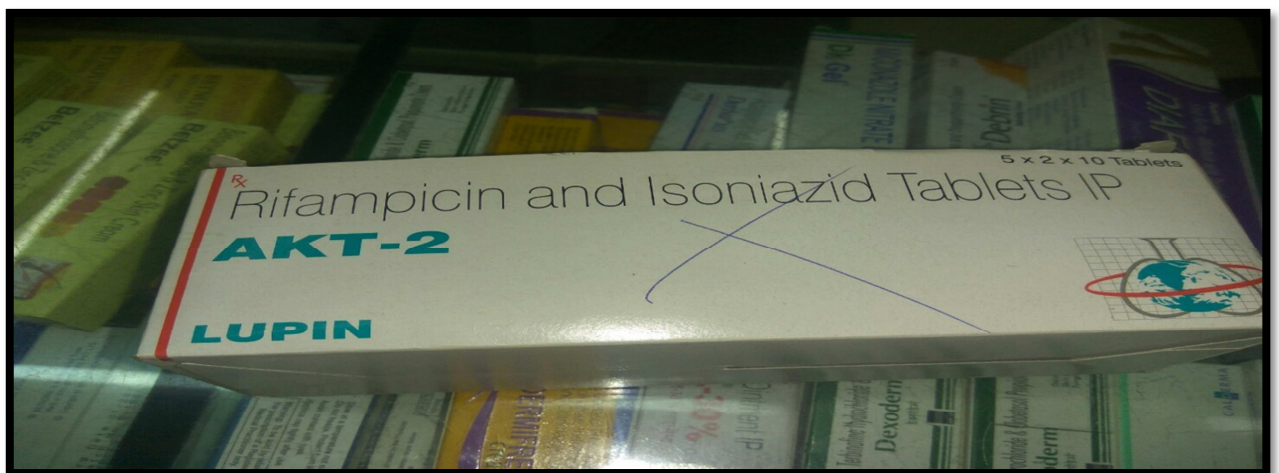
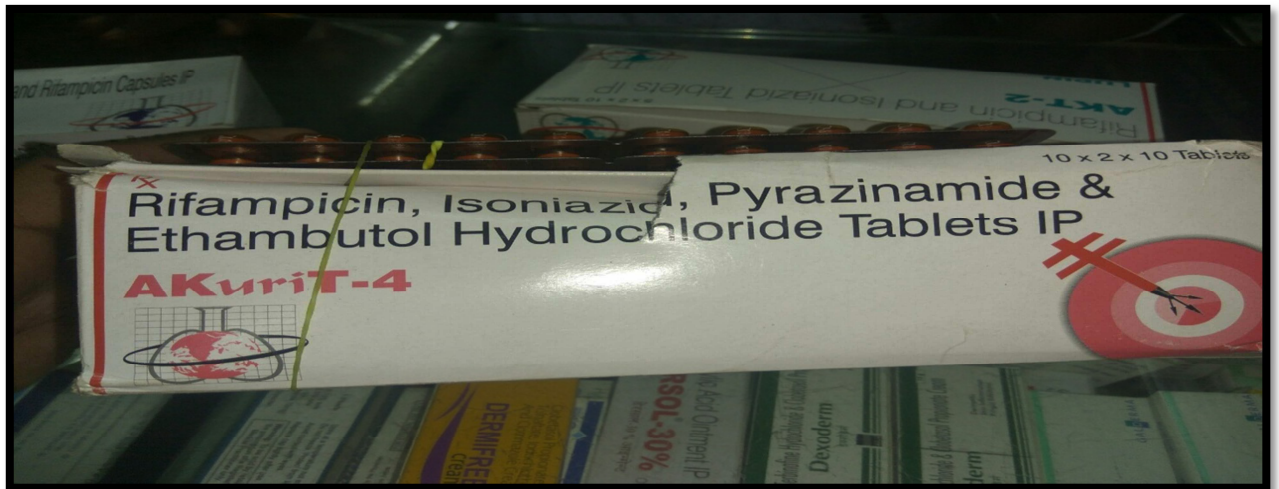
##### 4.1.1 Survey Photos



4.1.1 Survey Photos



4.1.2 Availability of Anti-TB drugs on the time of the survey



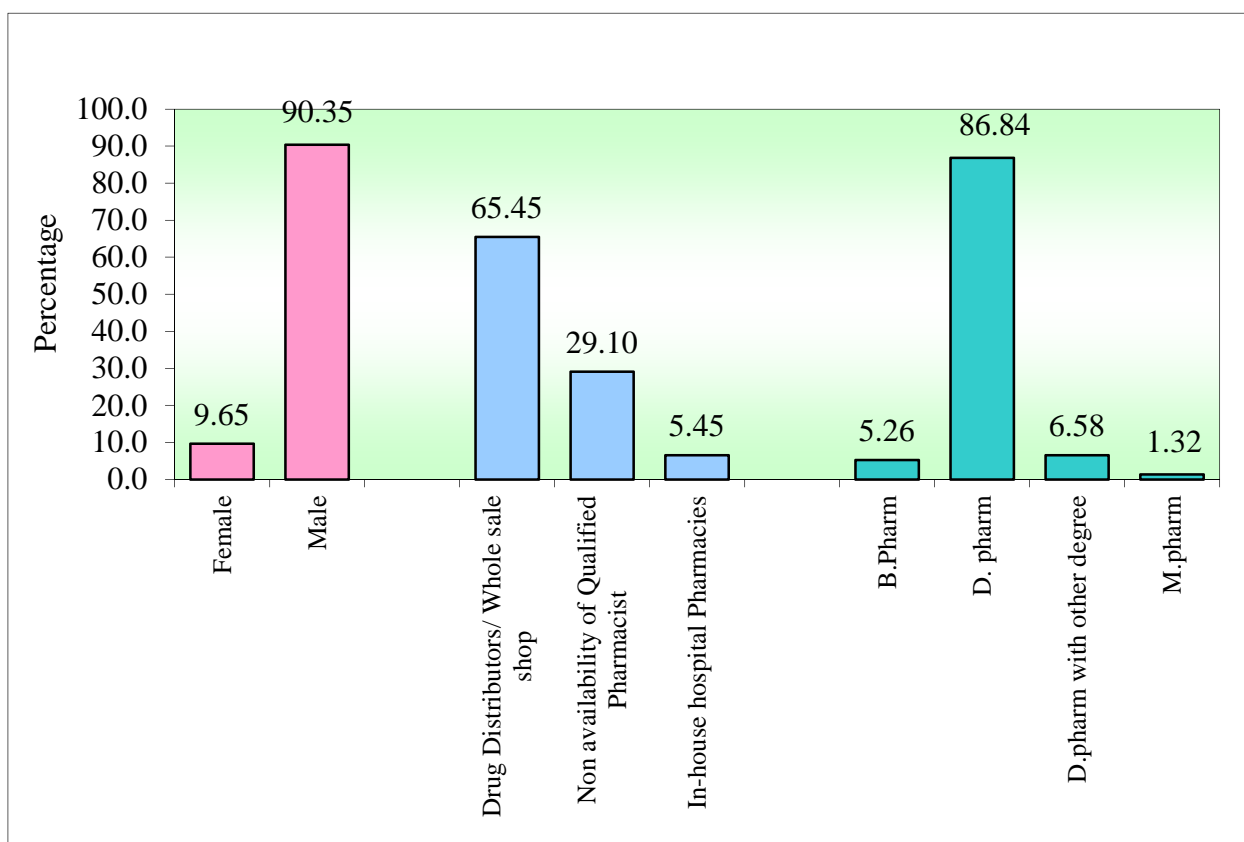
**4.1.3 Distribution of community pharmacists by gender and qualification.**

A total of 228 community pharmacists were interviewed and 90.35% were found to be males. The number of female pharmacists was significantly lower (9.65%). At the time of the survey, we excluded 65.45% wholesale shops or drug distributors accounted for, 5.45% consisted of in-house pharmacies at hospitals, 29.10% were non-availability of registered pharmacists. Qualification wise, 86.84% of the community pharmacists have a Diploma in Pharmacy (D. Pharm.). 6.58% of the community pharmacist had D. Pharm with other degrees. 12 community pharmacists (5.26 %) had Bachelor of Pharmacy (B. Pharm) degree and only 3 community pharmacists (1.32%) with Master of Pharmacy (M. Pharm). The data has been summarized in Table 7 and Figure 8.

**Table 7: Distribution of community pharmacists by gender and qualification.**

	No. of pharmacists	%
<b>Gender</b>		
Male	206	90.35
Female	22	9.65
Total	228	100
<b>Others</b>		
Drug Distributors/ Wholesale shop	180	65.45
The non-availability of Qualified Pharmacist	80	29.10
In-house hospital Pharmacies	15	5.45
Total	275	100
<b>Qualifications</b>		
B.Pharm	12	5.26
D. Pharm	198	86.84
D.Pharm with other degree	15	6.58
M.Pharm	3	1.32
Total	228	100.00

**Figure 8: Graph showing the distribution of community pharmacists by gender and qualification.**



#### 4.1.4 Distribution of pharmacists based on continuing pharmacy education.

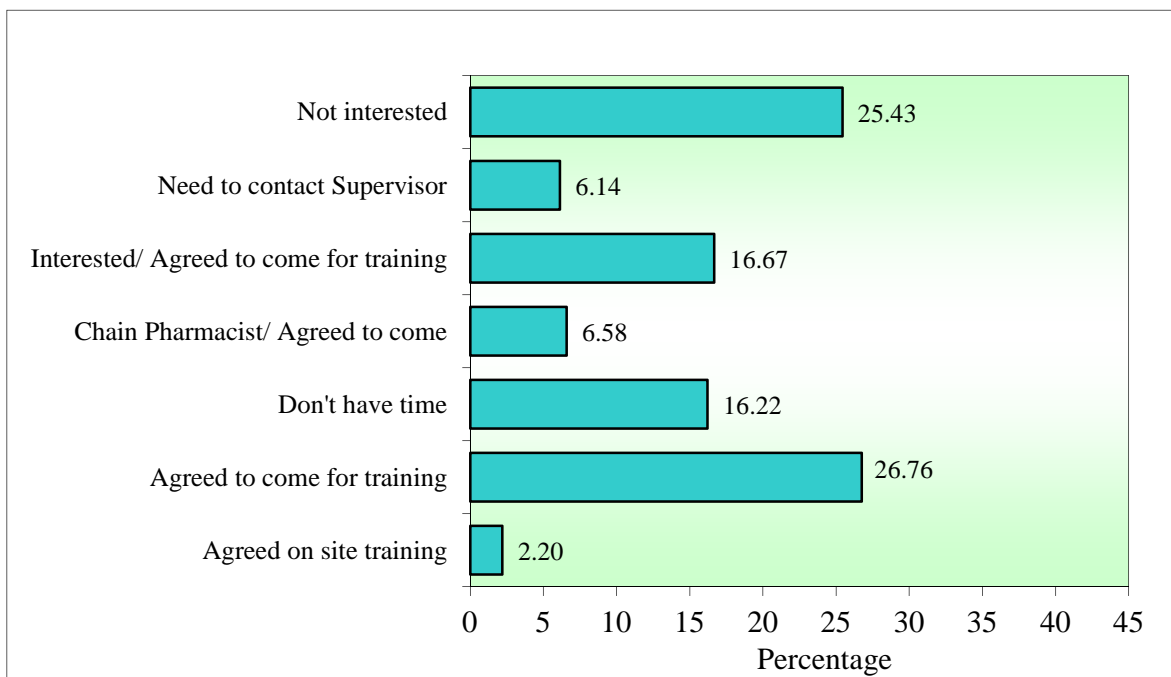
To update community pharmacist's knowledge, attitude, and practice by continuing pharmacy education is important to patient treatment and care. Data on this aspect was collected via questionnaire and has been consolidated in Table 8 and Figure 9. Of the 228 Community pharmacists interviewed, 61 pharmacists (26.76%) agreed to come for the training. 5 of them agreed for on-site training which accounted for 2.20%. 15 of the Community pharmacist (6.58%) were chain pharmacists and agreed to come for the training. Whereas 38 Community pharmacists (16.67%) showed interest in the study and also agreed to come for training. 6.14% (14 in number) of the Community pharmacist informed that they

need to contact supervisors before giving an opinion. 58 of the 228 Community pharmacists were not interested in participating in the study and this accounted for 25.43% of the total number. 37 of them (16.22%) cited lack of time as the primary reason for declining participation. The percentage of pharmacists who were interested to take continuing Pharmacy education and being updated on the TB programs was 52.21%.

**Table 8: Distribution of pharmacist based on continuing pharmacy education.**

<b>Continuing pharmacy education</b>	<b>No. of pharmacists</b>	<b>%</b>
Agreed on-site training	5	2.20
Agreed to come for training	61	26.76
Don't have time	37	16.22
Chain pharmacists/ Agreed to come	15	6.58
Interested and Agreed to come for training	38	16.67
Need to contact Supervisor	14	6.14
Not interested	58	25.43
Total	228	100.00

**Figure 9: Graph showing the distribution of community pharmacists by gender and qualification.**



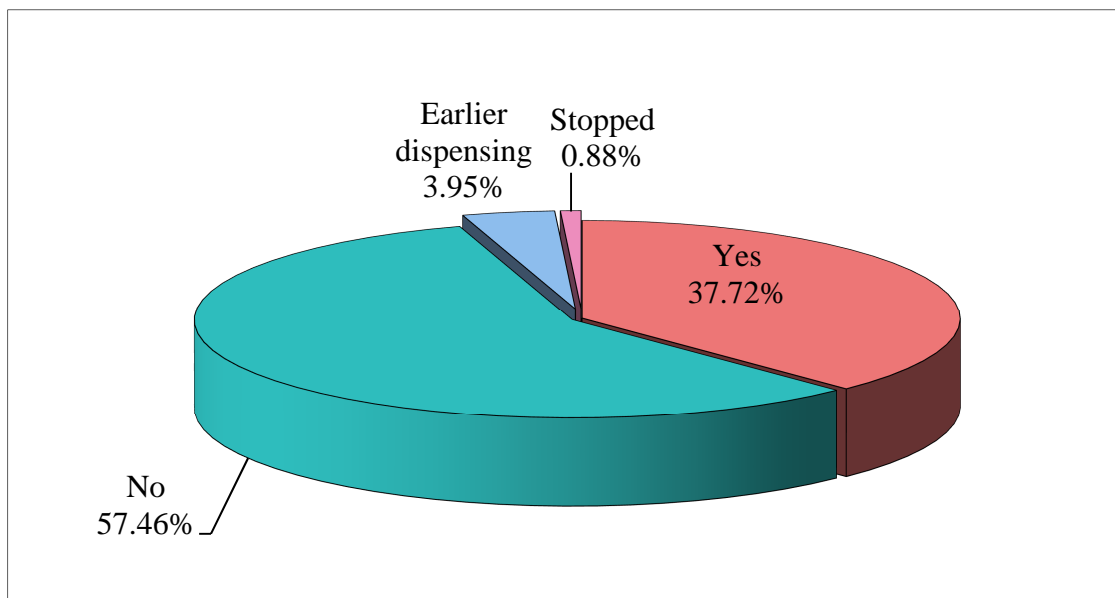
**4.1.5 Distribution of pharmacists based on approach for storing Anti-TB.**

A total of 86 community pharmacies (37.7%) dispensing first-line anti-TB drugs. 9 community pharmacies (3.94%) reported having dispensed anti-TB drugs but stopped because of non-availability of tuberculosis patients and 2 Chain pharmacies (0.88%) had stopped dispensing of Anti-TB drugs and the tuberculosis patients were notified to NTEP.

**Table 9: Distribution of pharmacists based on approach for storing anti –TB drugs.**

Storing of anti-TB drugs	No. of pharmacists	%
Yes	86	37.72
No	131	57.46
Earlier dispensing	9	3.94
Stopped (Chain Pharmacies)	2	0.88
Total	228	100.00

**Figure 10: Graph showing the distribution of pharmacists based on approach for storing anti –TB drugs.**



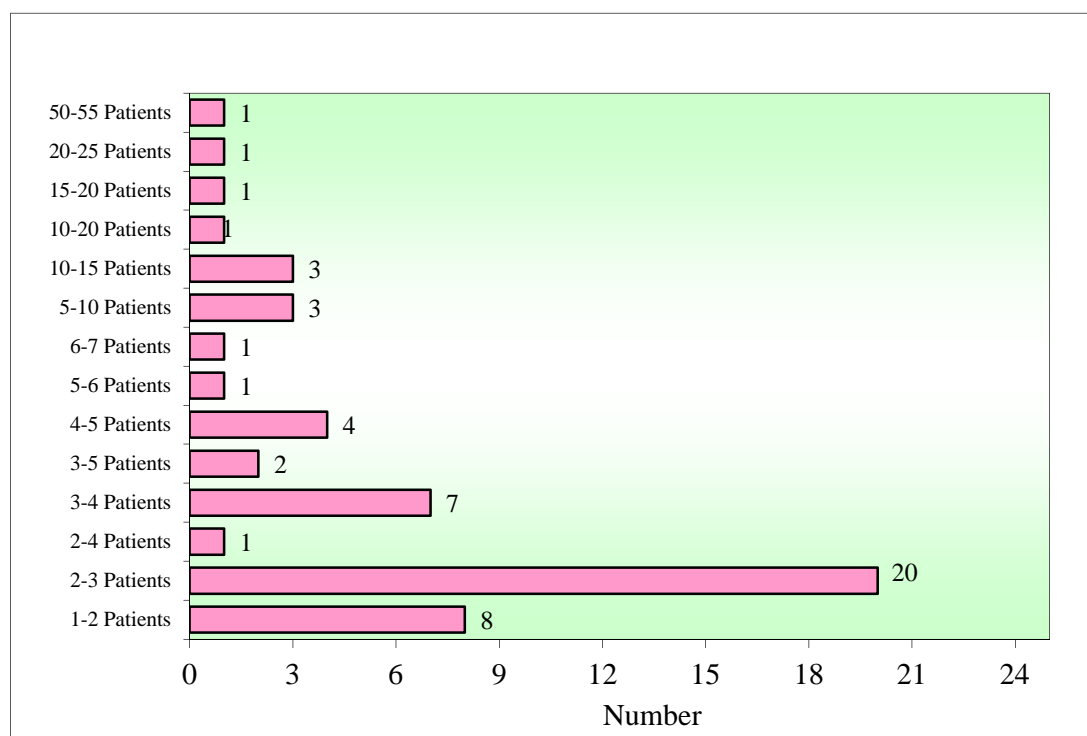
**4.1.6 Number of TB patients expected by community pharmacists to receive anti-TB drugs at pharmacies in a month.**

54 community pharmacies were expecting 136 to 181 tuberculosis patients to purchase Anti-TB drugs in a month (Table 10 and Figure 11). The majority of the community pharmacies (37.04%) were dispensing anti-TB drugs to 2-3 tuberculosis patients monthly. It was observed that 7 community pharmacies (12.96%) dispensing Anti TB drugs 3-4 patients in a month. 8 of the pharmacies (14.81%) dispensing Anti- TB medication to 1-2 patients per month. Following this, 7.41% pharmacies dispensing Anti-TB drugs to 4-5 patients, 5.56% pharmacies received 5-10 patients and 10-15 patients, and 3.7 % community pharmacies dispensing anti-TB drugs to 3-5 patients in a month. Of these, it was observed that 7 community pharmacies (12.96%) were located in proximity to the government civil hospital, which has been estimated to receive 108 to 137 tuberculosis patients seeking Anti-TB drugs monthly.

**Table 10: Number of patients expected by community pharmacists to dispense anti-TB drugs in a month.**

<b>Sl. No</b>	<b>Number of Tuberculosis patients</b>	<b>Number of Community Pharmacies</b>	<b>%</b>
1	1-2 Patients	8	14.81
2	2-3 Patients	20	37.04
3	3-4 Patients	7	12.96
4	3-5 Patients	2	3.70
5	4-5 Patients	4	7.41
6	5-10 Patients	3	5.56
7	10-15 Patients	3	5.56
8	10-20 Patients	1	
9	15-20 Patients	1	
10	20-25 Patients	1	
11	50-55 Patients	1	
12	5-6 Patients	1	
13	6-7 Patients	1	
14	2-4 Patients	1	
<b>Total</b>	<b>136-181 Patients</b>	<b>54</b>	<b>100.00</b>

**Figure 11: Graph showing the number of patients expected by community pharmacists to dispense anti-TB drugs in a month.**



#### **4.1.7 Number of TB patients expected by community pharmacists to avail anti-TB drugs at pharmacies in a week.**

Data on the number of TB patients receiving Anti-TB drugs at community pharmacies per week was collected and consolidated (Table 11). Six community pharmacies were expecting 35-57 tuberculosis patients to purchase anti-TB drugs per week. Of these 2 community pharmacies dispensing Anti-TB drugs (33.33%) received 2 to 3 tuberculosis patients per week (Table 11). Four community pharmacies (66.67%) were dispensing anti-TB drugs, each receiving 3-4 patients, 5-10 patients, 10-20 patients, and 15-20 patients respectively which collectively added up to 33 to 54 tuberculosis patients per week. The remaining 26 community pharmacists did not provide an estimation of number of tuberculosis patients at the time of the interview.

**Table 11: Number of patients expected by community pharmacists to dispense anti-TB drugs in a week.**

Sl. No	Number of Tuberculosis patients	Number of Community Pharmacies*	%
1	2-3 Patients	2	33.33
2	3-4 Patients	1	66.67
3	5-10 Patients	1	
4	10-20 Patients	1	
5	15-20 Patients	1	
Total	35-57 Patients	6	100.00

\*Remaining 26 Community pharmacist did not know the estimating (Tuberculosis patients) of dispensing anti-TB drugs.

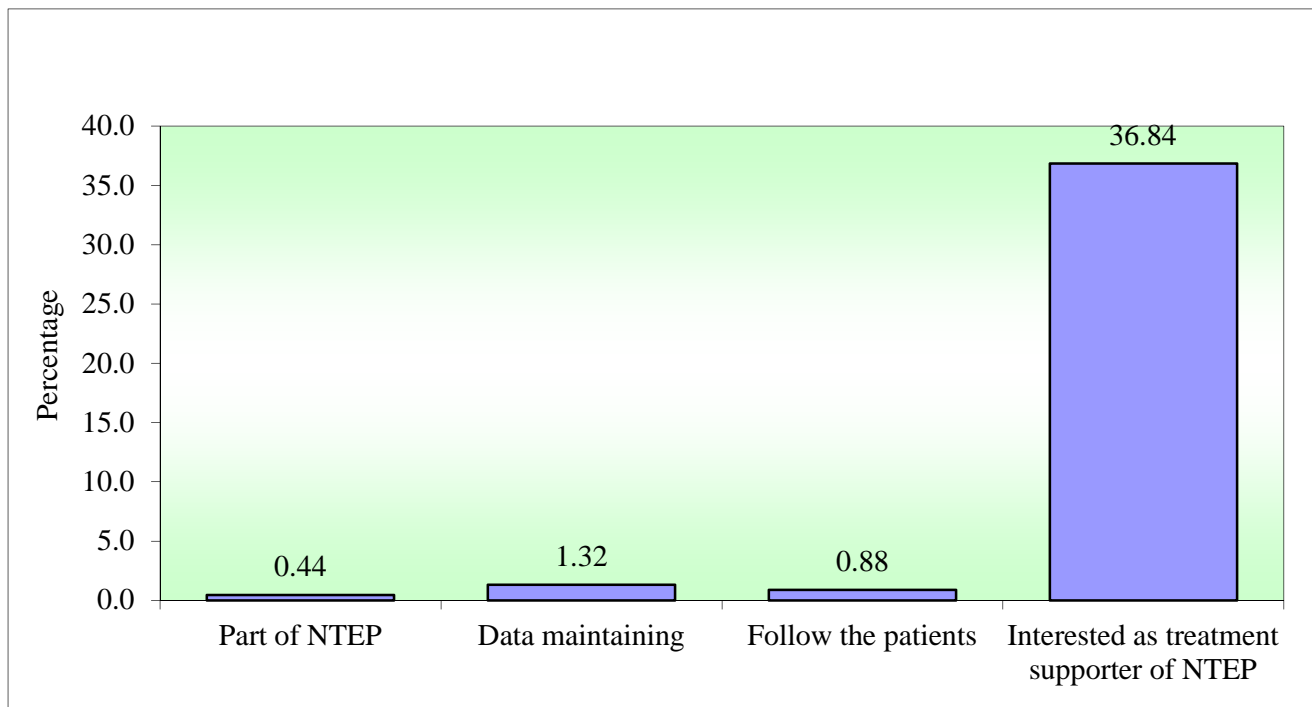
#### **4.1.8 Distribution of community pharmacies partnered with NTEP, data maintaining, patient follow up and interest in being recognized as treatment supporter of NTEP.**

In our study, only one pharmacy out of the 228 interviewed (0.44%) was partnered NTEP and discontinued because of no monitoring by NTEP health care professionals. 3/228 pharmacies (1.32%) maintained data of TB patients while most of the Community pharmacies (225/228) did not maintain any kind of data (98.68%). Similarly, only 2 community pharmacies follow-up of TB patients was took place (226/228; 99.12%) patients receiving anti-TB medications from them. After interviewing and explaining the role of community pharmacists to eradicate TB from India, 84/228 (36.84%) community pharmacies shows interest to be part of treatment supporter of NTEP-DOTS but 144 community pharmacies did not show interest being part of a recognized as treatment supporter of NTEP (Table 12; Figure 12).

**Table 12: Distribution of community pharmacies partnered with NTEP, Data maintaining, patient follow up and interest in being recognized as treatment supporter of NTEP.**

	Number of pharmacies	%
<b>Partnered NTEP</b>		
No	227	99.56
Yes	1	0.44
<b>Data maintaining</b>		
No	225	98.68
Yes	3	1.32
<b>Follow-up on patients</b>		
No	226	99.12
Yes	2	0.88
<b>Interest as Treatment supporter NTEP</b>		
No	144	63.16
Yes	84	36.84
Total	228	100.00

**Figure 12: Graph showing the distribution of community pharmacies Partnered NTEP, data maintaining, patient follow up, and interest as treatment supporter of NTEP.**



**4.1.9 Dispensing pattern of Anti-TB drugs by community pharmacies.**

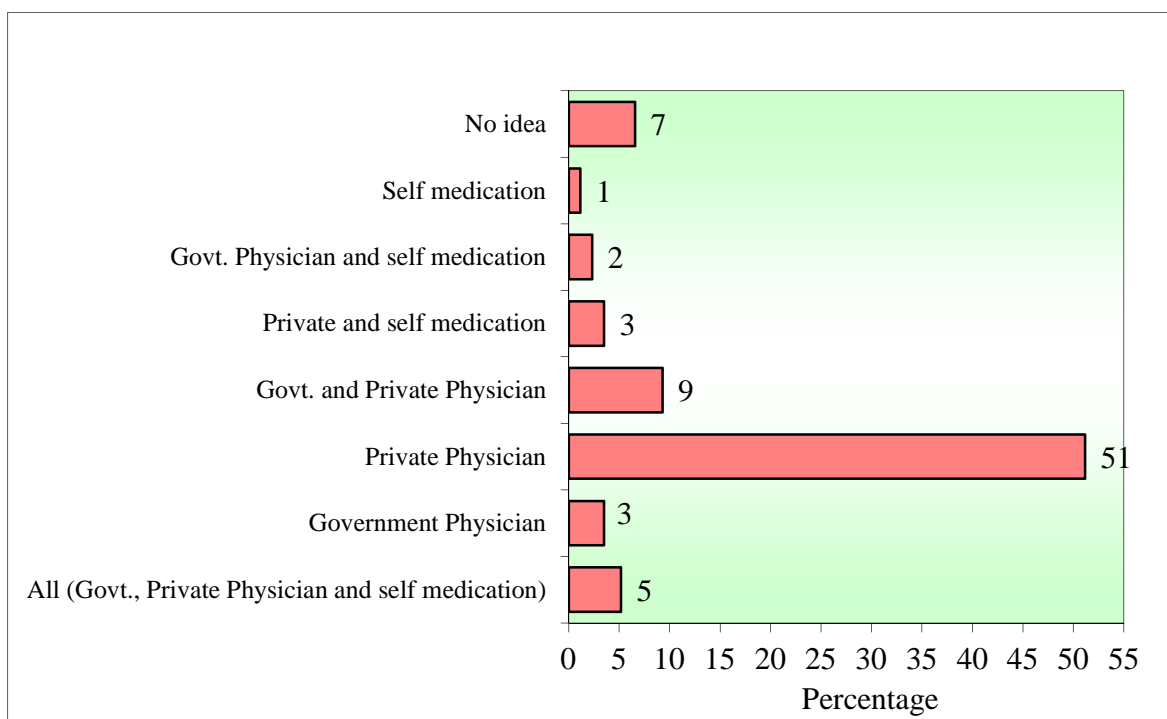
The pattern of dispensing of the Anti-TB drug was studied in 86 pharmacies and an interesting pattern was observed (Table 13 and Figure 13). The majority of the community pharmacies (44/86; 51.16%) dispensing Anti-TB drugs according to prescriptions issued by Private physicians. 5 community pharmacies (5.81%) dispensing Anti-TB drugs based on both prescriptions, either by government physicians, private physicians, or self-medication. 8 Community pharmacies (9.30%) were dispensing Anti-TB drugs as per prescription from both private and government physicians and 3 pharmacies (3.49%) dispensing Anti-TB drugs from government physicians. 3 of 86 community pharmacies (3.49%) dispensing by government physician and self-medication also. Whereas 2 community pharmacies

(2.33%) dispensing by Government physician and self-medication also. Only 1 pharmacy (1.16%) dispensing on self-medication. Remaining 20 community pharmacies (23.26%) had no idea of dispensing pattern of Anti-TB drugs (Table 13).

**Table 13: Dispensing pattern of Anti-TB drugs by community pharmacies.**

<b>Prescription</b>	<b>No. of pharmacies</b>	<b>%</b>
All (Govt., Private Physician and Self medication)	5	5.81
Govt. Physician	3	3.49
Private Physician	44	51.16
Govt. and private Physician	8	9.30
Private Physician and self-medication	3	3.49
Govt. Physician and Self-medication	2	2.33
Self-medication	1	1.16
No idea	20	23.26
Total	86	100.00

**Figure 13: Graph showing the dispensing pattern of Anti-TB drugs by community pharmacies.**



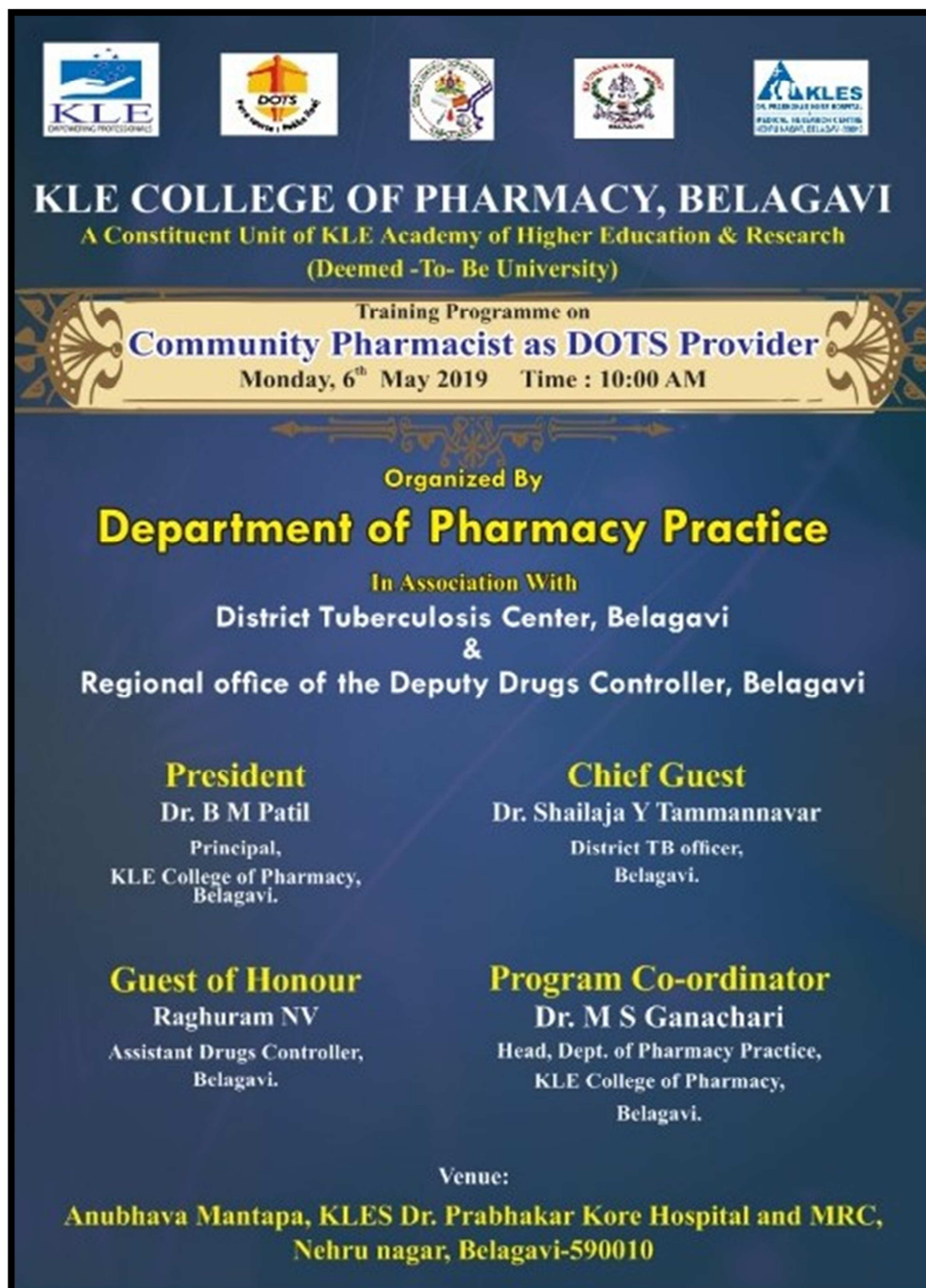
## 4.2 Training

After the initial survey, 60 community pharmacists from various areas were attended the training. As per NTEP Community pharmacist training module are focused and assessed Knowledge, Attitude, and Practice of community pharmacists. Half-day training program includes followings:

1. Global and Indian scenario of Tuberculosis.
2. Basic understanding of Tuberculosis and drug resistance tuberculosis.
3. Understanding NTEP and DOTS Strategy.
4. Tuberculosis patient counseling tips.
5. Referring TB patients to NTEP.

6. Treatment supporter of NTEP.
7. Follow up of TB Patients.
8. Recording and reporting of TB Patients.
9. Incentives provision for community pharmacists.
10. National strategic plan 2017-25 to eradicate TB.
11. Knowledge, Attitude, and Practice of community pharmacists in TB control and care.

4.2.1 The training program was conducted according to our Secondary objectives to train and Certify community pharmacists as a treatment supporter of NTEP.



The poster features five logos at the top: KLE (Karnataka Veterinary, Animal and Fisheries Sciences University), DOTS (Directly Observed Therapy Short-course), the Government of Karnataka emblem, the Government of India emblem, and KLES (Karnataka Veterinary, Animal and Fisheries Sciences University) Belagavi. The main title is 'KLE COLLEGE OF PHARMACY, BELAGAVI', followed by 'A Constituent Unit of KLE Academy of Higher Education & Research (Deemed -To- Be University)'. The program title is 'Training Programme on Community Pharmacist as DOTS Provider' held on 'Monday, 6<sup>th</sup> May 2019' at 'Time : 10:00 AM'. It is organized by the 'Department of Pharmacy Practice' in association with the 'District Tuberculosis Center, Belagavi' and the 'Regional office of the Deputy Drugs Controller, Belagavi'. The President is Dr. B M Patil, Principal of KLE College of Pharmacy, Belagavi. The Chief Guest is Dr. Shailaja Y Tammanavar, District TB officer, Belagavi. The Guest of Honour is Raghuram NV, Assistant Drugs Controller, Belagavi. The Program Co-ordinator is Dr. M S Ganachari, Head, Dept. of Pharmacy Practice, KLE College of Pharmacy, Belagavi. The venue is Anubhava Mantapa, KLES Dr. Prabhakar Kore Hospital and MRC, Nehru nagar, Belagavi-590010.

**KLE**  
KARNATAKA VETERINARY, ANIMAL AND FISHERIES SCIENCES UNIVERSITY

**DOTS**  
DIRECTLY OBSERVED THERAPY SHORT-COURSE

**KLES**  
KARNATAKA VETERINARY, ANIMAL AND FISHERIES SCIENCES UNIVERSITY  
DISTRICT TUBERCULOSIS CENTER  
DOTS BELAGAVI, BELAGAVI-590010

**KLE COLLEGE OF PHARMACY, BELAGAVI**  
A Constituent Unit of KLE Academy of Higher Education & Research  
(Deemed -To- Be University)

Training Programme on  
**Community Pharmacist as DOTS Provider**  
Monday, 6<sup>th</sup> May 2019 Time : 10:00 AM

Organized By  
**Department of Pharmacy Practice**  
In Association With  
District Tuberculosis Center, Belagavi  
&  
Regional office of the Deputy Drugs Controller, Belagavi

**President**  
Dr. B M Patil  
Principal,  
KLE College of Pharmacy,  
Belagavi.

**Chief Guest**  
Dr. Shailaja Y Tammanavar  
District TB officer,  
Belagavi.

**Guest of Honour**  
Raghuram NV  
Assistant Drugs Controller,  
Belagavi.

**Program Co-ordinator**  
Dr. M S Ganachari  
Head, Dept. of Pharmacy Practice,  
KLE College of Pharmacy,  
Belagavi.

Venue:  
**Anubhava Mantapa, KLES Dr. Prabhakar Kore Hospital and MRC,  
Nehru nagar, Belagavi-590010**

#### **4.2.2 Training program details:**

The training program was sponsored by District TB center, Belagavi. Department of Pharmacy Practice, KLE College of pharmacy college, Belagavi conducted a Training program on “**Community Pharmacist as DOTS Provider**” in Association with District Tuberculosis Center, Belagavi, and Regional office of the Deputy Drugs controller, Belagavi. 60 Community pharmacists from Belagavi city have participated. As a research scholar, **Dr. Uday Kumar R** presented survey data in front of the Resource person and attended community pharmacists. Research Guide **Dr. M S Ganachari, Professor and Head**, Department of Pharmacy Practice overviewed the Research work.

**Chief Guest Dr. Shailaja Tammannavar**, District Tuberculosis officer, Belagavi had Addressed the training program. Training of community pharmacists includes emphasized on new guidelines for developed for detection and financial support from state and central Government. The burden of tuberculosis in India, There is a huge role in community pharmacists for eradication TB from India. Lectured on Incentives for community pharmacists and can also become treatment support from NTEP. Importance of community pharmacists involving in PPM (Public-private partnership) to eradicate TB from India.

**Deepak N Gaikwad, Deputy Drug Controller**, Regional office of the Deputy Drugs Controller, Belagavi. Lectured on Community pharmacists should be strengthened to fulfill the vision of NTEP to eradicate TB from India. He assured and permitted Community pharmacists for treatment support of NTEP for the convenience of tuberculosis patients and to increase the adherence of Anti-tuberculosis drugs. He also addressed community pharmacists must be united to

eradicate TB. He also delivered a lecture on Schedule H and Schedule H1 and the documentation process of Anti-TB drugs.

**Raghuram NY, Assistant Drug Controller**, Regional office of the Deputy Drugs Controller, Belagavi, Addressed that emphasized on MDR-TB and steps to be taken to prevent and eradicate TB and also lectured on permission required to become treatment supporter of NTEP.

**Dr. Karadiguddi, Retired District TB officer [DTO]** also shared his experience on tuberculosis control and care in India. Certificates have been issued to community pharmacists and students from KLE College of Pharmacy, Belagavi also attended the training Program.

4.2.3 Inauguration of training



**4.2.4 Prof. (Dr.) M S Ganachari, Head, Department of Pharmacy Practice, KLE College of Pharmacy, overviewed the training program.**



**4.2.5 Being a research scholar presented Survey Data in front of Resource persons.**



**4.2.6 Dr. Shailaja Tammannavar**, District TB Control officer, Delivered training as per Community pharmacist NTEP training module.



**4.2.7 Deepak N Gaikwad**, Deputy Drug Controller, Delivered training on Schedule H and Schedule H1 and documentation process of Anti-TB drugs.



**4.2.8 Raghuram NY**, Assistant Drug controller, delivered a lecture on permission required to become treatment supporter of NTEP-DOTS.



**4.2.9 Dr. Karadiguddi**, Retired District TB control officer, Shred his experience on TB prevention and care in India.



4.2.10 Participant's group photo



4.2.11 News Pater Cuttings: Prajavani Newspaper and Deccan Herald Newspaper.

## ಕೆಎಲ್‌ಇ ಫಾರ್ಮಸಿ ಕಾಲೇಜಿನಲ್ಲಿ ತರಬೇತಿ ಕಾರ್ಯಾಗಾರ ಸಂಪನ್ನ

■ ವಿಕ ಸುದ್ದಿಯೋಕ ಬೆಳಗಾವಿ

ಕೆಎಲ್‌ಇ ಫಾರ್ಮಸಿ ಕಾಲೇಜಿನಲ್ಲಿ ವಿವಿಧ ಇಲಾಖೆಗಳ ಸಹಯೋಗದಲ್ಲಿ 'ಕಮ್ಯುನಿಟಿ ಫಾರ್ಮಾಸಿಸ್ಟ್ ಆಫ್ ಡಿಪಿಟಿಎಸ್ ಪ್ರೊವೈಡರ್' ಎನ್ನುವ ತರಬೇತಿ ಕಾರ್ಯಾಗಾರ ನಡೆಯಿತು. ಜಿಲ್ಲಾ ಕ್ಷಯರೋಗ ನಿಯಂತ್ರಣ ಅಧಿಕಾರಿ ಡಾ. ಶೈಲಜಾ ತಮ್ಮಣ್ಣವರ ಮುಖ್ಯ

ಅತಿಥಿಯಾಗಿ ಪಾಲ್ಗೊಂಡಿದ್ದರು. ಕಾಲೇಜಿನ ಪ್ರಾಚಾರ್ಯ ಡಾ. ಬಿ.ಎಂ. ಪಾಟೀಲ್ ಅಧ್ಯಕ್ಷತೆ ವಹಿಸಿದ್ದರು. ಡೆಪ್ಯೂಟಿ ಡ್ರಗ್ ಕಂಟ್ರೋಲ್ ಅಧಿಕಾರಿ ದೀಪಕ ಎನ್. ಗಾಯಕವಾಡ, ಸಹಾಯಕ ಡ್ರಗ್ ಕಂಟ್ರೋಲ್ ಅಧಿಕಾರಿ ರಘುರಾಮ್ ಎನ್.ವೈ, ಡಾ. ಎಂ.ಎಸ್. ಗಣಾಚಾರಿ, ಡಾ. ಕರಡಿಗುದ್ದಿ ಇದ್ದರು.



ಬೆಳಗಾವಿಯ ಕೆಎಲ್‌ಇ ಫಾರ್ಮಸಿ ಕಾಲೇಜಿನಲ್ಲಿ ತರಬೇತಿ ಕಾರ್ಯಾಗಾರ ನಡೆಯಿತು.

## Greater role seen for community pharmacists in fighting TB

SPECIAL CORRESPONDENT BELAGAVI

KLE College of pharmacy organised a training programme on "Community Pharmacist as DOTS Provider" in association with the District Tuberculosis Centre and the regional office of the Deputy Drugs Controller in Belagavi on Wednesday. Community pharmacists, druggists, retailers and chemists from Belagavi and surrounding areas participated.

Shailaja Tammanavar, District TB Control Officer, spoke on the new guidelines developed for detection of TB and financial support from the governments. She said that there was a greater role for community pharmacists in the eradication of diseases such as TB.

Raghuram N.Y., Assistant Drug Controller, emphasised on the steps to be taken to prevent and eradicate TB. Deepak N. Gaikwad, Deputy Drug Controller, asked community pharmacists to work unitedly to eradicate TB.

College principal B.M. Patil, Head of Department M.S. Ganachari and others were present.

4.2.12 Published in News Bulletin Library: A weekly publication from ICMR-NIRT Library. Year: 2019, volume:2, Issue No.: 19.

NEWS BULLETIN



THE HINDU

**Greater role seen for community pharmacists in fighting TB**

BELAGAVI, MAY 09

KLE College of pharmacy organised a training programme on "Community Pharmacist as DOTS Provider "in association with the District Tuberculosis Centre and the regional office of the Deputy Drugs Controller in Belagavi on Wednesday. Community pharmacists, druggists, retailers and chemists from Belagavi and surrounding areas participated.

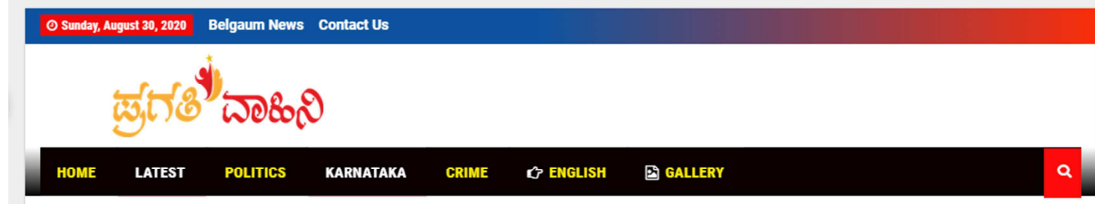
Shailaja Tammanavar, District TB Control Officer, spoke on the new guidelines developed for detection of TB and financial support from the governments. She said that there was a greater role for community pharmacists in the eradication of diseases such as TB.

Raghuram N.Y., Assistant Drug Controller, emphasised on the steps to be taken to prevent and eradicate TB. Deepak N. Gaikwad, Deputy Drug Controller, asked community pharmacists to work unitedly to eradicate TB.

College principal B.M. Patil, Head of Department M.S. Ganachari and others were present.

#### 4.2.13 Local news channel: Pragativahini

<https://pragativahini.com/author/pragativahini/>



## Community Pharmacist As DOTS Provider -Training Program

By Pragativahini — On May 8, 2019

Pragativahini News, Belagavi

Department of Pharmacy, KLE College of pharmacy college, Belagavi conducted a Training program on “Community Pharmacist as DOTS Provider” in Association with District Tuberculosis centre, Belagavi and Regional office of the Deputy Drugs controller, Belagavi.

Community pharmacist, Druggist, Retailer, Chemist from Belagavi city are participated. Before training program preliminary survey had took in community pharmacy across Belagavi city for aware of tuberculosis.

Chief Guest, District Tuberculosis control officer Dr. Shailaja Tammanavar has Given a training to community pharmacist on emphasized on new guidelines for developed for detection and financial support from state and central Government. Burden of tuberculosis in India, There is a huge role on community pharmacist for eradication TB. Incentives for community pharmacist and community pharmacist can do the treatment support from RNTCP Drugs.

Guest of Honor Deputy Drug controller Deepak N Gaikwad has given a speech, Role of community pharmacist should be strengthened to fulfill the vision of RNTCP Program to eradicate TB from India. We will give the permission for treatment support from RNTCP Drugs to increase the adherence. He also addressed community pharmacist must be united to eradicate TB

Assistant Drug controller Raghuram NY, Addressed that emphasized on MDR-TB and steps to be taken to prevent and eradicate TB. He also addressed community pharmacist must be united to eradicate TB. He assured that Drug controller Dept. will assure to become community pharmacist as treatment supporter of RNTCP Drugs.

Program Co-ordinator, HoD Dept. of Pharmacy Practice Dr. M S Ganachari Addressed the survey report of Anti-Tuberculosis drugs across the Belagavi city. Efforts should be made to fulfill the gap between private sector and government sector.

Principal, KLE College of Pharmacy Dr. BM Patil, had given presidential remarks.

Dr. Karadiguddi, Retired DTO also shared the stage and addressed. Around 60 community pharmacist are attended the training program and students KLE college of Pharmacy also participated in the training.

## 4.2.14 APTI BULLETIN: Vol. 20, Issue 119, May - June 2019

9



Department of Pharmacy Practice, KLE College of pharmacy college, Belagavi conducted a Training programme on "**Community Pharmacist as DOTS Provider**" in Association with District Tuberculosis centre, Belagavi and Regional office of the Deputy Drugs controller, Belagavi. Community pharmacist, Druggist, Retailer, Chemist from Belagavi city are participated. Before training programme 350 Druggists, Retailers, Chemists were preliminarily surveyed across Belagavi city for awareness of tuberculosis burden in India. The preliminary survey of data includes availability, non availability of Anti-Tuberculosis drugs, dispensing pattern of Anti-tuberculosis drugs, Community pharmacist who are interested to become treatment supporter of RNTCP-DOTS.

Wellcome Address by Dr. Uday kumar R, Ph.D Research. Introduction

of guest, aim of training programme and presentation of project work of survey data those community pharmacist willingness to become treatment supporter of RNTCP-DOTS. Inauguration and followed by Dr. BM Patil, Princiapal, KLE College of Pharmacy, Belagavi had given presidential remarks on importance of training programme to eradication of tuberculosis from India. Chief Guest Dr. Shailaja Tammanavar, District Tuberculosis control officer, Belagavi had Addressed the training programme and followed by training. Training of community pharmacist includes on emphasized on new guidelines for developed for detection and financial support from state and central Government. Burden of tuberculosis in India, There is a huge role on community pharmacist for eradication TB. Incentives for community pharmacist and can also become treatment support from RNTCP Drugs. Importance community pharmacist involving in PPM (Public private partnership) to eradicate TB from India. Deepak N Gaikwad, Deputy Drug controller, Regional office of the Deputy Drugs Controller, Belagavi. had given a speech on Community pharmacist should be strengthened to fulfill the vision of RNTCP Programme to eradicate TB from India. We will give the permission for treatment support for RNTCP Drugs to store in community pharmacies for convenient of tuberculosis patients and to increase the adherence of Anti-tuberculosis drugs. He also addressed community pharmacist must be united to eradicate TB. Raghuram NY, Assistant Drug controller, Regional office of the Deputy Drugs Controller, Belagavi. Addressed that emphasized on MDR-TB and steps to be taken to prevent and eradicate TB. He also addressed community pharmacist must be united to eradicate TB. He assured that Drug controller Department will assure to become community pharmacist as treatment supporter of RNTCP Drugs. Dr. Karadiguddi, Retired DTO also shared his experience on tuberculosis control and care in India. 100 community pharmacist are attended the training programme including students of KLE college of Pharmacy also participated in the training Programme.

\*\*\*\*\*

#### **4.2.15 Demographic profile of pharmacists enrolled in the training program for this study.**

The demographic profile of 60 community pharmacists enrolled in the training program for this study has been given in Table 14. As seen from the table, 58 of the 60 participants (96.67) were males and only 2 female pharmacists (3.33%) enrolled for the study. 95% of the community pharmacists participating in the study were D. Pharm holders, with the rest 3 having B. Pharm degree (5%). There were no M. Pharm degrees holding Community pharmacists in the training group. The majority of the community pharmacists were within the age group of 40-49 years (31.67%), followed by the age group of 30-39 years (28.33%). Thus Community pharmacists within the age group of 30-50 years made up of almost 60% of the training group participants. Community Pharmacists beyond the age of 50, 11 in numbers, which is the least number of participants (18.33%). 21.67% of the total participating community pharmacists were less than 29 years of age. Data on total years of experience was also collected and tabulated in Table 15. The experience of most of the community pharmacists (40%) was in the range of 11-20 years. Relatively lower experienced pharmacists with 1-10 years of experience made up 35% of the participant number. Community Pharmacists with an experience of more than 21 years (25%) were the lowest in number.

**Table 14: Demographic profile of pharmacists enrolled in the training program for this study.**

<b>Demographic profile</b>	<b>No of pharmacists</b>	<b>% of pharmacists</b>
<b>Gender</b>		
Male	58	96.67
Female	2	3.33
<b>Education</b>		
B. Pharm.	3	5.00
D. Pharm.	57	95.00
<b>Age groups</b>		
<=29yrs	13	21.67
30-39yrs	17	28.33
40-49yrs	19	31.67
>=50yrs	11	18.33
<b>Experiences</b>		
1-10yrs	21	35.00
11-20yrs	24	40.00
>=21yrs	15	25.00
Total	60	100.00

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**4.2.16 Comparison of baseline, 3<sup>rd</sup> month and 6<sup>th</sup> month in each item of the questionnaire related to knowledge by Cochran's Q Test.**

Cochran's Q test was employed to analyse the data collected via a developed questionnaire about knowledge of the community pharmacists enrolled in the study and comparison of the enhancement on knowledge at baseline, 3<sup>rd</sup> month, and 6<sup>th</sup> month of the training program. The first part of the questionnaire collected data regarding demographics and the second part had 25 questions of information regarding, the spread of TB infection, TB symptoms, and certain aspects of government run Anti TB programs such as NTEP and DOTS. The results were estimated from baseline data and analyzed with a p-value between 0.001-0.22.

At baseline, between 85%-90% of the Community pharmacists had accurate knowledge regarding the spread from person to person by coughing. 80-85% of the community pharmacists knew about the effectiveness of NTEP, the use of N-95 masks for control of TB spread, and airborne transmission of TB. Between 70-75% of Community pharmacists were knowledgeable about the transmission of TB and the correct use of the N-95 mask along with the prevalence of TB in Belagavi district. Regarding a family member being a DOTS provider, only 63% of the community pharmacists answered correctly. However, only 50%-60% of the Community pharmacists provided accurate answers to questions about modes of transmission of TB and multi-drug resistant TB. Only 46% of the community pharmacists had correct knowledge about sexual transmission of TB, which is negative, which indicates that most of the community pharmacists, before training, believed that TB is spread by sexual means. Similarly, 33.3% of the participants were aware that TB is not spread by talking. Lastly, more than 80% of the

community pharmacists had inaccurate knowledge regarding the use of surgical masks for TB prevention.

In the 3<sup>rd</sup> month of training, it was observed that more than 96% of the participants provided correct answers, indicating significant improvement in knowledge. 93.3% of the community pharmacists provided an accurate response for query regarding use for masks for TB prevention as compared to 70% at baseline. Also, significant improvement was marked in case of questions related to TB transmission as 91% of participants answered accurately to those questions as compared to baseline. Only 5 had acquired knowledge regarding correct usage of N 95 masks hence not much improvement was seen at the 3<sup>rd</sup>-month evaluation for that particular item in the questionnaire.

At the 6<sup>th</sup> month review, more than 98% of the community pharmacists were able to provide correct responses to all the questions. The same was reflected in the Cochran's Q test values where a large value was noted for item no. 7 which indicated a higher difference between learning at baseline as compared to that at 6 months (Table 15). The p-values were most at 0.001 indicating that the data was statistically significant.

**Table 15: Comparison of baseline, 3<sup>rd</sup> month and 6<sup>th</sup> month in each item of a questionnaire related to knowledge by Cochran's Q Test.**

Questions	Correct Knowledge at						Cochran's Q Test	P-value
	Baseline	%	3 months	%	6months	%		
Q1	50	83.33	58	96.67	60	100.00	16.8000	<0.001
Q2	57	95.00	59	98.33	60	100.00	4.6666	0.0969
Q3	52	86.67	60	100.00	60	100.00	16.0000	<0.001
Q4	54	90.00	59	98.33	60	100.00	10.3333	0.0057*
Q5	57	95.00	59	98.33	60	100.00	4.6666	0.0969
Q6	48	80.00	59	98.33	60	100.00	22.1666	<0.001
Q7	58	96.67	59	98.33	60	100.00	3.0000	0.2231
Q8	42	70.00	58	96.67	60	100.00	32.4444	<0.001
Q9	45	75.00	58	96.67	60	100.00	26.5333	<0.001
Q10	52	86.67	55	91.67	60	100.00	8.9090	0.0116*
Q11	38	63.33	58	96.67	59	98.33	38.2727	<0.001
Q12	28	46.67	55	91.67	60	100.00	53.8787	<0.001
Q13	46	76.67	60	100.00	60	100.00	28.0000	<0.001
Q14	31	51.67	55	91.67	59	98.33	40.4705	<0.001
Q15	52	86.67	59	98.33	60	100.00	12.6666	0.0018*
Q16	52	86.67	59	98.33	60	100.00	12.6666	0.0018*

Q17	30	50.00	55	91.67	59	98.33	53.8787	<0.001
Q18	35	58.33	59	98.33	60	100.00	8.0800	<0.001
Q19	20	33.33	59	98.33	60	100.00	78.0500	<0.001
Q20	49	81.67	58	96.67	60	100.00	17.1667	<0.001
Q21	7	11.67	55	91.67	59	98.33	96.6154	<0.001
Q22	42	70.00	47	78.33	59	98.33	22.9000	<0.001
Q23	45	75.00	56	93.33	59	98.33	23.2857	<0.001
Q24	42	70.00	58	96.67	60	100.00	32.4444	<0.001
Q25	33	55.00	58	96.67	60	100.00	32.4444	<0.001

\*p<0.05

#### **4.2.17 Comparison of baseline, 3<sup>rd</sup> month and 6<sup>th</sup> month in each item related to a questionnaire related to attitude and practice towards TB infection by Cochran's Q Test.**

Community pharmacists participating in the training program were also evaluated based on their attitudes and practices towards TB infection and control. The topics like patient therapy, public-private combination, TB care, application, and use of government mandated like DOTS and NIKSHAY app. Responses to the 14 questions in the questionnaire were collected at baseline and after the 3<sup>rd</sup> month and 6<sup>th</sup> month of training as described in the previous section.

Table 16 presents the data on the evaluation of Community pharmacists for their attitude and practice towards TB infection and control. At baseline, many of the community pharmacists were unable to provide accurate answers to most of the

questions, indicating that there were gaps in the attitude and practice of the community pharmacist towards TB. 81%-83% Community pharmacists provided accurate answers to questions relevant to patient data collection and maintenance of records. 55%-73% of participants were aware of initiatives provided by NTEP for Community pharmacists referring to TB patients or the provisions NTEP had for including Community pharmacies as treatment supporter of NTEP. Only 28 (46.66%) of the 60 participants were aware of the NIKSHAY app and 22 (36.67%) of the 60 were aware of the Public-Private Mix (PPM) for Tuberculosis control and care. None of the 60 community pharmacists (0%) had received training from the NTEP.

Significant improvement in attitude and practice was observed after 3<sup>rd</sup> month from baseline. 100% of the Community pharmacists provided accurate responses to 8 out of the 14 questions in the list about NTEP initiatives and dispensing of TB medications. Further improvement in attitude and practice was observed after 6 months of training as 100% of the participants were able to respond to 11 out of the 14 questions. The rest of the questions had responses of more than 98% of the community pharmacists indicating an improvement in attitude and practice after training.

**Table 16: Comparison of baseline, 3<sup>rd</sup> month and 6<sup>th</sup> month in each item related to a questionnaire related to attitude and practice toward TB infection and control by Cochran's Q Test.**

Questions	Baseline	%	3 months	%	6 months	%	Cochran's Q Test	P-value
Q1	54	90.00	58	96.67	60	100.00	9.3333	0.0094*
Q2	50	83.33	59	98.33	60	100.00	8.2000	<0.001
Q3	54	90.00	60	100.00	60	100.00	12.0000	0.0024*
Q4	49	81.67	60	100.00	60	100.00	22.0000	<0.001
Q5	49	81.67	60	100.00	60	100.00	22.0000	<0.001
Q6	44	73.33	60	100.00	60	100.00	32.0000	<0.001
Q7	0	0.00	60	100.00	60	100.00	120.0000	<0.001
Q8	22	36.67	60	100.00	60	100.00	76.0000	<0.001
Q9	39	65.00	60	100.00	60	100.00	42.0000	<0.001
Q10	33	55.00	59	98.33	60	100.00	52.0740	<0.001
Q11	33	55.00	59	98.33	59	98.33	52.0740	<0.001
Q12	34	56.67	58	96.67	59	98.33	46.2307	<0.001
Q13	28	46.67	60	100.00	60	100.00	64.0000	<0.001
Q14	34	56.67	57	95.00	58	96.67	46.2307	<0.001

\*p<0.05

**4.2.18 Comparison of baseline, 3<sup>rd</sup> month and 6<sup>th</sup> month on each item on Attitudes and Practice on National Strategic Plan (2017-25) by Cochran's Q Test.**

A 4 question questionnaire was used to collect data regarding Attitudes and Practice on National Strategic Plan by Cochran's Q test and the results are given in Table 17. It was observed that at baseline, of the 60 community pharmacists enrolled in training the number of participants who could respond to Q1, Q2, Q3, and Q4 were 9, 16, 32, and 28 respectively, indicating low awareness about NSP by community pharmacists. In all cases, the number of participants responding increased to 56, 57, 58, 58 after 3<sup>rd</sup> month and to 58, 60, 60, 59 after 6<sup>th</sup> month respectively. This increase in scores for attitude and practice is also reflected in Cochran's Q Test scores where larger values are noted which indicates greater improvements.

**Table 17: Comparison of baseline, 3<sup>rd</sup> month and 6<sup>th</sup> month in each item Attitudes and Practice on National Strategic Plan (2017-25) by Cochran's Q Test.**

Questions	Baseline	%	3 months	%	6 months	%	Cochran's Q Test	P-value
Q1	9	15.00	56	93.33	58	96.67	94.1632	<0.001
Q2	16	26.67	57	95.00	60	100.00	80.5777	<0.001
Q3	32	53.33	58	96.67	60	100.00	50.4827	<0.001
Q4	28	46.67	58	96.67	59	98.33	56.4242	<0.001

\*p<0.05

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**4.2.19 Comparison of baseline, 3<sup>rd</sup> month and 6<sup>th</sup> month time points with knowledge, attitude and practice scores towards TB infection control by dependent t-test.**

The dependent t-test (called the paired-samples t-test in SPSS Statistics) compares the means between two related groups on the same continuous, dependent variable. In our study, a paired t-test was run on the on knowledge, attitude and practice data collected from questionnaires from 60 community pharmacists to determine whether there was a statistically significant mean difference between baseline data Vs. data obtained at 3<sup>rd</sup> month and 6<sup>th</sup> month. Also data obtained at 3<sup>rd</sup> month compared with data obtained at 6<sup>th</sup> month.

**4.2.20 Comparison of baseline, 3<sup>rd</sup> month and 6<sup>th</sup> month time points with knowledge scores towards TB infection control by dependent t-test.**

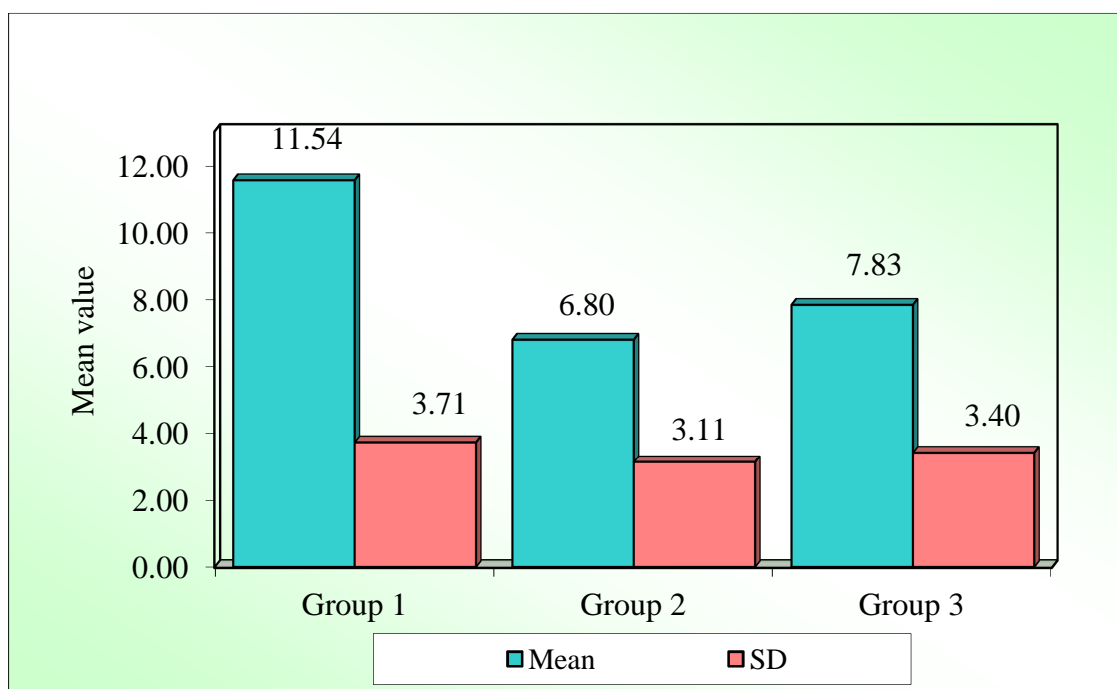
The results for the comparison of knowledge score for various data points have been given in Table 18 and Figure 14. Community pharmacists scored better after 3 months of training on the knowledge aspect of TB ( $23.92 \pm 1.28$ ) as opposed to the baseline scores ( $17.75 \pm 3.49$ ); a statistically significant increase of  $-6.17 \pm 2.92$ ,  $t = 16.3703$ ,  $p < 0.001$ . This accounted for 34.74% enhancement of knowledge within the group. Between baseline data ( $17.75 \pm 3.49$ ) and data collected after 6<sup>th</sup> month post training ( $24.90 \pm 0.30$ ) the mean difference was noted to be  $-7.15 \pm 3.47$  which was statistically significant at  $t = 15.9693$ ,  $p < 0.001$ . The % enhancement in knowledge was calculated to be 40.28%, which is higher as compared to the % increase between baseline and 3<sup>rd</sup>-month scores. There was just marginal improvement between scores of 3<sup>rd</sup> month ( $23.92 \pm 1.28$ ) and 6<sup>th</sup> month ( $24.90 \pm 0.30$ ) which was calculated to be 4.1% increase at  $t = -5.9409$ ,  $p < 0.001$ . This shows that the

maximum effect of training impact on knowledge was seen in the 3<sup>rd</sup> month of the study.

**Table 18: Comparison of baseline, 3<sup>rd</sup> month and 6<sup>th</sup> month time points with knowledge scores towards TB infection control by dependent t-test.**

Timepoints	Mean	Std.Dv.	Mean Diff.	SD Diff.	% of change	Paired t	p-value
Baseline	17.75	3.49					
3 months	23.92	1.28	-6.17	2.92	-34.74	-16.3703	<0.001
Baseline	17.75	3.49					
6 months	24.90	0.30	-7.15	3.47	-40.28	-15.9693	<0.001
3 months	23.92	1.28					
6 months	24.90	0.30	-0.98	1.28	-4.11	-5.9409	<0.001

**Figure 14: Comparison of baseline, 3<sup>rd</sup> month and 6<sup>th</sup> month time points with knowledge scores towards TB infection control by dependent t-test.**



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**4.2.21 Comparison of baseline, 3<sup>rd</sup> month and 6<sup>th</sup> month time points with Attitude and Practice scores towards TB infection control by dependent t-test.**

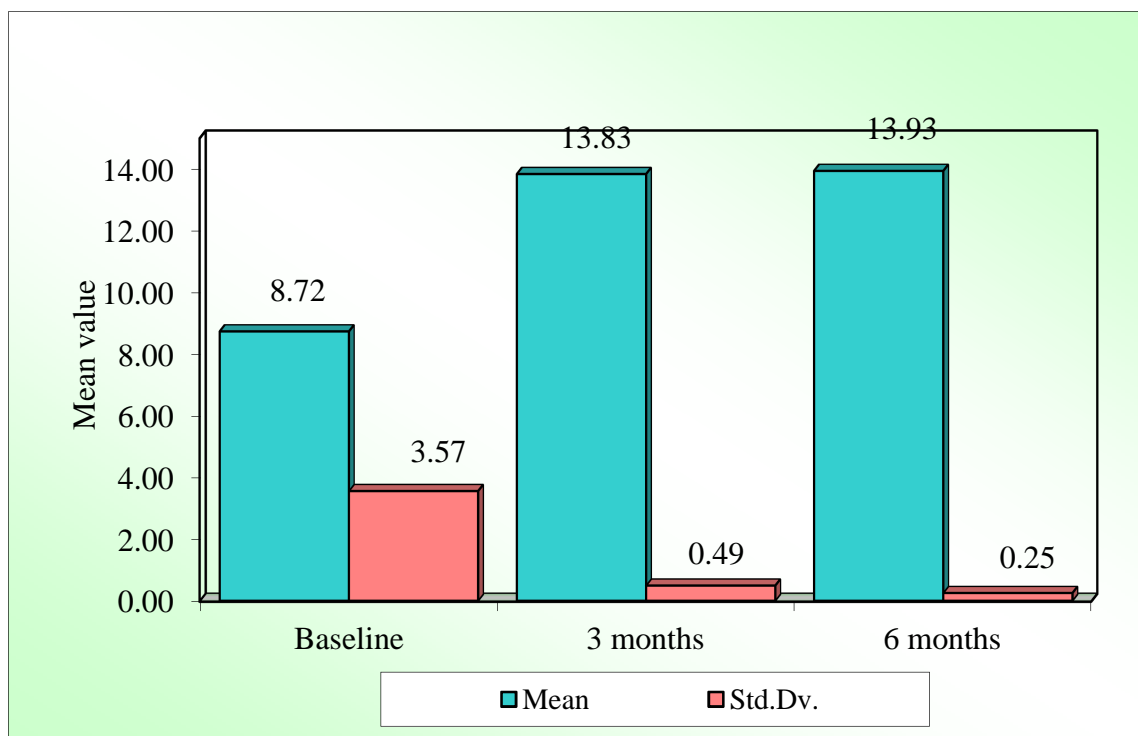
The results for the comparison of Attitude and Practice score for various data points have been given in Table 19 and Figure 15. Community Pharmacists scored better after 3<sup>rd</sup> month of training on the attitude and practice of TB ( $13.83 \pm 0.49$ ) as opposed to the baseline scores ( $8.72 \pm 3.57$ ); a statistically significant increase of  $-5.12 \pm 3.48$ ,  $t = -11.3737$ ,  $p < 0.001$ . This accounted for 58.70% enhancement of Attitude and Practice within the group. Between baseline data ( $8.72 \pm 3.57$ ) and data collected after 6<sup>th</sup> month post-training ( $13.93 \pm 0.25$ ) the mean difference was noted to be  $-5.22 \pm 3.56$  which was statistically significant at  $t = -11.3634$ ,  $p < 0.001$ . The % enhancement was calculated to be 59.85%, which is marginally higher as compared to the % increase between baseline and 3<sup>rd</sup> month scores. There was insignificant improvement between scores of 3<sup>rd</sup> month ( $13.83 \pm 0.49$ ) and 6<sup>th</sup> month ( $13.93 \pm 0.25$ ) which was calculated to be 0.72% increase at  $t = -2.1872$ ,  $p < 0.0327$ , which was statistically significant since  $p < 0.05$ . This shows that the maximum effect of training on Attitude and Practice was seen within 3<sup>rd</sup> month of conducting training and there was no further enhancement from 3<sup>rd</sup> month to 6<sup>th</sup> month since most of the community pharmacists had been equipped with the correct Attitude and Practice towards TB infection and control.

**Table 19: Comparison of baseline, 3<sup>rd</sup> month and 6<sup>th</sup> month time points with attitude and practice scores towards TB infection control by dependent t-test.**

Timepoints	Mean	Std.Dv.	Mean Diff.	SD Diff.	% of change	Paired t	p-value
Baseline	8.72	3.57					
3 months	13.83	0.49	-5.12	3.48	-58.70	-11.3757	<0.001
Baseline	8.72	3.57					
6 months	13.93	0.25	-5.22	3.56	-59.85	-11.3624	<0.001
3 months	13.83	0.49					
6 months	13.93	0.25	-0.10	0.35	-0.72	-2.1872	0.0327*

\*p<0.05

**Figure 15: Comparison of baseline, 3<sup>rd</sup> month and 6<sup>th</sup> month time points with attitude and practice scores towards TB infection control by dependent t-test**



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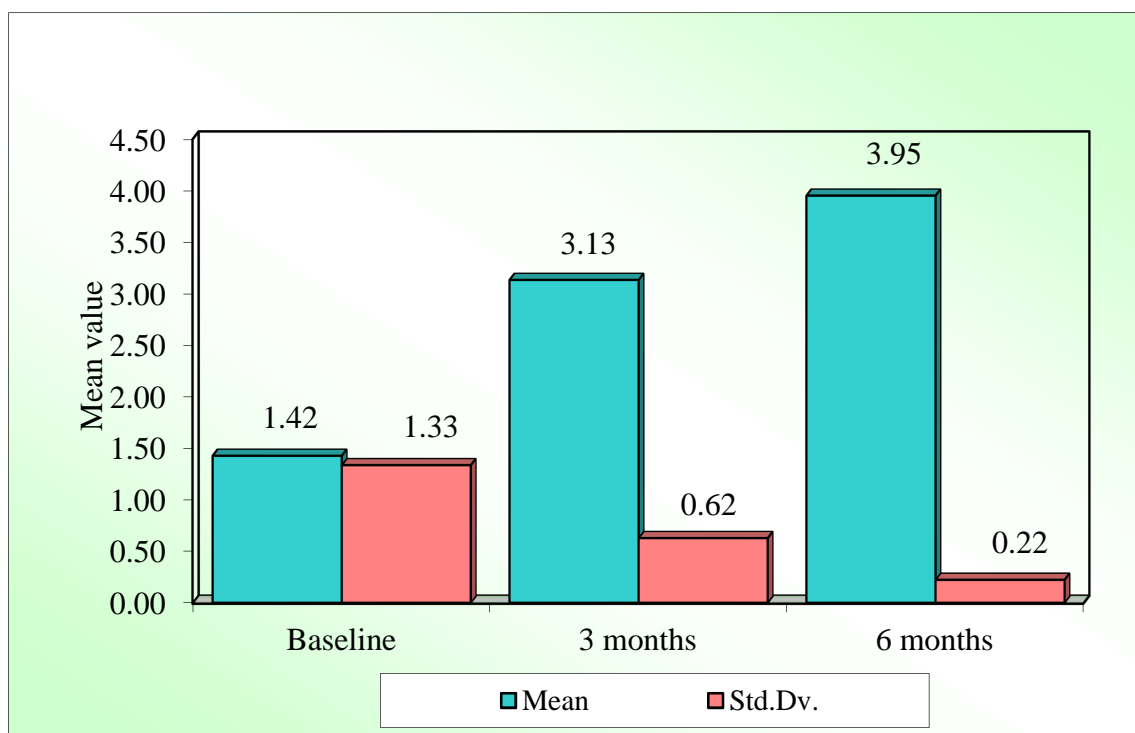
**4.2.22 Comparison of baseline, 3<sup>rd</sup> month and 6<sup>th</sup> month time points with Attitude and Practice scores towards a national strategic plan (2017-25) by dependent t-test.**

The mean scores and improvement in Attitude and Practice on national strategy plan however saw marked improvement post-training as seen in Table 20 and Figure 16. Participants scored higher after 3<sup>rd</sup> month of training on attitude and practice on national strategy plan of TB ( $3.13 \pm 0.62$ ) as opposed to the baseline scores ( $1.42 \pm 1.33$ ); a statistically significant increase of  $-1.72 \pm 1.03$ ,  $t = -12.9524$ ,  $p < 0.001$ . This accounted for 121.18% enhancement of scores on Attitude and Practice on the national strategic plan within the group after training. Between baseline data ( $1.42 \pm 1.33$ ) and data collected after 6<sup>th</sup>-month post-training ( $3.95 \pm 0.22$ ) the mean difference was noted to be  $-2.53 \pm 1.33$  which was statistically significant at  $t = -14.7142$ ,  $p < 0.001$ . The % enhancement in knowledge was calculated to be 178.82%, which is significantly higher as compared to the % increase between baseline and 3<sup>rd</sup> month scores. This indicated that the Community Pharmacists took some time to comprehend and adopt mandates outlined in the national strategic plans for Attitude and Practice, which is reflected in the data between the 3<sup>rd</sup> month score and 6<sup>th</sup> month score. There was insignificant improvement between scores of 3 months ( $3.13 \pm 0.62$ ) and 6 months ( $3.95 \pm 0.22$ ) which was calculated to be 26.6% increase at  $t = -11.1522$ ,  $p < 0.001$ , which was higher than what was observed for knowledge and “attitude and practice”.

**Table 20: Comparison of baseline, 3<sup>rd</sup> month and 6<sup>th</sup> month time points with attitude and practice scores towards a national strategic plan (2017-25) by dependent t-test.**

Timepoints	Mean	Std.Dv.	Mean Diff.	SD Diff.	% of change	Paired t	p-value
Baseline	1.42	1.33					
3 months	3.13	0.62	-1.72	1.03	-121.18	-12.9524	<0.001
Baseline	1.42	1.33					
6 months	3.95	0.22	-2.53	1.33	-178.82	-14.7142	<0.001
3 months	3.13	0.62					
6 months	3.95	0.22	-0.82	0.57	-26.06	-11.1522	<0.001

**Figure 16: Comparison of baseline, 3<sup>rd</sup> month and 6<sup>th</sup> month time points with attitude and practice scores towards the national strategic plan (2017-25).**



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**4.2.23 Correlation between baseline “knowledge”, “attitude and practice scores towards TB infection control” and “attitude and practice scores towards a national strategic plan” by Karl Pearson’s correlation coefficient.**

In our study, the relationship between “knowledge”, “attitude and practice towards TB control” and “attitude and practice scores towards the national strategic plan” was evaluated by Karl Pearson’s correlation coefficient to analyze how one variable affects the other. The results have been given in Table 21. No correlation was found between “knowledge” and “attitude and practice towards control of TB infection control” or between “knowledge” and “attitude and practice towards the national strategic plan”. Also, the correlation between “attitude and practice towards TB infection control ” or between “knowledge” and “attitude and practice towards the national strategic plan” was not established by Karl Pearson’s correlation. The strongest correlation was observed to be between scores for “knowledge” and scores for “attitude and practice towards national strategic plan” ( $r= 0.1397$ ,  $p=0.2870$ ), followed by the correlation between scores for “knowledge and scores for “attitude and practice towards TB control” ( $r= 0.1195$ ,  $p=0.3630$ ). In both cases, since the p-values were  $> 0.05$ , statistical significance was not strong and this could be due to the low sample size of the study ( $n=60$ ). The correlation between scores for “attitude and practice towards TB control” and that of “attitude and practice towards the national strategic plan” was also established by the Karl Pearson’s correlation coefficient analysis, but since the r values were closer to 0, the correlation was not seen as strong one ( $r=0.0502$ ,  $p=0.7030$ ).

**Table 21: Correlation between baseline “knowledge”, “attitude and practice scores towards TB infection control” and “attitude and practice scores towards a national strategic plan (2017-25)” by Karl Pearson’s correlation coefficient.**

<b>Variables</b>	<b>Summary</b>	<b>Knowledge</b>	<b>Attitude and practice towards TB control</b>	<b>Attitude and practice scores towards a national strategic plan</b>
Knowledge	r-value p-value	- -		
Attitude and practice TB	r-value p-value	0.1195 0.3630	- -	
Attitude and practice scores towards the national strategic plan	r-value p-value	0.1397 0.2870	0.0502 0.7030	- -

**4.2.24 Comparison of levels of “knowledge, attitude and practice scores towards TB infection control” and “attitude and practice towards NSP (2017-25)” at baseline, 3<sup>rd</sup> month and 6<sup>th</sup> month.**

The objectives of undertaking training for the community pharmacists, aligned with the core objective of the overall study, to introduce global and Indian scenario of TB to the community pharmacist and help them understand the basic roles of the community pharmacist in generating community awareness on TB, identification, and referral of TB suspects, DOTS provision, recording and reporting and rational use of anti TB drugs. The training was also aimed at imparting knowledge on the principles and strategy of the NTEP and Directly Observed Treatment Short-course (DOTS) to the community pharmacists.

To assess the effectiveness of the training program undertaken in our study towards fulfilling the objective outlined above, it was necessary to analyze the levels of understanding and comprehension of the Community pharmacists on each criterion. In our study, scores  $\leq 50\%$  were assigned as low level, the average level was assigned between (51-76%), and scores  $\geq 76\%$  were designated as high scores. The data were analyzed at baseline, after 3<sup>rd</sup> month and 6<sup>th</sup> month of training to evaluate the number of community pharmacists at each level of comprehension. Further, Wilcoxon matched pairs test was employed to establish the statistical significance of the data in this case.

Data on the comparison of levels of knowledge at baseline, 3<sup>rd</sup> month, and 6<sup>th</sup> month have been presented in Table 22 and Figure 17. At baseline, 10% of the Community pharmacists were found to have low levels ( $\leq 50\%$ ) of knowledge. 33 of the 60 participants were found to have high levels of knowledge regarding TB, its interventions and this constituted 55% of the sample size. Remaining 21 Community pharmacists of the 60 (35%) were recorded to have average knowledge regarding TB. After 3 months of post-training sessions on various aspects of TB viz. transmission, symptoms, interventions, and government-mandated programs, significant improvement was observed in the knowledge levels of the participants. 100% of the community pharmacists (60/60) were analyzed to have high knowledge levels ( $\geq 76\%$ ) after 3<sup>rd</sup> month of training and this data was replicated in the 6<sup>th</sup> month observation. This indicated that the effectiveness of the training program towards enhancing knowledge levels of participating community pharmacists have been very profound. Z-values obtained for Wilcoxon matched pairs test run on the data regarding knowledge levels were found to be 4.5407 which correlated to a p-

value  $< 0.001$ , which showed that the data was statistically significant in terms of the difference between the two paired groups.

Similar results were obtained when the levels of attitude and practice of community pharmacists towards TB infection control were compared and analyzed. The results have been presented in Table 23 and Figure 18. As seen from the results, at baseline the number of Community pharmacists at the low level (scores  $\leq 50\%$ ) and high levels (scores  $\geq 76\%$ ) were almost equal, the number of Community pharmacists for low level and high level being at 27 (45%) and 26 (43.3%) respectively. 7 out of 60 Community pharmacists registered average on the level scale for Attitude and Practice towards TB infection control and this constituted 11.67% of the total number of Community pharmacists. Similar to knowledge scores, after the 3<sup>rd</sup> month of the training session imparted by our study, 100% of the participants belonged to the high level (scores  $\geq 76\%$ ) category and the trend was repeated in the 6<sup>th</sup> month. In this case, training had been effective in enhancing the Attitude and Practice norms of pharmacists. Z-values obtained for Wilcoxon matched pairs test run on the data on attitude and practice scores towards TB control was found to be 5.0862 which correlated to a p-value  $< 0.001$ . This was higher than that obtained for knowledge indicating that the difference between baseline, 3<sup>rd</sup>, and 6<sup>th</sup> month was higher in case of levels of Attitude and Practice as compared to the difference between baseline, 3<sup>rd</sup>, and 6<sup>th</sup> month for knowledge.

Interesting outcomes were however obtained while comparing the Attitude and Practice scores towards national strategic plans (Table 24 and Figure 19). It details various aspects of TB in India about pathology, transmission, control, planned intervention, government-directed treatment regimes along with the roles of

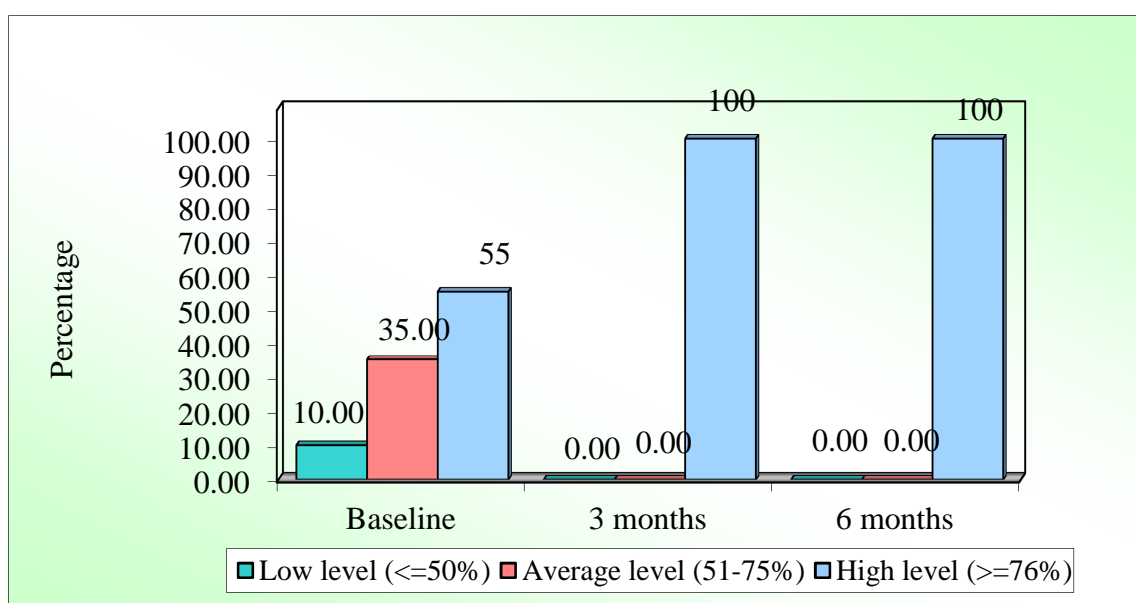
various stakeholders. In our study, we observed that 75% of the Community pharmacists (45 out of 60 community pharmacists) were found to be in the low-level range ( $\leq 50\%$  score) for Attitude and Practice towards NSP. 11 out of 60 participants (18.3%) were analyzed to be an average level and only 4 out of the 60 Community pharmacists (6.67%) were at a high level for Attitude and Practice towards national strategic plans.

Unlike “knowledge” and “attitude and practice for TB control”, after 3<sup>rd</sup> month of the training session imparted by our study, only 25% of the Community pharmacists (15 out of 60) belonged to the high level (scores  $\geq 76\%$ ) category. The number of community pharmacists in the low-level category however decreased from 45 to 6, amounting to 10% of the total number and the number of Community pharmacists at the average level increased from 11(18.3%) to 39 (65%). After the 6<sup>th</sup> month from training, 95% of the Community pharmacists were at a high level and there were no Community pharmacists at the low level. The number of Community pharmacists scoring average came down from 65% in 3<sup>rd</sup> month to 5% in the 6<sup>th</sup> month. Z-values obtained for Wilcoxon matched pairs test run on the data on Attitude and Practice scores towards a national strategic plan for baseline vs. 3 months was found to be 5.9175 which correlated to a p-value  $< 0.001$ . Z-score for Baseline vs. 6 months and that for 3 months vs. 6 months were found to be 6.4515 and 5.8413 respectively, while p-values for all the cases were noted to be  $< 0.001$ , indicating statistical significance of all the pairs tested. The higher z score for Baseline vs. 6<sup>th</sup> month reflects the improvement in Attitude and Practice towards National strategic plans after training.

**Table 22: Comparison of levels of knowledge at baseline, 3<sup>rd</sup> month and 6<sup>th</sup> month.**

Levels	Baseline	%	3 months	%	6 months	%
Low level (<=50%)	6	10.00	0	0.00	0	0.00
Average level (51-75%)	21	35.00	0	0.00	0	0.00
High level (>=76%)	33	55.00	60	100.00	60	100.00
Total	60	100.00	60	100.00	60	100.00
Wilcoxon matched-pairs test	Z-value			p-value		
Baseline vs. 3 months	4.5407			<0.001		
Baseline vs. 6 months	4.5407			<0.001		
3 months vs. 6 months	--			--		

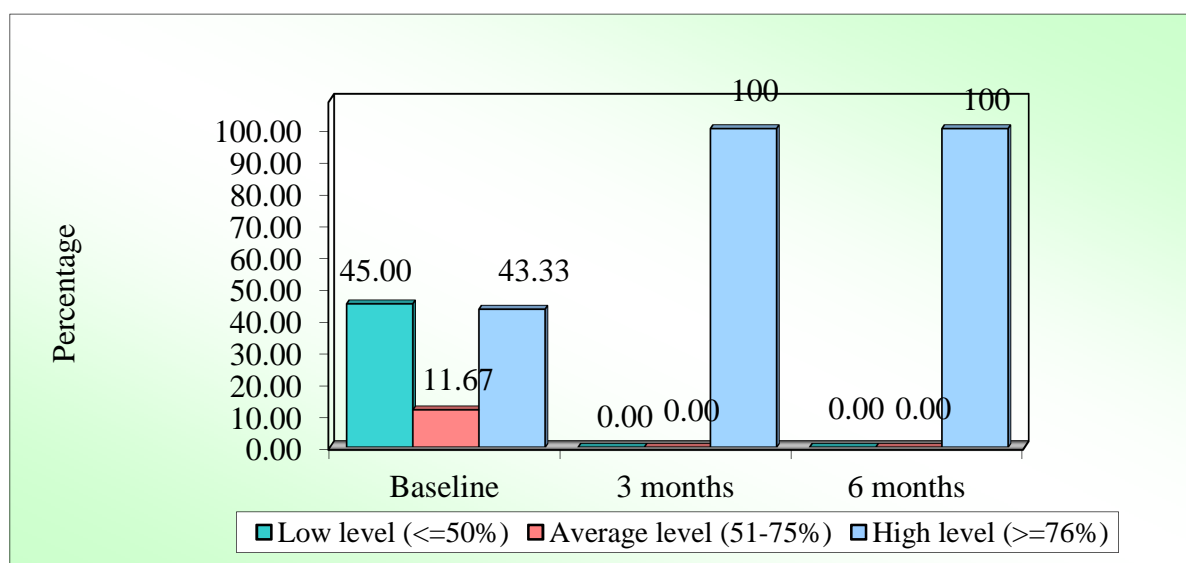
**Figure 17: Graph showing the comparison of levels of knowledge at baseline, 3<sup>rd</sup> month and 6<sup>th</sup> month.**



**Table 23: Comparison of levels of attitude and practice scores towards TB infection control at baseline, 3<sup>rd</sup> month and 6<sup>th</sup> month.**

Levels	Baseline	%	3 months	%	6 months	%
Low level ( $\leq 50\%$ )	27	45.00	0	0.00	0	0.00
Average level (51-75%)	7	11.67	0	0.00	0	0.00
High level ( $\geq 76\%$ )	26	43.33	60	100.00	60	100.00
Total	60	100.00	60	100.00	60	100.00
Wilcoxon matched-pairs test	Z-value			p-value		
Baseline vs. 3 months	5.0862			<0.001		
Baseline vs. 6 months	5.0862			<0.001		
3 months vs. 6 months	--			--		

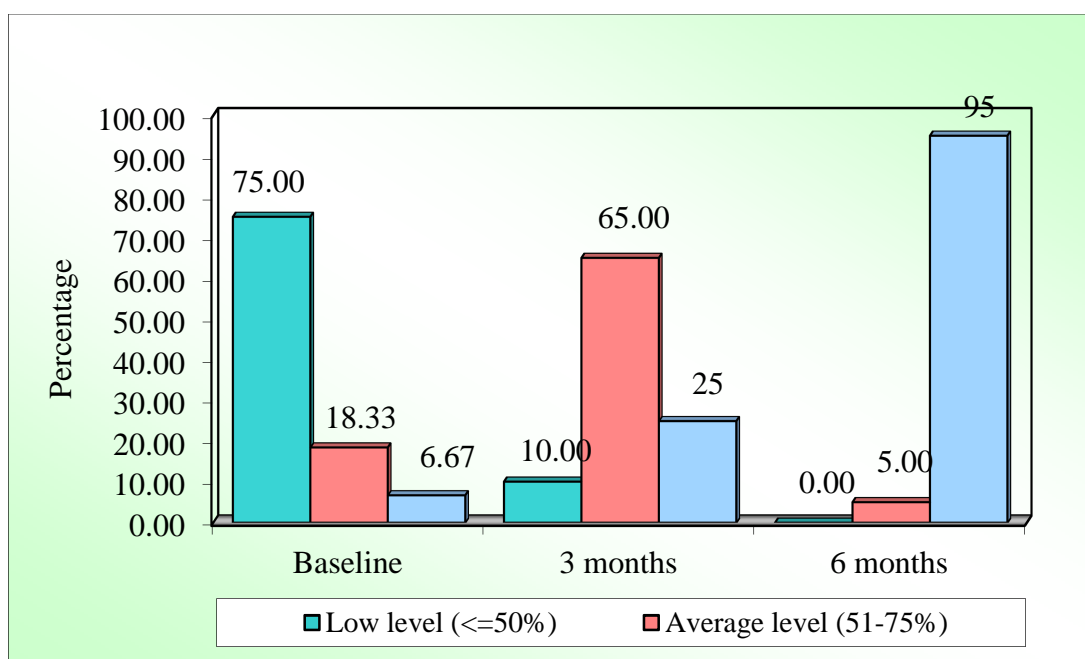
**Figure 18: Graph showing the comparison of levels of attitude and practice towards TB control at baseline, 3<sup>rd</sup> month and 6<sup>th</sup> month.**



**Table 24: Comparison of levels of Attitude and practice scores towards national strategic plan at baseline, 3<sup>rd</sup> month and 6<sup>th</sup> month.**

Levels	Baseline	%	3 months	%	6 months	%
Low level (<=50%)	45	75.00	6	10.00	0	0.00
Average level (51-75%)	11	18.33	39	65.00	3	5.00
High level (>=76%)	4	6.67	15	25.00	57	95.00
Total	60	100.00	60	100.00	60	100.00
	Z-value			p-value		
Baseline vs. 3 months	5.9175			<0.001		
Baseline vs. 6 months	6.4515			<0.001		
3 months vs. 6 months	5.8413			<0.001		

**Figure 19: Graph showing a comparison of levels of Attitude and practice scores towards national strategic plan (2017-25) at baseline, 3<sup>rd</sup> month and 6<sup>th</sup> month.**



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**4.2.25 Comparison of years of experience of participating pharmacists with baseline, 3<sup>rd</sup> month and 6<sup>th</sup> month scores on “knowledge”, “attitude and practice towards TB infection control” and “attitude and practice towards a national strategic plan (2017-25)” by one way ANOVA.**

Experience plays a great role in determining the overall skill and approach of any professional in the workplace. It was therefore of interest to evaluate the effect of experience on “knowledge”, “attitude, and practice towards control of TB” and “attitude and practice towards national strategic plans”. The participants were divided into three groups based on experience (1-10 years, 11-20 years, and  $\geq 20$  years of experience in a pharmacy setting) and the scores were analyzed by one way ANOVA to establish the effect. Here experience was designated as the independent variable. The results have been given in Table 25-27 and Figure 20-22.

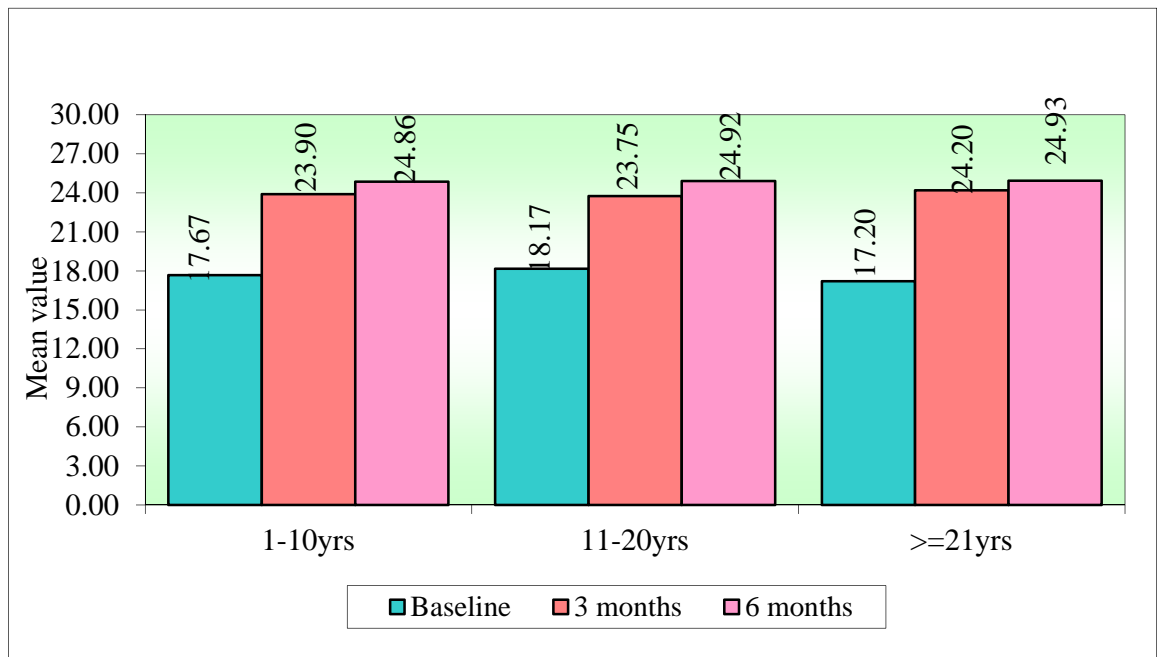
It was observed that there was not much difference between baseline scores and scores at 3<sup>rd</sup> months and 6<sup>th</sup> months for knowledge. The difference in mean scores was also similar between the three groups of experience at baseline and thereafter, indicating that training does not confirm any additional effect on knowledge related to experience. A similar trend was noticed for scores for “attitude and practice towards TB control” where the effect of experience on improving scores was not much effective in the groups of 1-10 years experience and 11-20 years experience. However, the group with  $\geq 21$  years of experience the change in mean scores was almost in the range of 50% after training, and it was significant as indicated by the p-value. The difference in mean scores between various groups based on experience was more significant in scores on “attitude and practice on national strategic plan (2017-25)”. Here the effect of intervention and training was

significant. Amongst the three groups, the difference in mean scores was highest for experience  $\geq 21$  years indicating a willingness to upgrade the knowledge and be updated. All differences in mean scores were statistically significant as indicated by p values ( $p < 0.05$ ).

**Table 25: Comparison of Experiences with baseline, 3<sup>rd</sup> month and 6<sup>th</sup> month knowledge scores by one way ANOVA.**

Experiences	Baseline		3 months		6 months	
	Mean	SD	Mean	SD	Mean	SD
1-10yrs	17.67	3.64	23.90	1.04	24.86	0.36
11-20yrs	18.17	3.48	23.75	1.59	24.92	0.28
$\geq 21$ yrs	17.20	3.43	24.20	1.01	24.93	0.26
Total	17.75	3.49	23.92	1.28	24.90	0.30
F-value	0.3560		0.5639		0.3305	
p-value	0.7020		0.5721		0.7199	
<b>Pairwise comparisons by Tukeys multiple posthoc procedures</b>						
1-10yrs vs. 11-20yrs	p=0.8836		p=0.9151		p=0.7927	
1-10yrs vs. $\geq 21$ yrs	p=0.9192		p=0.7776		p=0.7430	
11-20yrs vs. $\geq 21$ yrs	p=0.6843		p=0.5423		p=0.9851	

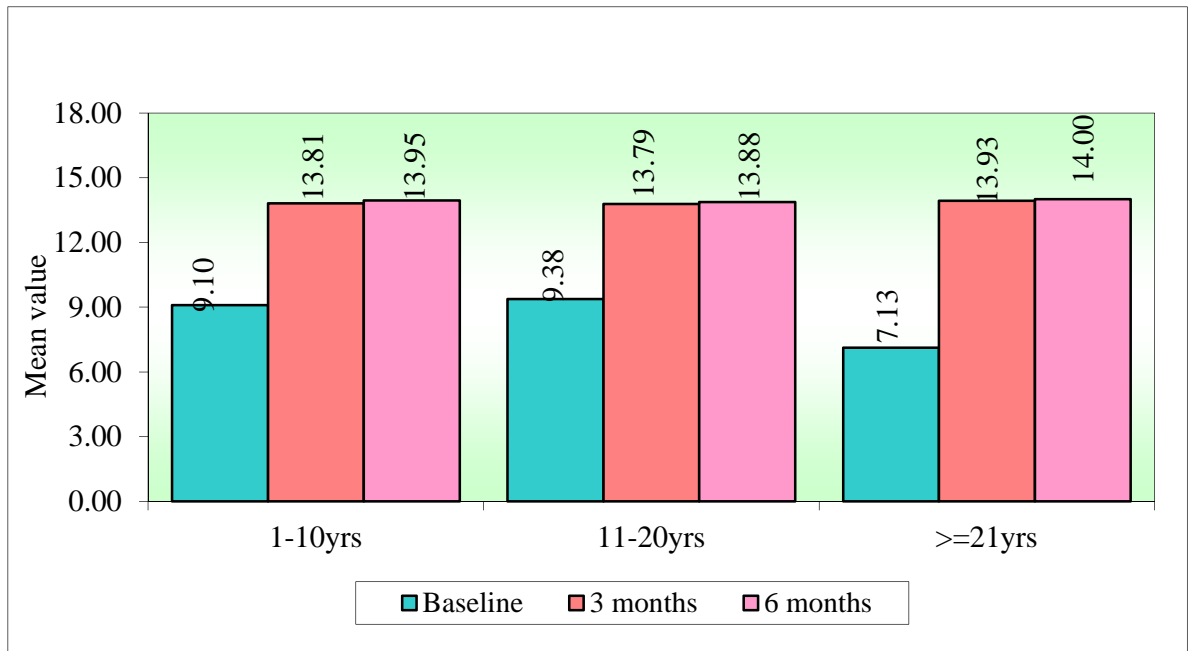
Figure 20: Comparison of Experiences with baseline, 3<sup>rd</sup> month and 6<sup>th</sup> month knowledge scores by one way ANOVA.



**Table 26: Comparison of Experiences with baseline, 3<sup>rd</sup> month and 6<sup>th</sup> month attitude and practice scores towards TB infection control by one way ANOVA.**

Experiences	Baseline		3 months		6 months	
	Mean	SD	Mean	SD	Mean	SD
1-10yrs	9.10	3.75	13.81	0.51	13.95	0.22
11-20yrs	9.38	3.08	13.79	0.59	13.88	0.34
>=21yrs	7.13	3.80	13.93	0.26	14.00	0.00
Total	8.72	3.57	13.83	0.49	13.93	0.25
F-value	2.0736		0.4106		1.2424	
p-value	0.1351		0.6652		0.2964	
<b>Pairwise comparisons by Tukeys multiple posthoc procedures</b>						
1-10yrs vs. 11-20yrs	p=0.9616		p=0.9922		p=0.5590	
1-10yrs vs. >=21yrs	p=0.2316		p=0.7435		p=0.8407	
11-20yrs vs. >=21yrs	p=0.1365		p=0.6648		p=0.2912	

Figure 21: Graph showing the comparison of Experiences with baseline, 3<sup>rd</sup> month and 6<sup>th</sup> month scores for attitude and practice towards TB infection control by one way ANOVA.

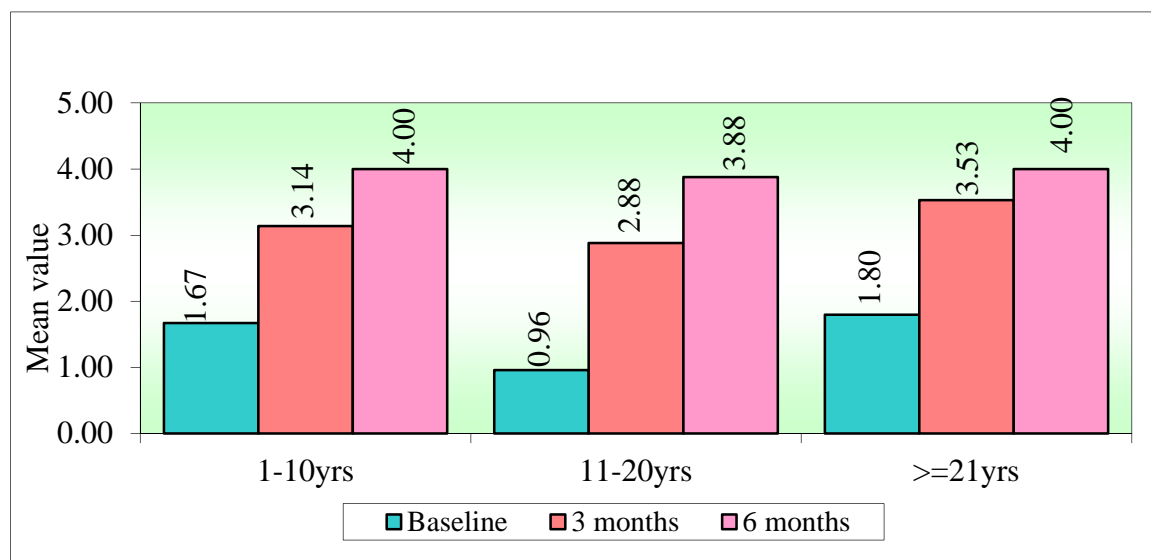


**Table 27: Comparison of Experiences with baseline, 3<sup>rd</sup> month and 6<sup>th</sup>-month Attitude and practice scores towards a national strategic plan (2017-25) by one way ANOVA.**

Experiences	Baseline		3 months		6 months	
	Mean	SD	Mean	SD	Mean	SD
1-10yrs	1.67	1.46	3.14	0.57	4.00	0.00
11-20yrs	0.96	1.12	2.88	0.61	3.88	0.34
>=21yrs	1.80	1.32	3.53	0.52	4.00	0.00
Total	1.42	1.33	3.13	0.62	3.95	0.22
F-value	2.5401		6.0276		2.4429	
p-value	0.0878		0.0042*		0.0960	
<b>Pairwise comparisons by Tukeys multiple posthoc procedures</b>						
1-10yrs vs. 11-20yrs	p=0.1703		p=0.2733		p=0.1345	
1-10yrs vs. >=21yrs	p=0.9505		p=0.1205		1.0000	
11-20yrs vs. >=21yrs	p=0.1290		p=0.0029*		p=0.1890	

\*p<0.05

**Figure 22: Graph showing a comparison of Experiences with baseline, 3<sup>rd</sup> month and 6<sup>th</sup> month scores for attitude and practice towards national strategic plan (2017-25) by one way ANOVA.**



#### 4.2.26 Randomization for intervention studies

Randomization was carried out amongst the 30 community pharmacists interested to become treatment supporter of NTEP, as per Flow chart 1 and the participants were divided into two groups:

- **The control group** (without Clinical Pharmacist): In the control group (15 community pharmacists), the only checklist was provided to know the number of tuberculosis patients receiving Anti-TB drugs. 30 tuberculosis patients were enrolled and all the patients were referred to NTEP. The follow-up of the patients were not performed in this group.
- **The Intervention Group** (With Clinical Pharmacist): In the Intervention group (15 Community Pharmacists) recruited Pulmonary TB patients to check the compliance of tuberculosis patients using Modified Kuppaswamy's Socioeconomic Status (SES) Scale 2019, MMAS-8, *FACIT - SWiP*, SF-12.

Screened 59 patients and recruited 50 patients and all the patients referred to NTEP.

➤ **Intervention components**

- ✓ ***Recruitment of Pulmonary TB patients:*** Screened 59 pulmonary Tuberculosis patients and recruited 50 patients in community pharmacies who are receiving Anti-TB drugs.
- ✓ ***Supervision and monitoring:*** Clinical pharmacists visited community pharmacies for post-training (3<sup>rd</sup> and 6<sup>th</sup> month) to assess the implementation of Community pharmacists Knowledge, attitude, and practice to deliver the best TB services.
- ✓ ***Modified Kuppaswamy's Socioeconomic Status (SES) Scale 2019*** [Annexure VI]: To assess the socioeconomic status of TB Patients .
- ✓ ***Morisky Medication Adherence Scale (MMAS-8)*** [Annexure VII]: The best self-reporting measures for assessing medication enforcement. The MMAS-8's reliability and validity were or have already been evaluated in many languages through diverse cultures, environments, and diseases.
- ✓ ***FACIT- Satisfaction With Pharmacist (SWiP)*** [Annexure VIII]: The seven elements on the Pharmacist Satisfaction (SWiP) scale was graded on a Likert scale of five points (0 = not at all to 4 = very much). TB patients feedback about community pharmacists service was recorded.
- ✓ ***Health-related QoL (SF-12)*** [Annexure IX]: The questions were grouped, graded, and weighted to establish two measures that offer

insight into mental and physical activity and general quality of life relevant to health.

- ✓ **Compliance:** Clinical pharmacist and Community pharmacist's collaborative interventions had proved a better outcome of pulmonary tuberculosis patient's treatment and care.

#### **4.3 Intervention group: Socio-demographic profiles and habits of TB patients receiving Anti TB drugs at community pharmacies**

Collaborative intervention between clinical pharmacist and community pharmacists were carried out in this group (Flow chart 1). 59 patients were screened and recruited 50 patients; all the TB patients were referred to NTEP. Data were collected from a total of 50 patients receiving Anti TB medicines from community pharmacies. The socio-demographic profiles of patients have been given in Table 28 and Table 29. 70% of the patients were males and 30% females. The mean age group of TB patients was calculated to be 37.9 years with 46% of the patients in the age group of  $\leq 30$  years. Patients within the age group of 41-50 years taking TB medicines from Community pharmacies were least in numbers accounting for 10% of the total number of TB patients. The number of TB patients belonging to rural settings (58%) was higher as compared to patients from urban areas (42%). The average weight of the patients was around 50 kgs with the highest number of patients (30%) weighing between 51-60kgs. Patients with weight above 71 kg were significantly lower (4%). 70% of the patients were married.

Modified Kuppaswamy Socioeconomic scale 2019 was used to assess the socioeconomic status of patients receiving TB medications from community pharmacies. According to this scale, the TB patients were grouped into 4

socioeconomic classes based on the monthly income of the family as shown in Table 29. In this study, 5 out of the 50 patients (10%) TB patients were illiterate and 45 (90%) were literate. Among the literate participants, the majority had completed intermediate or post-high school education (26%) followed by primary school education and secondary level education (18% each). 14 out of the 50 TB patients (28%) were educated at the university level, which is significant. 62% of the patients were employed and 38% were without any job. Those who were employed most of them worked as a semi-skilled workers (28%). According to the modified Kuppuswamy scale 2019, 36 % of the patients were earning between Rs. 7,887 to 13,160 per month (CPI). 28% of the patients earned  $\leq$  2640 Rs per month. Hence according to this scale, the majority of TB Patients (62%) belonged to the Upper Lower class. The middle class (Upper Middle and Lower Middle) together accounted for 36% of study participants. Only 2% of the total number of TB patients receiving TB medicine belonged to the lower section of the society.

Habits of the TB patients were also documented and have been presented in Table 30. Of the 50 patients Counseled, 32 reported not having any detrimental habits (64%). Within the group, 2% of the patients were found to be smokers who also consumed tobacco and alcohol. Alcohol with tobacco and smoking with tobacco accounted for 2% (each) of the study group. 14% of the patients consumed only alcohol and 6% had tobacco as the only habit. There were no exclusive smokers in the group of patients studied.

**Table 28: Socio-demographic profile of patients.**

<b>Socio-demographic profile</b>	<b>No. of patients</b>	<b>% of patients</b>
<b>Sex</b>		
Male	35	70.00
Female	15	30.00
<b>Age groups</b>		
<=30yrs	23	46.00
31-40yrs	8	16.00
41-50yrs	5	10.00
>=51yrs	14	28.00
Mean age	37.86	
SD age	16.94	
<b>Location</b>		
Rural	29	58.00
Urban	21	42.00
<b>Wight groups</b>		
<=40kg	11	22.00
41-50kg	13	26.00
51-60kg	15	30.00
61-70kg	9	18.00
>=71kg	2	4.00
Mean Wight	50.20	
SD Wight	14.20	
<b>Marital Status</b>		
Married	35	70.00
Unmarried	15	30.00

**Table 29: Socioeconomic Status of TB Patients (Modified Kuppaswamy scale (update for February 2019)).**

<b>Educations of the head of the family</b>	<b>No. of patients</b>	<b>score</b>	<b>% of patients</b>
Intermediate school or post-high school diploma	13	5	26.00
No schooling (Illiterate)	5	1	10.00
Primary school certificate	9	2	18.00
Secondary level (High school certificate)	9	4	18.00
University (Graduate or Postgraduate)	14	6	28.00
<b>Occupations</b>			
Semi-professional	4	6	8.00
Clerical, shop-owner/farm	2	5	4.00
Skilled worker	10	4	20.00
Semi-skilled worker	14	3	28.00
Unskilled worker	1	2	2.00
Unemployed	19	1	38.00
<b>Monthly Income of family (Rupees) CPI ( Consumer Price Index)</b>			
19,759 to 26,354	2	6	4.00
13,161 to 19,758	13	4	26.00
7,887 to 13,160	18	3	36.00
2,641 to 7,886	03	2	6.00
≤2,640	14	1	28.00
<b>Socioeconomic class</b>			
Upper middle	6	16-25	12.00
Lower middle	12	11-15	24.00
Upper lower	31	5-10	62.00
Lower	1	1-4	2.00
Total	50		100.00

**Table 30: Habits wise distribution of patients.**

Habits	No. of patients	% of patients
Alcohol	7	14.00
Alcohol, Smoking	3	6.00
Alcohol, Smoking, Tobacco	1	2.00
Alcohol, Tobacco	2	4.00
Smoking, Tobacco	2	4.00
Tobacco	3	6.00
No habit	32	64.00
Total	50	100.00

#### 4.3.1 Assessment of medication adherence of TB patients using MMAS-8 questionnaire.

One of the important roles that the community pharmacists play is to ensure patients adhere to the dedicated treatment regime by maintaining records or providing guidance about medication and dosage. Medication adherence plays a very crucial role in infectious diseases like TB, where discontinuing medication can lead to MDR-TB. MMAS-8 scale was most reliable to assess medication adherence [3].

Comparison of Baseline, 3<sup>rd</sup> month, and 6<sup>th</sup>-month time points in each item of MMAS scale was carried out by the Cochran Q test and Wilcoxon matched-pairs test for all the patients (Table 31). It was observed that adherence to Q5 and Q6 was significantly high after one month of training, with 84% and 88% of the patients responding positively after one month. 33 of the 50 patients responded positively for Q4 and 23 patients responded positively for Q2 and Q3 respectively after one month.

In the case of Q7 about easy of taking daily medication, none of the patients responded positively. A marked improvement in adherence was observed after 3<sup>rd</sup> months where all 50 of the patients answered positively for Q1, Q2, and Q4. Also, for other items in the questionnaire, and an increase in the number of patients adhering to the regimen was noted. After the 6<sup>th</sup> month, 100% of the patients responded positively to the questionnaire indication improvement in adherence. The data collected was found to be statistically significant for the observed Cochran's Q values and p-values <0.05.

The mean scores of MMAS-8 for all the time points were analyzed by a dependant t-test to establish the significance of the data and understand variation (Table 32). The overall mean medical adherence score of patients increased from 4.49 ( $\pm 1.69$ ) to 6.51 ( $\pm 0.76$ ) and 7.92 ( $\pm 0.27$ ) in the 3<sup>rd</sup> month and 6<sup>th</sup> month respectively indicating an increase in medication adherence among patients visiting Community pharmacies. Also, a significant increase in mean of the scores was noticed from 3<sup>rd</sup> month (6.51  $\pm 0.76$ ) to 6<sup>th</sup> month (7.92  $\pm 0.27$ ). The maximum effect on adherence was noted for the period between one month and 6<sup>th</sup> month as indicated by the t-values. The difference in medication adherence scores between the time points was statistically significant ( $p = 0.0001$ ).

Medication adherence was also evaluated in three levels-high, medium, and low based on MMAS-8 scores, and the results have been given in Table 33. In the first month, 100% of the patients were asses to be at a low level for medication adherence. After 3<sup>rd</sup> month, the % of patients in the low range decreases to 38% whereas 58% of the patients were found to be in the average category and 4% in the high category. This improvement in medication adherence was further enhanced

after the 6<sup>th</sup> month where none of the patients were at the low level, 8% at the average level, and 92% of the patients were in the high level of medication adherence. The difference between scores amongst the levels was significant for the period between 1<sup>st</sup> month to 6<sup>th</sup> month ( $Z=6.1540$ ,  $p=0.0001$ ) as compared to the other data pairs as analyzed by Wilcoxon matched-pairs tests. Z-values for 3<sup>rd</sup> month vs 6<sup>th</sup> month and 1<sup>st</sup> month vs 3<sup>rd</sup> month were noted to be 5.9052 and 4.8599 with  $p=0.0001$  indicating statistical significance.

**Table 31: Comparison of 1<sup>st</sup> month, 3<sup>rd</sup> month and 6<sup>th</sup>-month time points in each item of MMAS scale by Cochran Q test and Wilcoxon matched-pairs test.**

Items	1st month	%	3 months	%	6 months	%	Cochran Q	p-value
Q1	18	36.00	50	100.00	50	100.00	64.0000	0.0001*
Q2	23	46.00	50	100.00	50	100.00	54.0000	0.0001*
Q3	23	46.00	31	62.00	50	100.00	29.5897	0.0001*
Q4	33	66.00	50	100.00	50	100.00	34.0000	0.0001*
Q5	42	84.00	44	88.00	50	100.00	8.0000	0.0183*
Q6	44	88.00	31	62.00	50	100.00	23.5833	0.0001*
Q7	0	0.00	21	42.00	46	92.00	6.2916	0.0001*
	Mean	SD	Mean	SD	Mean	SD	Z-value	P-value
Q8	0.83	0.20	0.97	0.08	1.00	0.00	32.8462	0.0001*

\* $p<0.05$

**Table 32: Comparison of 1<sup>st</sup> month, 3<sup>rd</sup> months and 6<sup>th</sup> months time points with medication adherence scores by dependent t-test.**

Timepoints	Mean	Std.Dv.	Mean Diff.	SD Diff.	%of effect	Paired t	P-value
1st month	4.49	1.69	-2.02	1.92	-44.99	-7.4220	0.0001*
3 months	6.51	0.76					
1st month	4.49	1.69	-3.43	1.71	-76.39	-14.1848	0.0001*
6 months	7.92	0.27					
3 months	6.51	0.76	-1.41	0.78	-21.66	-12.7485	0.0001*
6 months	7.92	0.27					

\*p<0.05

**Table 33: Comparison of 1<sup>st</sup> month, 3<sup>rd</sup> month and 6<sup>th</sup>-month time points with levels of medication adherence.**

Adherence	1st month	%	3 months	%	6 months	%
Low level	50	100.00	19	38.00	0	0.00
Medium level	0	0.00	29	58.00	4	8.00
High level	0	0.00	2	4.00	46	92.00
Total	50	100.00	50	100.00	50	100.00
1 <sup>st</sup> month vs. 3 months	Wilcoxon matched-pairs, Z=4.8599, p=0.0001*					
1 <sup>st</sup> month vs. 6 months	Wilcoxon matched-pairs, Z=6.1540, p=0.0001*					
3 months vs. 6 months	Wilcoxon matched-pairs, Z=5.9052, p=0.0001*					

\*p<0.05

#### **4.3.2 Assessment of patient's satisfaction with Community pharmacists using (functional assessment of chronic illness therapy (FACIT-SWiP) method.**

FACIT – Satisfaction with Pharmacist (Version 4) questionnaire was used to determine the overall impression of TB patients towards community pharmacists. The seven elements on the Pharmacist Satisfaction (SWiP) scale was graded on a Likert scale of five points (0 = not at all to 4 = very much) at 1<sup>st</sup> month, 3<sup>rd</sup> month and 6<sup>th</sup> month of training. The mean of the scores obtained therein was analyzed by a dependant t-test to understand the effect of the training imparted in this study on patient approach.

Results of scores obtained from the FACIT scale have been tabulating in Table 34. The effect was more pronounced in the period between 1<sup>st</sup> and 6<sup>th</sup> month with the mean scores being  $27.72 \pm 0.64$  in the 6<sup>th</sup> month, the difference in mean being  $2.48 \pm 1.09$  ( $t = -16.0521$ ). Between the 3<sup>rd</sup> and 6<sup>th</sup> month, the difference in mean was calculated to be  $0.28 \pm 0.64$ , which is low, as reflected in the t value of  $-3.0929$ . The % effect was also found to be highest between the 1<sup>st</sup> and 6<sup>th</sup> months. The difference in mean scores indicates that there was an overall improvement in the interaction of community pharmacists with the patients. The improvement calculated was statistically significant as indicated by the p-value of 0.0001 ( $p < 0.05$ ).

**Table 34: Comparison of 1<sup>st</sup> month, 3<sup>rd</sup> month and 6<sup>th</sup>-month time points with scores for FACIT scale by dependent t-test.**

Time points	Mean	Std.Dv.	Mean Diff.	SD Diff.	% of effect	Paired t	P-value
1st month	25.24	0.74					
3rd month	27.44	0.91	-2.20	1.23	-8.72	-12.6587	0.0001*
1st month	25.24	0.74					
6th month	27.72	0.64	-2.48	1.09	-9.83	-16.0521	0.0001*
3rd month	27.44	0.91					
6th month	27.72	0.64	-0.28	0.64	-1.02	-3.0929	0.0001*

\*p<0.05

#### **4.3.3 Comparison of 1<sup>st</sup> month, 3<sup>rd</sup> month and 6<sup>th</sup>-month time points with SF-12 and its component scores by dependent t-test.**

The mean of the scores was calculated for the total questionnaire and also the categories to measure physical and emotional well being and the difference was estimated by the dependent t-test. Data was collected at two different time points, at 1<sup>st</sup> month and 6<sup>th</sup> month following training.

Overall, total SF-12 (Table 35) mean scores were lower after the 6<sup>th</sup> month of treatment as compared to 1<sup>st</sup> month with the difference between means being  $34.66 \pm 7.42$ . Mean scores for other categories related to mental and physical well being were also lower after 6 months of treatment as compared to 1<sup>st</sup> month. The only area where improvement was notice was general health where mean scores were  $13.56 \pm$

0.81 after 6<sup>th</sup> month and  $11.54 \pm 0.5$  at 1<sup>st</sup> month, signifying 17.50% overall effect of the intervention on general health. The maximum difference between mean scores of 6<sup>th</sup> month and the 1<sup>st</sup> month was observed for limitation in activities where the difference between mean scores was  $8.46 \pm 2.49$ . The least difference in mean scores was observed for energy and emotions where the difference was noted to be  $3.96 \pm 1.37$ . This category has lower z values as compared to other categories (20.4443). The difference between the mean scores of the two data of each category of the SF-12 questionnaire was statistically significant as indicated by the p-value. (0.0001). At the end of the study (up to one year), 46 (92%) of the 50 patients are cured from the tuberculosis and remaining 4 (8%) were lost to follow-up after the completion of six months treatment. The reduction in scores could be attributed to several other additional factors such as social isolation and/or side effects of Anti-TB medications that negatively affected health.

**Table 35: Comparison of 1st month, 3 months and 6 months time points with SF-12 and its component scores by dependent t-test.**

Variables	Time points	Mean	Std.Dv.	Mean Diff.	SD Diff.	% of effect	Z-value	P-value
Total SF-12	1st month	107.68	4.03					
	6 months	73.02	6.92	34.66	7.42	32.19	33.0089	0.0001*
General Health	1st month	11.54	0.50					
	6 months	13.56	0.81	-2.02	0.62	-17.50	-22.9502	0.0001*
Limitations Activities (Physical function)	1st month	22.92	1.01					
	6 months	14.46	2.70	8.46	2.89	36.91	20.6699	0.0001*
Physical Health Problems (Physical role)	1st month	15.92	1.01					
	6 months	8.44	2.60	7.48	2.73	46.98	19.3401	0.0001*
Emotional or mental Health Problems	1st month	12.46	0.50					
	6 months	4.54	1.33	7.92	1.21	63.56	46.3030	0.0001*
Social Activities	1st month	8.46	0.50					
	6 months	3.02	0.68	5.44	0.58	64.30	66.6533	0.0001*
Bodily Pain	1st month	8.54	0.50					
	6 months	2.20	0.61	6.34	0.82	74.24	54.4468	0.0001*
Energy, Fatigue, and Emotions	1st month	26.92	1.01					
	6 months	22.96	0.88	3.96	1.37	14.71	20.4443	0.0001*

\*p<0.05

4.3.4 Counseling photos



## 5. DISCUSSION

### 5.1 Survey of community pharmacists

Considering the widespread distribution and reach of community pharmacies to TB patients, it is imperative to establish involvement or participation of the community pharmacist in shouldering responsibilities in tackling tuberculosis. Accordingly, the research was designed to throw some light on the entire perception of pharmacists towards rendering pharmaceutical care services towards TB control. As per the review of literature, it was pre evident that pharmacists were the primary point of contact of all types of patients including tuberculosis. Because of this, several research groups started assessing the perception of the community pharmacists.

This study was undertaken with the primary objective of evaluating and engaging community pharmacists to understand their relevance in fulfilling the NTEP objectives. It was also of relevance to know the availability of Anti-TB drugs used for DOTS, dispensing patterns, and practices of community pharmacies towards Anti-TB drugs. Knowledge of community pharmacies on TB treatment guidelines and their attitude towards continuing training programs and being recognized as a treatment supporter of NTEP were also assessed in this study.

Of the 228 Community pharmacists evaluated in the study, 90.35% were males. (Table 7 and Figure 8). Pharmacy is not perceived as a career choice by most women due to stringent work policies in the pharmacy sector and other factors such as lack of mentoring because of the low ratio of women at middle and top management. In India, practicing pharmacists are required to hold a minimum of a diploma degree and possess basic clinical and pharmaceutical understanding. In our study, a majority

of the community pharmacist possessed a D. Pharm (Diploma in Pharmacy), followed by a B. Pharm (Bachelor of Pharmacy) degree and M. Pharm (Master of Pharmacy) degree. It has been previously noted that most diploma holders have a minimal working clinical knowledge and rarely undergo additional training, as compared to degree holders who have longer course duration which is structured to include training and dissertations [36].

In this study, a lack of willingness to be educated was primarily cited due to a lack of time during business hours which could also be indirectly due to any positive incentives to be trained. Lack of interest 25.43% of the pharmacists disinterests in continuing further education. This indicates that there is a significant need to improvise training and knowledge of TB as noted previously [37,38]. Interesting observations were made in this study regarding the dispensing pattern of Anti-TB drugs (Table 9 and Figure 10). 37.52% of the community pharmacies were dispensing anti-TB drugs, that too to a sizable number of patients on a monthly and weekly basis (Table 10, Table 11, and Figure 11). Receiving medicines while paying from a pocket, particularly for patients in lower socioeconomic groups who constitute a sizable fraction of TB patients, reflects on the financial burden that the TB which could be a major reason for the discontinuation of treatment midway. For pharmacies, this may be either be a profit-driven strategy or poor practice of not asking relevant questions to symptomatic patients [33].

The number of patients taking anti-TB medications regularly from Community pharmacies incidentally is quite high, considering the existence of a free treatment regime and medication for TB in the form of DOTS. This could be attributed either to the lack of awareness in the patient or Community pharmacists or unwillingness of

the pharmacist to refer patients to on-going TB programs. Most of the pharmacies reported to be getting a single patient per month (12.6%) or per week (66.6%) but this cannot be confirmed due to lack of patient follow up records. We observed that of the 37.8% community pharmacies that dispensing anti-TB drugs, only one among them as recognized as treatment supporter of NTEP and later on discontinued because of lack of monitoring by NTEP health professionals. Further, we cannot assess the quality of practice as there were no well-documented records of anti-TB drug dispensing statistics, follow-up, or patient records. Hence, the possible potential effect of the Public-Private Mix (PPM) strategy could not be realized. In a study reported by Konduri et al.,[12] the authors reported a detailed analysis indicating that though community pharmacies are an important component of the TB health-care program, they have not been used, trained, and empowered as a primary point of contact. This was reflected in our study, showing that there was only one pharmacy involved with NTEP, though a significant interest was shown by many more outlets in being a part of NTEP by involving as a treatment supporter of NTEP.

Although a significant number of Community pharmacies catered to a sizable number of TB patients on weekly as well as the monthly basis, 98.6% did not maintain any records on the patients and 99.12% did not conduct any kind of follow up (Table 12). One of the main reasons for non-maintenance of patient records could be related to the limited manpower in community pharmacies or the absence of skilled trained Community pharmacists who can accurately record data. Keeping track of TB patients is also has legal consideration which most of the Community pharmacists are unaware. Our survey also revealed that more than half of the prescriptions for Anti-TB medications that the community pharmacies dispensed were from private physicians (Table 13 and Figure 13), Earlier studies have shown that 50–80% of TB

were seeking treatment from private sector [39-41]. The fact that most of the TB patients treated either by the government or private doctors sought medication from community pharmacies indicated the lack of awareness of government-initiated free treatment regimes or disinterest/distrust in the program. Further, 20% of the community pharmacies did not have any idea if they dispensing pattern of anti-TB drugs.

## **5.2 Training of community pharmacists on NTEP-DOTS guidelines**

After evaluating data collected from the survey of community pharmacists regarding education and experience of community pharmacists, availability/non-availability of anti-TB drugs, drug dispensing pattern and interest pattern of pharmacists to become treatment supporters of NTEP-DOTS, a training program on ‘Community pharmacists as DOTS provider’ was conducted by Department of Pharmacy Practice, KLE college of Pharmacy, in collaboration with District TB control centre and the regional office of the deputy drugs controller. The training was in alignment with the secondary objective of this study to train and certify community pharmacists as a treatment supporter of NTEP. Community pharmacists, druggists, retailers, and chemists (60 in number) from Belagavi city participated in this training program, and sessions were chaired by distinguished officers of District Tuberculosis centre and the Regional office of the Deputy Drugs controller.

In training showed that 95% of the Community pharmacists were D.Pharm holders hence did not have the regimented course work or training for sound knowledge foundation (Table 14). Also, the majority of the Community pharmacist had less than 20 years of experience. Most of the community pharmacists had relevant knowledge regarding the prevalence of TB in India and the symptoms as well as

diagnostics methods before training (Table 15). Knowledge regarding the spread of TB and the use of N95 masks was poor among the pharmacists at baseline. By the end of the 6<sup>th</sup> month from initial training, the knowledge scores on TB were found to be more than 98% for all community pharmacists. In a previous study, it has been seen and proved that community pharmacies can provide TB care through training with collaboration with government sector [42].

*“Deputy drugs controller: It is one of the essential surveys to combat tuberculosis. We are ready to provide financial grants to extend the survey in rural areas. We ready to permit community pharmacists to store anti-TB drugs (with certain guidelines) as a treatment supporter of NTEP.”*

Answers to most of the queries about government designated TB control measures, guidelines of NTEP, and DOTS implementation were not known to most of the community pharmacists before training, resulting in lower attitude and practice scores. Similar observations had been made in earlier studies about TB and pharmacy workers in Peru, where the pharmacists were not aware of mandated TB treatment regimens [17]. We also found that most of the community pharmacists were unaware of the NIKSHAY app or the Public-Private Mix (PPM) for Tuberculosis control and care. Also, none of the community pharmacists had received any training from NTEP which indicates a lapse in the implementation of the TB control program, which clearly outlines that Community pharmacists are required to undergo training. Once training was imparted, a marked increase in scores about attitude and practices, statistically rendered significant, were seen within 3<sup>rd</sup> month and subsequently larger effect at 6<sup>th</sup>-month post-training (Table 19). This confirms that knowledge, attitude,

and practice improve after training of community pharmacists in a structured program about various aspects of TB.

The training on NTEP-DOTS also resulted in significant improvement of scores on attitude and practice towards the National Strategic Plan for TB eradication (NSP). Despite having a large presence, community pharmacists both in public and private sector had not been actively included in programs such as NSP [43-45]. Our findings regarding the attitude and practice of pharmacists towards national strategic plan (2017-25) show that most of the pharmacists were not familiar with the guidelines and mandates of NSP (2017-25) before training (Table 17). This is similar to findings of a study carried out on pharmacists in retail outlets who dispense anti-TB drugs but were not aware of RNTCP [46]. Within the 3<sup>rd</sup> month of imparting training, the mean scores on attitude and practice towards national strategy were greatly enhanced (Table 20), indicating the willingness to learn and contribute to TB control. 75% of the Community pharmacists were found to be at a low level for NSP details, followed by average levels, Very few (4/60) scored points to be included in high levels. After 3<sup>rd</sup> month of training, more of the Community pharmacists shifted from a low level to average level and few of them shifted from average to high based on scores. After 6 months, 3 of the 60 pharmacists were still at the average level which indicates perhaps comprehension and adaptation of NSP guidelines were difficult for community pharmacists. In contrast, since the education level and experience (> 20 years) were high for the participating pharmacists, most participants scored 100% for knowledge after 3 months.

At enrolment, the Community pharmacists were grouped into three groups based on their experience (1-10 years, 11-20 years,  $\geq 21$  years) and the scores were analysed for KAP (Tables 25-27). We observed that the change in scores for knowledge between baseline and 3 months and 6 months was not significant for all the groups, indicating that experience has not much effect on knowledge. However, in terms of attitude and practice towards TB infection control, the difference in mean scores was significantly higher (50%) for pharmacists with  $\geq 21$  years of experience.

*“Community pharmacist: We are not aware NTEP training module to upgrade the knowledge. We are interested to upgrade the knowledge in other areas also by continuing pharmacy education.”*

### **5.3 Compliance of Tuberculosis patients**

Post-training, 30 of the community pharmacists expressed their interest to become treatment supporter of NTEP and by randomization; they were divided into control group (15) and intervention group (15). The control group (without Clinical Pharmacist), the only checklist was provided to know the number of tuberculosis patients receiving Anti-TB drugs and referred 30 tuberculosis patients to NTEP was recorded. Intervention Group (With Clinical Pharmacist), screened 59 patients and recruited 50 Pulmonary TB patients to check the compliance of tuberculosis patients using Modified Kuppuswamy's Socioeconomic Status (SES) Scale 2019, MMAS-8, FACIT - SWiP, SF-12. All the patients referred to NTEP The objective of this exercise was to evaluate the effectiveness of the study-mediated training given to Community pharmacists in the patient outcome.

TB patients themselves form yet another important component of the system. Sociodemographic profiles of 50 TB patients recruited from the 59 patients screened for the collaborative intervention study were mapped out and information was collected on the distribution of habits that are known to predispose patients to TB. 70% of the patients were males, < 30 years of age, mostly from rural setup, and were married. (Table 28). Socioeconomic factors mostly assign the roles of the wage earner to younger males in the family, more so in unorganized sectors where chances of contracting the infection are much higher [47].

According to the modified Kuppuswamy modified SES scale 2019 (Table 29), most of the patients' belonged to the upper-lower section of the society with monthly income ranging from 8000 Rs- 14000 Rs. Hence it is a financial burden on the family to sustain TB treatment that is paid from the pocket. We also observed that 64% of the patients did not have any habits. Since most of the patients worked in the unorganized sector and possibly had blue-collared jobs as indicated by the Kuppusawamy scale 2019, the chances of contracting the disease at the workplace are higher. There have been several reports indicating a strong relationship between ambient air pollution exposures and TB incidences [48] and this cannot be disregarded. In this aspect, trained and empowered community pharmacies will play an indispensable role in educating TB patients and the general population on various risk factors and disease spread.

The key outcomes of the collaborative intervention between trained Community pharmacists and clinical pharmacist were to improve medication adherence, enhance satisfaction, and enhancing the quality of life of patients. In developing countries such as India, adherence to medical regimes has been estimated

to be as low as 40% [49]. At 1<sup>st</sup> month, scores for medical adherence were not high for most of the items listed on the questionnaire, particularly those about taking of daily medication and missing daily dosages, etc. (Table 24). With the collaborative efforts of the pharmacists, after the 6<sup>th</sup> month, all the 50 patients were found to be 100% adherent to medical regimes, which denoted a marked improvement over data collected in the 1<sup>st</sup> month. This shows that with proper training and awareness campaigns, the patients can be made more compliance with adhering to recommended medications and dosage. Satisfaction with the pharmacist's service was high as indicated by the negligible difference between the first month and 3<sup>rd</sup> or 6<sup>th</sup> month of FACIT scores. With their large presence in India and other developing countries, Community pharmacies play a vital role in patient engagement and patients are confident in the advice offered to by the community pharmacists, which is pivotal is designated these establishments as treatment supporters on NTEP.

*“District TB officer: The name ‘community pharmacist’ sounds good.*

*Community pharmacists are important to tackle missing cases of tuberculosis and can prevent MDR-TB. The survey had a really excellent outcome because we understand how many community pharmacies are dispensing Anti TB drugs in the city.”*

The only area where not many significant positive outcomes were obtained in this intervention study was the overall quality of life. Except in the area of general health, where the improvement was marginal; all other areas of wellbeing and the total SF-12 scores were lower at 6<sup>th</sup> month as compared to 1<sup>st</sup> month. The effect was more pronounced about activities and physical as well as mental wellbeing of the TB patients. Social isolation, pain, limited mobility, and unpleasant side effects of TB medications all work against the feeling of wellbeing, thereby reducing the quality of

life. Perhaps training modules for pharmacists developed henceforth should focus more on the counselling aspects of TB care and patient wellbeing, whereby the Community pharmacies are equipped with proper knowledge as to how to help patients have a better life. At the end of the study (up to one year), 46 (92%) of the 50 patients are cured from the tuberculosis and remaining 4 (8%) were lost to follow-up after the completion of six months treatment. Thus, we achieved the collaborative interventions between clinical pharmacist and community pharmacists in delivering better outcome in pulmonary TB patients.

## **6. SUMMARY**

Tuberculosis, a chronic bacterial infection, is a public health concern in developing countries. India accounts for almost 25% of all TB cases and deaths reported globally. The RNTCP initiated in 1992, based on the policy of Directly Observed Therapy Short-Course (DOTS), the WHO- recommended global strategy for TB control, to eradicate TB by 2025. NTEP's key mandate is towards dispensing of anti-TB medicines, free of cost for the complete treatment duration. However, many TB patients are unaware of the Government's free treatment and free medication programs and rely heavily on private physicians and community pharmacies for treatment and procuring anti-TB medicines.

India has a large number of community pharmacies dispersed all over the country which serves as the first and sometimes as the sole point of contact for TB cases. Engaging pharmacies has been deemed to be a very effective step towards dispersing knowledge, and controlling and eliminating TB in communities, and improving the quality and reach of DOTS services effectively. It, therefore, becomes imperative to understand the knowledge and practices of community pharmacies towards TB and Government initiated plans, particularly in the rural and small-town setup. The present study was carried out to evaluate the standard practice of availability of anti-tuberculosis drugs used for DOTS in tuberculosis patients and its compliance and to engage community pharmacists to partner NTEP objectives. Training and certify community pharmacies as a treatment supporter of NTEP and increasing compliance towards anti-tuberculosis drugs to improve the quality of life of patients were the other key objectives of this study.

The study was carried out in Belagavi, Karnataka, India, and encompassed registered pharmacies, with the availability of anti-TB drugs and consenting to be part of NTEP. A total of 228 community pharmacies (out of 350 identified pharmacies) were interviewed for the study along with TB patients receiving medicines at these Community pharmacies. A structured interview form was used to assess knowledge, practice, and attitude of community pharmacists towards TB infection and National Strategy Program (NSP) along with availability and non-availability of anti-TB drugs, dispensing of anti-TB drugs and dispensing pattern of anti-TB drugs by pharmacies on a weekly and monthly basis. Data on demographics of community pharmacists as well as TB patients were also recorded. Of these 60 community pharmacies were selected for imparting training as per NTEP guidelines and on information related to TB. Collected data were analyzed statistically to arrive at the findings.

It was observed that 90% of the community pharmacists were males and possessed a D. Pharm (Diploma in Pharmacy) with limited knowledge of TB. There was a lack of willingness to be rigorously trained for updating their knowledge, although they were interested in being trained for being recognized as a treatment supporter of NTEP. We observed that 37.8% of the Community pharmacies dispensed anti-TB drugs with only one among them as recognized as a treatment supporter of NTEP.

The training was imparted via workshop and classes and significant improvement in knowledge was observed after training where 96% of the pharmacists reported accurate answers to most of the questions in the questionnaire. Most of the community pharmacists had limited information regarding government designated TB control measures, guidelines of NTEP, and DOTS implementation before training

which was improved significantly within 3-6 months of training as determined by dependent t-tests. The improvement in attitude and practice towards TB infection was faster as compared to attitude and practice related to National Strategic Plans (2017-25), probably owing to the lack of training on NTEP guidelines and no prior exposure. In terms of knowledge, most of the participating Community pharmacists (33%) were at a high level at baseline, which improved to 100% after 3 months. This could be attributed to the education level of experience since most of the pharmacists had > 20 years of experience as seen from the demographic data. However, at enrollment 75% of the Community pharmacists were found to be at a low level for attitude and practice towards NSP followed by average levels, and only a few (4/60) were included in high levels. After 6 months although participants shifted from low to average levels, only a few of them shifted from average to high based on scores. This indicated that comprehension and adaptation of NSP (2017-25) guidelines were difficult for community pharmacists.

Collaborative intervention between Clinical pharmacists and Community Pharmacists assessed socioeconomic data of 50 patients receiving anti-TB medication from pharmacies enrolled for this study showed that most of the patients approaching pharmacies for anti-TB drugs were males (70%), <30 years of age, from rural setup, and were either uneducated or had education up to school level. Most of the TB patients belonged to the upper lower class of socioeconomic strata and were employed in the unorganized sectors. Training community pharmacists and enrolling local pharmacies as designated treatment supporter of NTEP will not only increase the level of TB awareness among people but will also help implement the various TB programs floated by the government to a much larger population effectively. To assess the effectiveness of TB treatment, the involvement of community pharmacists, and

overall quality of life of patients, data was collected via MMAS-8, FACIT-SWiP, and SF-12 questionnaire respectively, and analyzed statistically. It was observed that in 6<sup>th</sup>-month, medication adherence improved to 100% with the increase higher between 3<sup>rd</sup> month to 6<sup>th</sup> month, indicating the need for regular intervention and guidance to patients to stick to the treatment regime. Most of the patients were satisfied with the community pharmacies as seen from FACIT-SWiP data. However, there was no improvement in the quality of life of patients which can be attributed to social isolation and side effects of Anti-TB medications. Training community pharmacies in areas such as counseling and referral to appropriate physicians to look after the physical wellbeing of patients will be a big step toward mitigating the above-mentioned problems. From this study, we identify there is a significant need to educate and enable more community pharmacists and enroll them as treatment supporter of NTEP which may significantly enhance the TB control programs in the country.

## **7. CONCLUSION**

Continuing pharmacy education related to tuberculosis shows significant outcomes to upgrade in the field of Knowledge, attitude, and practice of community pharmacists. The collaborative research between clinical pharmacists and community pharmacists shows the best outcome to control and care for the tuberculosis patients.

## **7.1 LIMITATION OF THE STUDY**

The study was restricted in the urban area of the Belagavi. The recruitment of the study only Pulmonary Tuberculosis patients. The standard practice of hospital pharmacies were not recorded in this study. The time limit in community pharmacies is minimum to counsel patients because patients were not going to stay longer time in community pharmacies. There is a existence of social stigma in the Tuberculosis patients who are seeking treatment in private sector. The training was done only 60 community pharmacists who are interested to upgrade in KAP.

## **7.2 FUTURE DIRECTIONS**

It should be evaluated in talukas and the rural areas also because more number of community pharmacies is available in those areas. The compulsory continuing pharmacy education should be made compulsory to the community pharmacists in the field of tuberculosis to upgrade their knowledge and eradicate tuberculosis from India.

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## **ANNEXURE – I - INFORMED CONSENT FORM**

### **Evaluate Standard Practice of Availability of Anti-Tuberculosis Drugs used for DOTS in Tuberculosis Patients and its Compliance: A Randomized Controlled Study in Community Pharmacies**

#### **Informed consent form/Participant Information Sheet**

Version 1.0 Dated April 2018

**Study Site:** The study will be conducted in the Belagavi – 590010

**Investigator's name:** Dr. Uday Kumar R

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**Introduction:** I am Dr. Uday Kumar R, working for the Tuberculosis research. We are researching the Role of Community Pharmacist in TB Prevention and Care, which is a dangerous epidemic disease, a threat to life is a major public health problem accounting for substantial morbidity and mortality in the country. I am going to give you the information and invite you to be part of this research. You do not have to decide today whether or not you will participate in the research. Before you decide, you can talk to anyone you feel comfortable with about the research.

There may be some words that you do not understand. Please ask me to stop as we go through the information and I will take time to explain. If you have questions later, you can ask them to me or, the study supervisor Dr. M S Ganachari, Head - Dept. of Pharmacy Practice, K.L.E. College of Pharmacy, Belagavi – 590010.

At least 50% of tuberculosis patients are estimated to seek treatment. WHO recommendation on engaging retail drug outlets has been translated into programmatic policy, strategy, and intervention in low- and middle-income countries. To ensure Proper management in Tuberculosis patients and their contacts and to reduce tuberculosis transmission and further to address the problems and spread of Drug resistant-Tuberculosis, it is essential to collect complete information for all Tuberculosis patients.

**Purpose:** Although our objective is to Evaluate the standard practice of availability of anti-tuberculosis drugs used for DOTS in tuberculosis patients and its compliance. To engage community pharmacists to partner RNTCP objectives. To train and license community pharmacies as a DOTS provider. To increase the compliance towards anti-tuberculosis drugs- To improve the quality of life. Training module for the community Pharmacist includes various aspects of tuberculosis and the role of pharmacists in Tuberculosis (TB) care and control. The content of the module is similar to the RNTCP training module for Multi-Purpose Workers, however, modified to adapt for the training of pharmacists. At the end of this modular training, the participants will be able to:

- Get introduced to Global and Indian TB scenario
- Understand the basics of Tuberculosis (TB ) and Drug-Resistant TB
- Understand the principles and strategy of the Revised National Tuberculosis Control Program (RNTCP) and Directly Observed Treatment Short-course(DOTS)

- Understand Role of pharmacist in generating community awareness on TB, identification, and referral of TB suspects, DOT provision, recording and reporting and rational use of anti TB drugs

**Research intervention:** This research study involves two groups 1) interventional group and 2) standard care group. For interventional group community pharmacist will provide community awareness includes Distribution of TB information leaflets to TB patients, TB suspects as well as to any other patient who wishes to know/need to know more about Tuberculosis, Arrange and conduct group awareness activities, TB and DOTS awareness sessions for a community pharmacist. The patient counseling includes A patient should be made aware that tuberculosis is a life-threatening disease and tuberculosis treatment is only effective if all prescribed drugs are taken regularly for the entire prescribed duration. Then community pharmacist has to explain what is tuberculosis, and how it spreads, symptoms of tuberculosis, treatment of tuberculosis. either from the private or public sector, Information about Directly Observed Treatment (DOT), Taking some of the drugs or irregular taking of drugs is dangerous and makes the disease incurable, Motivation of the patient concerning treatment requirements and expected duration of the treatment. The amount, frequency and duration of drugs, Possible side-effects of drugs, Frequency, and importance of sputum examinations, ii sputum positive cases, Inform importance of evaluation of symptomatic contacts (e.g. family member with TB symptoms) of sputum positive patients, Inform patient regarding the infectiousness of TB to children and hence the medical officer should be consulted about the requirement of preventive treatment in children and possible infection control measures preventing the domestic transmission, Ask patient to use handkerchief/tissue while coughing, Orange/ red discoloration of the body fluids especially urine which is commonly encountered due

to rifampicin is not an adverse reaction and patient should be made aware of this, If on OCPs should be advised to use alternative methods of contraception, Patients who smoke should be motivated to make an informed decision to stop smoking. All cases should be informed personally about the harmful effects of smoking on health in general and the potential for poorer outcomes of anti-TB treatment with continued smoking, Give a copy of any TB information leaflet available. Telephonic interview and Tuberculosis patient's home visit will be made whenever required. On the other, for the standard care group, only a checklist will be provided several patients' visits in a certain period. During which participants of both groups will be monitored for study outcomes.

**Participant Selection:** Survey of availability of Anti-tuberculosis drugs in community pharmacies. Divided into Non-Availability of Anti-Tuberculosis Drugs and Availability of Anti-Tuberculosis Drugs. In the nonavailability of anti-tuberculosis drugs, we will ask consent District RNTCP. Those Pharmacists who are Interested to become DOTS Provider and RNTCP Objectives will be recruited. The survey will be conducted community pharmacist shop which is available in Belgaum city.

**Voluntary participation:** Your participation in this research is entirely voluntary. It is your choice whether to participate or not. Whether you choose to participate or not, all the services you receive at this and from this hospital will continue and nothing will change. You may change your mind later and stop participating even if you agreed earlier, even without giving any reason.

**The standard practice of RNTCP-DOTS:** For participants under an interventional group, Training for the community pharmacist, which involves Introduced to Global and Indian TB scenario, Understand basics of Tuberculosis (TB ) and Drug-Resistant TB, Understand the principles and strategy of Revised National Tuberculosis Control Program (RNTCP) and Directly Observed Treatment Short-course(DOTS), Understand Role of pharmacist in generating community awareness on TB, identification, and referral of TB suspects, DOT provision, recording and reporting and rational use of anti TB drugs. While participants under standard care group only checklist will be provided to enroll the number of patients visited community pharmacy shop in a certain period.

**Study procedure:** Your eligibility for this study will be assessed by a survey of anti-tuberculosis drugs in community pharmacies. If you match the eligibility criteria of the study, you will be allotted for one out of the two groups. Sequentially numbered, opaque, sealed envelopes (SNOSE) method will be used to allocate you in either of the group. By this method, you will be having 50:50 chances in allocating in any of the two groups.

If you are in an interventional group, training will be conducted which includes Get introduced to Global and Indian TB scenario, Understand basics of Tuberculosis (TB) and Drug-Resistant TB, Understand the principles and strategy of Revised National Tuberculosis Control Program (RNTCP) and Directly Observed Treatment Short-course(DOTS), Understand Role of pharmacist in generating community awareness on TB, identification, and referral of TB suspects, DOT provision, recording and reporting and rational use of anti TB drugs

If you are in the standard care group only a checklist will be provided in which number patients to be enrolled in a certain period.

**Duration of the study:** The research takes place over one year to two years. During that time, it is necessary to enroll and monitor tuberculosis patients. Indian Govt. Considers Private Providers as Assets for TB Control and Care to Achieve **National Strategic Plan** for TB Elimination 2017-2025. So, you can continue pharmacy education to the patients after our research also.

**The risk involved participating in the study:** By participating in this study, we don't expect that you will come across any dangerous event because of the study. Studies don't have any potential intervention, the study involves community pharmacist education sessions and other interventions if any will be made through our training modules.

**Benefits involved participating in the study:** By the education sessions, you may have a good amount of knowledge regarding the DOTS provision at the pharmacy, Join hands with National health mission (NHM), To improve the compliance of tuberculosis patients. All the services to the community pharmacist in this study will not be charged for money and will be for free.

**Incentives:** Your participation in this study will not incur any expenditure and it is purely academic research, hence you will not be paid any incentive for participation in this study. In case of nonavailability from the District RNTCP free of drugs will be provided and the incentives will be provided from district RNTCP and some conditions will be applied.

**Confidentiality:** It is possible that if others in the community are aware that you are participating in this research, they may ask you questions. We will not be sharing the identity of those participating in the research with anyone. The information that we collect from this research project will be kept confidential. Information about you that will be collected during the research will not be identified by name of the community pharmacy shop, address of the shop, year of establishment, name of the qualified person, qualification of the qualified person, contact number, E-mail address. Only the researchers will know what your number is and they will not misuse any of your details. It will not be shared with or given to anyone.

**Sharing the Results:** The knowledge that we get from doing this research will be shared with you if you are interested before it is made widely available to the public. Confidential information will not be shared. There will be small meetings in the KLE Academy of higher education and research, research committee and these will be announced. After these meetings, we will publish the results in scientific journals so that other interested people may learn from our research.

**Right to Refuse or Withdraw:** You are having rights to withdraw from the study at any time.

**Who to Contact:** If you have any questions you may ask them now or later, even after the study has started. If you wish to ask questions later, you may contact any of the following Dr. M.S Ganachari, Research Supervisor, HOD, Dept. of Pharmacy Practice, KLE College of Pharmacy, Belagavi – 590010, Mob – 9448634457, email id – [msganachari@gmail.com](mailto:msganachari@gmail.com).

This proposal has been reviewed and approved by the local institutional ethics committee of the Academic Affairs Department, KLE Academy of higher education and research, Belagavi – 590010, which is a committee whose task it is to make sure that research participants are protected from harm. If you wish to find more about the IRB, contact the local institutional ethics committee of the Academic Affairs Department, KLE Academy of higher education and research, Nehru Nagar, Belagavi – 590010.

**Certificate of consent**

I have read the foregoing information, or it has been read to me. I have had the opportunity to ask questions about it and any questions that I have asked have been answered to my satisfaction. I consent voluntarily to participate as a participant in this research and understand that I have the right to withdraw from the research at any time without in any way affecting my medical care.

**Name of Participant** \_\_\_\_\_

**Signature of Participant** \_\_\_\_\_

**Date** \_\_\_\_\_

**(Day/month/year)**

**Impartial Witness (if participant is illiterate)**

I have witnessed the accurate reading of the consent form to the potential participant, and the individual has had the opportunity to ask questions. I confirm that the individual has given consent freely.

**Name of witness** \_\_\_\_\_ **and Thumb print of participant -**

**Signature of witness** \_\_\_\_\_

**Date** \_\_\_\_\_

**(Day/month/year)**

I have accurately read or witnessed the accurate reading of the consent form to the potential participant, and the individual has had the opportunity to ask questions. I confirm that the individual has given consent freely.

**Print Name of Researcher** \_\_\_\_\_

**Signature of Researcher** \_\_\_\_\_

**Date** \_\_\_\_\_

**(Day/month/year)**

A copy of this Informed Consent Form has been provided to participant by the researcher/assistant)

ಕ್ಷಯರೋಗ ರೋಗಿಗಳಿಗೆ ನೀಡುತ್ತಿರುವ ಆಂಟಿಬಯೋಲೋಜಿಕ್ ಔಷಧಿಗಳ ಲಭ್ಯತೆಯನ್ನು  
ಬಳಸಲಾಗುತ್ತಿರುವ ಡಾಟ್ ಪ್ರಮಾಣಿತ ಅಭ್ಯಾಸವನ್ನು ಮೌಲ್ಯಮಾಪನ ಮಾಡುವುದು ಮತ್ತು ಅದರ  
ಅನುಸರಣೆ ಮಾಡುವುದು: ಎ ರಾಂಡಮೈಸ್ಡ್ ಕಂಟ್ರೋಲ್ಡ್ ಸಮುದಾಯ ಔಷಧಾಲಯಗಳಲ್ಲಿನ  
ಅಧ್ಯಯನ

ಅಧ್ಯಯನ ಭಾಗವಹಿಸುವವರ ಮಾಹಿತಿ ಪತ್ರ  
ಆವೃತ್ತಿ 1.0 ದಿನಾಂಕ ಎಪ್ರಿಲ್ 2018

ಸ್ಥಡಿ ಸೈಟ್: ಅಧ್ಯಯನವನ್ನು ಬೆಳಗಾವಿ - 590010ರಲ್ಲಿ ನಡೆಸಲಾಗುತ್ತದೆ

ತನಿಖಾಧಿಕಾರಿ ಹೆಸರು: ಡಾ. ಉದಯ್ ಕುಮಾರ್. ಆರ್

ಫುಲ್-ಟೈಮ್ ಪಿಎಚ್‌ಡಿ ಸಂಶೋಧನಾ ವಿದ್ವಾಂಸ

ಫಾರ್ಮಸಿ ಪ್ರಾಕ್ಟೀಸ್ ವಿಭಾಗ

ಕೆ.ಎಲ್.ಇ ಕಾಲೇಜು ಆಫ್ ಫಾರ್ಮಸಿ ಬೆಳಗಾವಿ - 590010

ಮೊ. 9686873535

ಇಮೇಲ್ ಐಡಿ - [uk96868735352@gmail.com](mailto:uk96868735352@gmail.com)

ಪರಿಚಯ:

ನಾನು ಡಾ. ಉದಯ್ ಕುಮಾರ್ ಆರ್, ಕ್ಷಯರೋಗ ಸಂಶೋಧನೆಯಲ್ಲಿ ಕೆಲಸ ಮಾಡುತ್ತಿದ್ದೇನೆ. ನಾವು ಟಿಬಿ ತಡೆಗಟ್ಟುವಿಕೆ ಮತ್ತು ಸಮುದಾಯ ಔಷಧಿಕಾರರ ಬಗ್ಗೆ ಸಂಶೋಧನೆ ಮಾಡುತ್ತಿದ್ದೇವೆ. ಕ್ಷಯರೋಗ ಅಪಾಯಕಾರಿ ಸಾಂಕ್ರಮಿಕ ರೋಗ, ದೇಶದಲ್ಲೆಲ್ಲ ಗಣನೀಯ ಪ್ರಮಾಣದ ರೋಗವಾಗಿದೆ ಮತ್ತು ಪ್ರಮುಖ ಸಾರ್ವಜನಿಕ ಆರೋಗ್ಯ ಸಮಸ್ಯೆಯಾಗಿದೆ. ನಾನು ನಿಮಗೆ ಮಾಹಿತಿಯನ್ನು ನೀಡುತ್ತೇನೆ ಮತ್ತು ಈ ಸಂಶೋಧನೆಯ ಭಾಗವಾಗಿ ನಿಮ್ಮನ್ನು ಆಹ್ವಾನಿಸುತ್ತೇನೆ. ನೀವು ಸಂಶೋಧನೆಯಲ್ಲಿ ಪಾಲ್ಗೊಳ್ಳಲಿವೆಯೆಂದು ಇಲ್ಲವೋ ಎಂಬುದನ್ನು ನೀವು ನಿರ್ಧರಿಸಬಹುದು. ನೀವು ನಿರ್ಧರಿಸುವ ಮೊದಲು, ನೀವು ಸಂಶೋಧನೆಯ ಬಗ್ಗೆ ಯಾರ ಹತ್ತಿರವಾದರೂ ಮಾತನಾಡಬಹುದು.

ನಿಮಗೆ ಅರ್ಥವಾಗದ ಕೆಲವು ಪದಗಳಿಗೆ, ದಯವಿಟ್ಟು ಮಾಹಿತಿ ಮೂಲಕ ಓದುವಾಗ ನನ್ನನ್ನು ನಿಲ್ಲಿಸುವಂತೆ ಹೇಳಿ ಮತ್ತು ನಾನು ವಿವರಿಸಲು ಸಮಯ ತೆಗೆದುಕೊಳ್ಳುತ್ತೇನೆ. ನೀವು ನಂತರ ಪ್ರಶ್ನೆಗಳನ್ನು ಹೊಂದಿದ್ದರೆ, ನೀವು ನನ್ನನ್ನು ಕೇಳಬಹುದು ಅಥವಾ ಅಧ್ಯಯನ ಮೇಲ್ವಿಚಾರಕ ಡಾ. ಎಂ. ಎಸ್. ಗಣಾಚಾರಿ, ಹೆಡ್ ಡಿಪಾರ್ಟ್‌ಮೆಂಟ್ ಆಫ್ ಫಾರ್ಮಸಿ ಪ್ರಾಕ್ಟೀಸ್, ಕೆ.ಎಲ್.ಇ. ಕಾಲೇಜು ಆಫ್ ಫಾರ್ಮಸಿ, ಬೆಳಗಾವಿ -590010.

ಉದ್ದೇಶ:

ನಮ್ಮ ಉದ್ದೇಶಗಳು ಕ್ಷಯ ರೋಗಿ ಮತ್ತು ಅದರ ಅನುವರ್ತನೆಯಲ್ಲಿ ಡಾಟ್ ಬಳಸಲಾಗುವ ಕ್ಷಯರೋಗ ವಿರೋಧಿ ಔಷಧಿಗಳ ಲಭ್ಯತೆಯ ಗುಣಮಟ್ಟದ ಅಭ್ಯಾಸವನ್ನು ಮೌಲ್ಯಮಾಪನ ಮಾಡುವುದು. ಸಮುದಾಯ ಔಷಧಾಲಯಗಳನ್ನು ಡಾಟ್ ಪೂರೈಕೆದಾರರಾಗಿ ತರಬೇತಿ ಮತ್ತು ಪರವಾನಿಗೆ ಮಾಡುವುದು. ಕ್ಷಯರೋಗ ವಿರೋಧಿ ಔಷಧಿಗಳ

ಅನುಸರಣೆಯನ್ನು ಹೆಚ್ಚಿಸುವುದು, ಜೀವನದ ಗುಣಮಟ್ಟವನ್ನು ಸುಧಾರಿಸುವುದು, ಇದಕ್ಕಾಗಿ ಸಮುದಾಯದ ಔಷಧಾಲಯಗಳಲ್ಲಿನ ಫಾರ್ಮಿಸಿಸ್ಟ್‌ಗೆ ತರಬೇತಿಯನ್ನು ನೀಡುವುದು. ನಮ್ಮ ತರಬೇತಿಯಲ್ಲಿ ಕೆಳಗಿನ ಅಂಶಗಳನ್ನು ಹೊಂದಿರುತ್ತದೆ.

1] ಜಾಗತಿಕ ಮತ್ತು ಭಾರತೀಯ ಟಿಬಿ ಸನ್ನಿವೇಶವನ್ನು ಪರಿಚಯಿಸುವುದು.

2] ಕ್ಷಯ (ಟಿಬಿ) ಮತ್ತು ಔಷಧಿಗಳ ಬಗ್ಗೆ ಅರ್ಥಮಾಡಿಸುವುದು.

3] RNTCP ಮತ್ತು DOTS ತಂತ್ರಗಳನ್ನು ಅರ್ಥಮಾಡಿಸುವುದು.

**ಸಂಶೋಧನಾ ಹಸ್ತಕ್ಷೇಪ (ಕಮ್ಯೂನಿಟಿ ಫಾರ್ಮಿಸಿಸ್ಟ್):**

ಈ ಸಂಶೋಧನಾ ಅಧ್ಯಯನವು ಎರಡು ಗುಂಪುಗಳನ್ನು ಒಳಗೊಂಡಿದೆ 1) ಇಂಟರ್ವೆನ್ಷನಲ್ ಗುಂಪು ಮತ್ತು 2) ಸ್ಟ್ಯಾಂಡರ್ಡ್ ಕೇರ ಗ್ರೂಪ್ (ಕಂಟ್ರೋಲ್ ಗ್ರೂಪ್). ಕಂಟ್ರೋಲ್ ಗ್ರೂಪ್‌ನಲ್ಲಿ ಚೆಕ್ ಅಸ್ಟ್ ನೀಡಲಾಗುವುದು. ಈ ಚೆಕ್ ಅಸ್ಟ್‌ನಲ್ಲಿ ಎಷ್ಟು ಜನ ಕ್ಷಯ ರೋಗಿಗಳು ಬಂದು ಡ್ರಗ್ ಖರೀದಿ ಮಾಡುವವರು ಎಂದು ತಿಳಿಯುವುದು. ಕ್ಷಯ ರೋಗಿಯನ್ನು ಆರ್.ಎನ್.ಟಿ.ಸಿ.ಪಿ ಗೆ ತಿಳಿಸುವುದು. ಇಂಟರ್ವೆನ್ಷನಲ್ ಗುಂಪಿನಲ್ಲಿ ಕ್ಲಿನಿಕಲ್ ಫಾರ್ಮಿಸಿಸ್ಟ್ ಮತ್ತು ಕಮ್ಯೂನಿಟಿ ಫಾರ್ಮಿಸಿಸ್ಟ್ ಜೊತೆಗೂಡಿ ಅಧ್ಯಯನ ಮಾಡುವುದು. ಈ ಅಧ್ಯಯನದಲ್ಲಿ ಕ್ಷಯರೋಗಿಗಳ ಆರೈಕೆ ಮಾಡುವುದು, ಅವರ ಸಂಪೂರ್ಣ ಚಿಕಿತ್ಸೆ ಮುಗಿಸುವುದಕ್ಕೆ ಸಹಾಯ ಮಾಡುವುದು, ಗುಣಮಟ್ಟದ ಜೀವನವನ್ನು ಹೆಚ್ಚು ಮಾಡುವುದು, ಮತ್ತು ಕ್ಷಯ ರೋಗಿಯನ್ನು ಆರ್.ಎನ್.ಟಿ.ಸಿ.ಪಿ ಗೆ ತಿಳಿಸುವುದು. ಈ ಇಂಟರ್ವೆನ್ಷನಲ್ ಗುಂಪಿನಲ್ಲಿ ಕ್ಷಯ ರೋಗಿಯು ನಮ್ಮ ಸೇವೆಗೆ ಅಭಿಪ್ರಾಯ ನೀಡಬಹುದು.

**ಭಾಗವಹಿಸುವ ಆಯ್ಕೆ:**

ಮೊದಲಿಗೆ ಬೆಳಗಾವಿಯಲ್ಲಿರುವ ಕಮ್ಯೂನಿಟಿ ಫಾರ್ಮಿಸಿಸ್ಟ್‌ಗಳ ಸರ್ವೆ ಮಾಡಲಾಗುವುದು. ಈ ಸರ್ವೆಯಲ್ಲಿ ಯಾವ ಕಮ್ಯೂನಿಟಿ ಫಾರ್ಮಿಸಿಸ್ಟ್‌ಗಳಿಗೆ ಅವರ ವಿದ್ಯಾಭ್ಯಾಸವನ್ನು ಹೆಚ್ಚಿಸಿಕೊಳ್ಳಲು ಆಸಕ್ತಿ ಇದೆಯೋ ಅವರು ನಾವು ಮಾಡಲಾಗುವ ತರಬೇತಿಯಲ್ಲಿ ಪಾಲ್ಗೊಳ್ಳಬಹುದು ಮತ್ತು ಕಮ್ಯೂನಿಟಿ ಫಾರ್ಮಿಸಿಸ್ಟ್‌ಗಳು ಆರ್.ಎನ್.ಟಿ.ಸಿ.ಪಿ ಜೊತೆ ಕೈ ಜೋಡಿಸುವುದು.

**ಸ್ವಯಂಪ್ರೇರಿತ ಭಾಗವಹಿಸುವಿಕೆ:**

ಈ ಸಂಶೋಧನೆಯ ನಿಮ್ಮ ಭಾಗವಹಿಸುವಿಕೆ ಸಂಪೂರ್ಣವಾಗಿ ಸ್ವಯಂಪ್ರೇರಿತವಾಗಿದೆ. ಭಾಗವಹಿಸಲು ಅಥವಾ ಇಲ್ಲವೇ ಎಂಬುದು ನಿಮ್ಮ ಆಯ್ಕೆಯಾಗಿದೆ. ನೀವು ಯಾವುದೇ ಕಾರಣವನ್ನು ನೀಡದೆ ಮತ್ತು ಪಾಲ್ಗೊಳ್ಳುವುದನ್ನು ನಿಲ್ಲಿಸಬಹುದು.

**ಆರ್.ಎನ್.ಉ.ಸಿ.ಪಿ/ಡಾಟು ಅಭ್ಯಾಸ:**

ಕ್ಷಯ ರೋಗಿಗಳು ಖಾಸಗಿ ಆಸ್ಪತ್ರೆಗಳಲ್ಲಿ/ಕ್ಲಿನಿಕ್ ಚಿಕಿತ್ಸೆಯನ್ನು ತೆಗೆದುಕೊಳ್ಳುತ್ತಿರುವ ರೋಗಿಯನ್ನು ಗುರುತಿಸುವುದು, ಅವರನ್ನು ಆರ್.ಎನ್.ಉ.ಸಿ.ಪಿ ಯಲ್ಲಿ ಮಾಹಿತಿ ನೀಡುವುದು. ಕ್ಷಯ ರೋಗಿಯ ಚಿಕಿತ್ಸೆಯನ್ನು ಸಂಪೂರ್ಣಗೊಳಿಸುವುದಕ್ಕೆ ಸಹಾಯ ಮಾಡುವುದು. ಕಮ್ಯೂನಿಟಿ ಫಾರ್ಮಸಿಸ್ಟ್‌ಗಳನ್ನು ಡಾಟು ಪ್ರೋವೈಡರ್‌ಗಳನ್ನಾಗಿ ಮಾಡುವುದು. ಕಮ್ಯೂನಿಟಿ ಫಾರ್ಮಸಿಸ್ಟ್‌ಗಳಿಗೆ ತರಬೇತಿಯನ್ನು ನೀಡುವುದು.

**ಅಧ್ಯಯನ ಅವಧಿ:**

ಈ ಸಂಶೋಧನೆಯು 1 ವರ್ಷದಿಂದ 2 ವರ್ಷಗಳ ಕಾಲ ನಡೆಸಲಾಗುವುದು.

**ಈ ಅಧ್ಯಯನದಲ್ಲಿ ಭಾಗವಹಿಸುವ ಅಪಾಯಗಳು:**

ಈ ಅಧ್ಯಯನದಲ್ಲಿ ಪಾಲ್ಗೊಳ್ಳುವುದರಿಂದ ನಿಮಗೆ ಯಾವುದೇ ರೀತಿಯ ಅಪಾಯ ಸಂಭವಿಸುವುದಿಲ್ಲ.

**ಅಧ್ಯಯನದಲ್ಲಿ ಭಾಗವಹಿಸುವ ಪ್ರಯೋಜನಗಳು:**

ನಾವು ನಿಮಗೆ ಉಚಿತ ತರಬೇತಿಯನ್ನು ನೀಡುತ್ತೇವೆ. ಇದರಿಂದ ನೀವು ನಿಮ್ಮ ವಿದ್ಯಾರ್ಹತೆಯನ್ನು ಹೆಚ್ಚಿಸಿಕೊಳ್ಳಬಹುದು.

**ಪ್ರೋತ್ಸಾಹ (ಇನ್‌ಸೆಂಟಿವ್):**

ಈ ಅಧ್ಯಯನದ ನಿಮ್ಮ ಭಾಗವಹಿಸುವಿಕೆಯು ಯಾವುದೇ ಖರ್ಚಿಗೆ ಒಳಗಾಗುವುದಿಲ್ಲ ಮತ್ತು ಇದು ಸಂಪೂರ್ಣವಾಗಿ ಶೈಕ್ಷಣಿಕ ಸಂಶೋಧನೆಯಾಗಿದೆ. ಆದ್ದರಿಂದ ಈ ಅಧ್ಯಯನದಲ್ಲಿ ಪಾಲ್ಗೊಳ್ಳುವಿಕೆಯನ್ನು ನಿಮಗೆ ಯಾವುದೇ ಪ್ರೋತ್ಸಾಹ ನೀಡಲಾಗುವುದಿಲ್ಲ.

**ಗೌಪ್ಯತೆ:**

ಈ ಸಂಶೋಧನಾ ಯೋಜನೆಯಿಂದ ನಾವು ಸಂಗ್ರಹಿಸಿದ ಮಾಹಿತಿಯು ಗೌಪ್ಯವಾಗಿರುತ್ತದೆ. ನಿಮ್ಮ ಎಲ್ಲಾ ವೈಯಕ್ತಿಕ ಮಾಹಿತಿಯು ಗೌಪ್ಯವಾಗಿರುತ್ತದೆ.

**ಫಲಿತಾಂಶಗಳ ಹಂಚಿಕೆ:**

ಈ ಸಂಶೋಧನೆಯಿಂದ ಕಳೆಯಬಹುದಾದ ಸಲುವಾಗಿ ನಾವು ಫಲಿತಾಂಶಗಳನ್ನು ವೈಜ್ಞಾನಿಕವಾಗಿ ಪ್ರಕಟಿಸುತ್ತೇವೆ.

**ನಿರಾಕರಿಸುವ ಅಥವಾ ಹಿಂತೆಗೆದುಕೊಳ್ಳುವ ಹಕ್ಕು:**

ನೀವು ಆಯ್ಕೆ ಮಾಡಿದ ಯಾವುದೇ ಸಮಯದಲ್ಲಿ ಸಂಶೋಧನೆಯಲ್ಲಿ ಪಾಲ್ಗೊಳ್ಳುವುದನ್ನು ನಿಲ್ಲಿಸಬಹುದು. ನಿಮ್ಮ ಆಯ್ಕೆ ಮತ್ತು ಎಲ್ಲ ಹಕ್ಕುಗಳನ್ನು ಗೌರವಿಸಲಾಗುವುದು.

**ಯಾರನ್ನು ಸಂಪರ್ಕಿಸಬೇಕು:**

ನೀವು ಯಾವುದೇ ಪ್ರಶ್ನೆಗಳನ್ನು ಹೊಂದಿದ್ದರೆ ನೀವು ಈಗಲೇ ಅಥವಾ ನಂತರ ಪ್ರಶ್ನೆಗಳನ್ನು ಕೇಳಬಹುದು. ಡಾ. ಎಂ. ಎಸ್. ಗಣಾಚಾರಿ, ಸಂಶೋಧನಾ ಮೇಲ್ವಿಚಾರಕರು, ಫಾರ್ಮಸಿ ಪ್ರಾಕ್ಟೀಸ್ ವಿಭಾಗ, ಕೆ.ಎಲ್.ಇ. ಕಾಲೇಜು ಆಫ್ ಫಾರ್ಮಸಿ, ಬೆಳಗಾವಿ - 590010, ಮೊ. 9448634457, ಇಮೇಲ್ ಐಡಿ- [msganachari@gmail.com](mailto:msganachari@gmail.com)

**ಸಮ್ಮತಿ ಪ್ರಮಾಣ ಪತ್ರ:**

ನಾನು ಮೇಲ್ಕಂಡ ಮಾಹಿತಿಯನ್ನು ಓದಿದ್ದೇನೆ ಮತ್ತು ಅದರ ಬಗ್ಗೆ ಪ್ರಶ್ನೆಗಳನ್ನು ಕೇಳಲು ಅವಕಾಶ ಹೊಂದಿದ್ದೇನೆ. ನಾನು ಕೇಳಿದ ಯಾವುದೇ ಪ್ರಶ್ನೆಗಳು ತೃಪ್ತಿ ತಂದಿದೆ. ನಾನು ಸ್ವಯಂಪ್ರೇರಿತವಾಗಿ ಭಾಗವಹಿಸುತ್ತೇನೆ.

**ಸಹಭಾಗಿದಾರರ ಹೆಸರು:**

**ಸಹಿ/ಹೆಚ್ಚರಳನ ಮುದ್ರೆ**

**ಸಾಕ್ಷಿದಾರರ ಹೆಸರು:**

**ಸಹಿ/ಹೆಚ್ಚರಳನ ಮುದ್ರೆ**

**ಸಂಶೋಧಕರ ಹೆಸರು:**

**ಸಹಿ**

ಭಾಗವಹಿಸುವವರು \_\_\_\_\_ಗೆ ಈ ತಿಳುವಳಿಕೆಯ ಸಮ್ಮತಿಯ ಪತ್ರವನ್ನು ಒದಗಿಸಲಾಗಿದೆ.

क्षयरोगाच्या रूग्णांमध्ये डॉटसाठी वापरल्या जाणाऱ्या क्षयरोग विरोधक औषधांच्या उपलब्धतेचा मानक प्रथाने मुल्यपामन करणे आणि अनुपालन : समुदाय औषधनिर्माण शास्त्रामध्ये एक यादृच्छिक नियंत्रण अभ्यास

सहभाग्यासाठी माहिती पत्रक

आवृत्ती १.०

दिनांक : एप्रिल २०१८

अभ्यासाची जागा : बेळगावी मध्ये हा अभ्यास केला जाईल.  
अन्वेषण कर्त्याचे नांव : डॉ. उदय कुमार आर.  
पूर्ण वेळ पी.एच.डी. रिसर्च विव्दान फार्मसी  
प्रॅक्टिस विभाग के.एल.ई. कॉलेज फार्मसी  
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परिचय :-

मी डॉ. उदय कुमार क्षयरोगाच्या संशोधनावर काम करत आहे. क्षयरोगांची काळजी व प्रतिबंध घेण्यात समुदाय औषध दातांची भूमिका काय आहे. ह्यावर संशोधन करत आहोत. क्षयरोग हा अतिशय धोकादायक साथीचा रोग आहे. देशांतील बहुसंख्य लोकांसाठी विकृती व मृत्यूदायक रोग आहे. मी तुम्हाला क्षयरोगाबद्दल काही माहिती देणार आहे व तसेच माझ्या या संशोधनाचा हिस्सा होण्यासाठी आमंत्रित करू इच्छितो. जरी तुम्हाला या संशोधनाचा हिस्सा व्हायचे आहे, हे आज तुम्ही ठरवले नसेल पण तुम्ही तुमचा निर्णय घेण्यापूर्वी एखाद्या सल्लागार व्यक्तीकडून सल्ला घेऊ शकता.

इथे असे काही शब्द आहेत जे तुम्हाला समजणार नाहीत. अशा परिस्थितीत तुम्ही मला लगेच विचारू शकता, मी तुम्हाला समजावून सांगण्याचा प्रयत्न करेन. तुम्हाला नंतर काही प्रश्न असतील तर तुम्ही मला किंवा माझ्या पर्यवेक्षकाला एम.एस. गणाचारी, मुख्य - फार्मसी प्रॅक्टिस विभाग के. एल. ई. कॉलेज ऑफ फार्मसी बेळगावी - ५१००१०

क्षयरोगाच्या उपचाराचा उपयोग हा फक्त ५०% रूग्णांना घेता येतो. जागतिक आरोग्य संघटनेच्या अंतर्गत किरकोळीने विक्री करण्याऱ्या औषधांचा एका धोरणात बदल करण्यात आला आहे. आणि यांचा फायदा कमी उत्पन्न असलेल्या देशांना होणार आहे. क्षयरोग्यांचे योग्य व्यवस्थापन त्यांचे संपर्क, क्षयरोगाची कमतरता कमी करण्यासाठी, नंतरच्या समस्यांचा हाल व औषध प्रतिरोधक क्षयरोग त्यासाठी सर्व क्षयरोग्यांची माहिती असणे गरजेचे आहे.

उद्देश :-

जरी आमचा हेतू, क्षयरोगाच्या रूग्णांमध्ये वापरले जाणारे डॉट्स चे क्षयरोग विरोधक औषधांचे मानक पध्दतीन मुल्यमापन करणे व त्यांचे अनुपालन सुधारीत राष्ट्रीय क्षयरोग नियंत्रण कार्यक्रमाच्या उद्दिष्टामध्ये समुदाय औषध दात्याला सहभागी करून घेणे. डॉट्स चा प्रदाता म्हणून समुदाय औषध दात्याला प्रशिक्षण आणि परवाना देणे. क्षयरोग्यांची जीवनशैली सुधारण्यासाठी क्षयरोग विरोधक औषधांचे अनुपालन वाढवणे.

समुदाय औषध दात्याच्या प्रशिक्षण विभागामध्ये क्षयरोगाचे विविध पैलू आणि क्षयरोगांची काळजी व प्रतिबंध घेण्यात समुदाय औषध दात्याची भूमिका यांचा समावेश होतो. मॉड्यूलची सामग्री बहुउद्देशीय कार्यकर्त्यांसाठी आर.एन.टी.सी.पी. प्रशिक्षण मोहीम सारखीच आहे. तथापि औषधदात्याच्या प्रशिक्षणासाठी अनुकूल करण्यात आले आहे.

असंख्य वारंवारता आणि औषधांचा कालावधी औषधांचे संभाव्य दुष्परिणाम, थूंक परिक्षणाचे महत्व, थूंक चाचणीचे परिक्षण सकारात्मक असेल तर, थूंक सकारात्मक रूपांच्या लक्षणासंबंधी मूल्यांकन (उदा. कुटुंबातील सदस्यासह ) मुलांना क्षयरोग नासधूसक्षमतेबद्दल माहिती द्या आणि म्हणूनच वैद्यकीय अधिकाऱ्यास मुलांमधील प्रतिबंधात्मक उपचारांची गरज आणि घरगुती रोगाचा प्रसार रोखण्यासाठी संभाव्य संसर्ग नियंत्रणाचा सल्ला द्यावा. खोकला आल्यास रूमाल वापरणे, नारंगी /लाल विवर्णीभवन शरिराची द्रव्य सामान्यतः मुत्र हे रिफॉम्पिसिनमुळे होते. पण हे औषधांचे दुष्परिणाम नाहीत यांच्या विषयी रुग्णांना जागरूक केले पाहिजे. ओ.सी.पीच्या (OCPs) वर गर्भनिरोधकच्या पर्यायी पध्दतीचा वापर करण्याचा सल्ला दिला, जे तरुण धूम्रपान करतात त्यांना धूम्रपान सोडण्यासाठी प्रोत्साहन दिले पाहिजे. धूम्रपान सोडण्यासाठी सगळ्या प्रकारांमध्ये धूम्रपानाचा शरिरावर/आरोग्यावर काय हानिकारक परिणाम होतात. आणि क्षयरोग विरोधक औषधे घेताना धूम्रपानामुळे उपचारावर होणारा परिणाम या विषयी माहिती दिली पाहिजे , उपलब्ध, असलेले कोणतेही क्षयरोगाचे माहिती पत्रक द्या. टेलीफोन मुलाखत आणि क्षयरोग रुग्णांना आवश्यक असेल तेंव्हा घरी भेट दिली जाईल. दुसऱ्या बाजूला, मानक काळजी समुहामध्ये केवळ काही काळ तपासणी यादी विशिष्ट रुग्णांना दिली जाईल. या दरम्यान दोन्ही गटातील सहभागीला परिणामांसाठी अभ्यास केला जाईल.

**या मॉड्यूल :** ट्रेनिंगच्या शेवटी सहभागी खालील गोष्टी करू शकतील

- १) जागतीक आणि भारतीय क्षयरोग रुग्णांच्या परिस्थितीशी परिचय
- २) क्षयरोग आणि औषध प्रतिरोधक क्षयरोगाचे मूलभूत ज्ञान
- ३) सुधारित राष्ट्रीय क्षयरोग नियंत्रण कार्यक्रम व थेट उपचार कार्यक्रमाची तत्वे आणि धोरण समजून घेणे.
- ४) क्षयरोगाची जागरूकता निर्माण करण्यात औषधदात्याची भूमिका, क्षयरोग संशयित ओळख, व संदर्भ थेट उपचार कार्यक्रमाची तरदूत, व क्षयरोग विरोधक औषधांचा योग्य वापर.

**संशोधन हस्तक्षरप : -**

ह्या संशोधन अभ्यासात दोन गटाचा समावेश आहे.

- १) मध्यवर्ती गट २) मानक १ उच्च काळजी गट.

मध्यवर्ती गटासाठी समुदाय औषधदाता जागरूकता प्रधान करून देईल ज्यामध्ये क्षयरोगींना क्षयरोगाचे माहितीपत्रक वितरित करणे, क्षयरोग तसेच इतर रूग्ण ज्यांना क्षयरोगाबद्दल अधिक माहिती हवी आहे, जाणण्याची इच्छा आहे अशा रुग्णासाठी गट जागरूकता कार्यक्रम आयोजित करणे व समुदाय औषधदात्यासाठी क्षयरोग जागृत सत्र. क्षयरोग हा धोकादायक रोग आहे. याची जाणीव रुग्णांना व्हायला हवी,

आणि क्षयरोगामध्ये उपचार तेंव्हाच प्रभावी आहे जेंव्हा सर्व निर्धारित औषधे संपूर्ण निर्धारित कालावध नियमित घेतली. समुदाय औषधदात्याला क्षयरोग म्हणजे काय, आणि ते कसे पसरते, क्षयरोगाची तक्षयरोगाचे उपचार हे समजावून सांगणे गरजेचे आहे. एकतर खाजगी किंवा सार्वजनिक क्षेत्रातील औषधोपचार संबंधी माहिती काही औषधे घेणे किंवा अनियमित घेणे हे धोकादायक आणि रोग असाध्य उपचारांच्या आवश्यकते नुसार रूग्णांची अपेक्षित कालावधी.

### सहभाग्याची निवड

समुदायी फार्मसी मध्ये क्षयरोग विरोधक औषधांच्या उपलब्धतेचे सर्वेक्षण करणे. क्षयरोग वि औषधांचे उपलब्ध असलेल्या व नसलेल्या गटात विभाजन करणे, उपलब्ध नसलेल्या गटामध्ये औष मागणीसाठी जिल्ह्यातील आर. एन.टी.सि.पी. च्या कडून परवाना घेण्यात येणे. डॉट्स प्रदा आर.एन.टी.सि.पी. च्या हेतूसाठी जे औषधदाता इच्छूक आहेत. त्यांना भरती केले जाते. बेळगावी मध्ये उ असलेल्या समुदाय औषधदात्याच्या केंद्रामध्ये सर्वेक्षण आयोजित करण्यात येणे.

### ऐच्छिक सहभाग :-

या संशोधनात तुमचा सहभाग हा पूर्णपणे ऐच्छिक असतो. हि तुमची निवड असेल सहभाग घ्यायच किंवा तुम्ही सहभाग घ्या अथवा नका घेऊ, ज्या काही सेवा तुम्हाला येथे आणि रूग्णालयात मिळतार तशाच पुढेपण राहतील आणि यामध्ये कोणताही बदल होणार नाही. तुम्ही तुमचा निर्णय बदलू शकता सहभाग घेणे थांबवू शकता जरी तुम्ही आधी सहमत असला तरीही, अगदी कोणतेही कारण न देता.

### ची सभ्यास पध्दती आर.एन.टि.सी.पी. डॉट्स :-

मध्यवर्ती गटातील सगळ्यासाठी, समुदाय औषधदात्याचे प्रशिक्षण, ज्यामध्ये जागतीक भारतीय क्षयरोगांच्या परिस्थितीशी परिचय करणे, क्षयरोग आणि औषध परिरोधक क्षयरोग यांचे मुलभुत सुधारित राष्ट्रीय क्षयरोग नियंत्रण कार्यक्रमाची व थेट उपचार कार्यक्रमाची तत्वे, क्षयरोगाची जागरूकता र करण्यात औषधदात्याची भूमिका, क्षयरोग संशयित व्यक्तीची ओळख व संदर्भ, थेट उपचार कार्यक्रमाची तक्षयरोग विरोधक औषधांचा योग्य केवळ विशिष्ट कालावधीत भेट दिलेल्या समुदायीन औषधाच्या ं नामनिर्देशित रूग्णांना नामनिर्देशित करण्यासाठी चेकलिस्ट उपलब्ध करून दिली जाईल.

### अभ्यासाची प्रक्रीया :-

या अभ्यासासाठी आपली पात्रता ही समुदाय औषधनिर्माता केंद्रामध्ये क्षयरोग विरोधक औष सर्वेक्षणाव्दारे केला जाईल जर तुम्ही अभ्यासाच्या पात्रतेला जूळला तर तुमचे दोन्ही गटामधून एका गटात केले जाईल. क्रमशः संख्या आपारदर्शक, सिलबंद लीफाफे पध्दतीचा वापर आपण या गटाच्या एका विः केला जाऊ शकतो. त्या पध्दतीने तुम्हाला दोन समुहापैकी कोणत्याही एका गटात वाटप करण्याचे आहे.

**संधी असतील :-**

जर तुम्ही मध्यवर्ती गटात असाल तर, प्रशिक्षण आयोजित केले जाईल ज्यात जागतिक व भारतीय क्षयरोग्याच्या परिस्थितीचा परिचय, क्षयरोग आणि औषध प्रतिरोधक क्षयरोगाचे मुलभूत ज्ञान, सुधारित राष्ट्रीय क्षयरोग नियंत्रण कार्यक्रम व थेट उपचार कार्यक्रमाची तत्वे आणि धोरण समजून घेणे.

क्षयरोगाची जागरूकता निर्माण करण्यात औषधदात्याची भूमिका, क्षयरोग संशयित व्यक्तीची ओळख व संदर्भ थेट उपचार कार्यक्रमाची तरतूद व क्षयरोग विरोधक औषधांचा योग्य वापर :

जर तुम्ही मानक काळजी गटात असाल तर तुम्हाला नामनिर्देशित रूग्णाना नामनिर्देशित करण्यासाठी चेकलिस्ट उपलब्ध करून दिली जाईल.

**अभ्यासाची कालावधी :-**

संशोधन हे एक ते दोन वर्षासाठी होणार आहे. त्यावेळी क्षयरोगांच्या रूग्णाची नोंदणी करणे व त्याचे परिक्षण करणे आवश्यक आहे. भारतीय सरकार क्षयरोग नियंत्रणासाठी मालमत्ता म्हणून खाजगी पुरवठा दारांचा विचार करा, आणि क्षयरोग टाळण्यासाठी राष्ट्रीय धोरणात्मक योजना २०१६-२०२५ नुसार प्राप्त करा तुम्ही तुमचे शिक्षण या संशोधनानंतर चालू ठेवू शकता.

**अभ्यासात सहभागी होण्याचा धोका :-**

या अभ्यासात सहभागी होऊन, अभ्यासामुळे आपल्याला कोणत्याही धोकादायक घटनेचा सामना करावा लागणार नाही याची अपेक्षा करू नका अभ्यासात कोणत्याही प्रकारचा संभव्य हस्तक्षेप नाही. या अभ्यासामध्ये समुदाय औषधदात्याचे शिक्षण सत्र आणि इतर हस्तक्षेप जर तर कोणी अभ्यासाच्या विभागामधून बनवले असतील.

**अभ्यासात सहभागी होण्याचा लाभ :-**

शैक्षणिक सत्रात आपल्याला औषध निर्माण केंद्र डॉट्सची तरदुत राष्ट्रीय आरोग्य मोहिमेत हात घालणे, क्षयरोगाच्या रूग्णांचे अनुपालन सुधारणे यासंबंधीचे ज्ञान चांगले असू शकते. या अभ्यासात समुदाय औषधदात्यासाठी सर्व सेवांवर शुल्क आकारले जाणार नाही ते विनामूल्य असतील.

**प्रोत्साहन :-**

या अभ्यासात सहभागामध्ये कोणत्याही खर्चाचा समावेश नाही. आणि हे पूर्णपणे शैक्षणिक संशोधन आहे. म्हणून या अभ्यासात सहभाग घेण्यासाठी कोणत्याही प्रकारचे प्रोत्साहन दिले जाणार नाही. जिल्हा आर.एन.टी.सि.पी. कडून विनामूल्य औषधे उपलब्ध नसल्यास जिल्हात आर.एन.टी.सी.पी. कडून काही प्रोत्साहन दिले जाईल आणि काही अटी लागू केल्या जातील.

**गुप्तता :-**

हे शक्य आहे, की जर समाजातील इतरांना माहिती आहे की आपण या संशोधनात सहभागी आहोत तर ते आपल्याला प्रश्न विचारतील आम्ही कोणत्याही विषयात संशोधन करणाऱ्या लोकांशी ओळख करीत नाही. या संशोधन प्रकल्पातून जी माहिती गोळा केली जाते ती गुप्त असेल. संशोधन दरम्यान संकलित केल्या जाणारी आपल्याबद्दलची माहिती समुदायातील औषध निर्माण केंद्र नांवानुसार ओळखली जाणार नाही. दुकानाचा पत्ता, स्थापना वर्ष ई-मेल पत्ता, केवळ संशोधक सांगतील की, आपला नंबर काय आहे आणि ते आपल्या कोणत्याही तपशीलाचा दुरुपयोग करणार नाहीत. कोणासही सामायिक केले जाणार नाही किंवा दिले जाणार नाही.

**सामायिक परिणाम :-**

हे संशोधन सार्वजनिकरित्या लोकापर्यंत पोहोचवण्याआधी आपल्याला स्वारस्य असेल तर ते आपल्याशी शेअर केले जाईल. गुपीत माहिती ही कोणत्याही सांगितली जाणार नाही. के.एल.ई. मध्ये छोटी सभा जाहीर घेतली जाईल, संशोधनसमिती आणि त्यास अनुमोहित केले जाईल. ह्या छोट्याशा बैठकीनंतर आम्ही वैज्ञानिकांनी केलेल्या संशोधनातून असे निष्कर्ष काढू शकेन की इतर आंतरजातीय लोक आमच्या अभ्यासातून शिकू शकतील.

**नाकारण्याचा किंवा काढण्याचे अधिकार :-**

आपण हे संशोधन करू इच्छित नसल्यास आणि सहभागी होण्यास नकार दिल्याने या कोणत्याही उपचार पध्दतीत आपल्या उपचारावर परिणाम होणार नाही. या रूग्णालयात अन्यथा आपल्याकडे असे सर्व फायदे असतील. आपण येथे रूग्ण म्हणून कोणतेही अधिकार न गमावता आपण इच्छित असलेल्या कोणत्याही वेळी संशोधन क्षेत्रात सहभागी होणे थांबवू शकता. या क्लिनीकावर आपल्या उपचारावर कोणत्याही प्रकारे परिणाम होणार नाही किंवा आपण असे करू इच्छित नसल्यास या संशोधनात सहभागी होणे आवश्यक नाही. निवडलेल्या कोणत्याही वेळी आपण संशोधनामध्ये देखील सहभागी होऊ शकता ही आपली निवड असेल आणि आपल्या सर्व अधिकारांचा येथे आदर केला जाईल.

**कोणाशी संपर्क साधावा :-**

जर तुम्हाला काही प्रश्न असतील तर ते तुम्ही तिथे लगेच किंवा नंतर विचारू शकता. जर तुम्हाला प्रश्न नंतर विचारायचे असतील तर तुम्ही त्या नंबर वर संपर्क साधा डॉ. एम. एस. गणाचारी, पर्यवेक्षक, एच. ओ.डी. (मुख्य) फार्मसी प्रॅक्टिस विभाग के.एल.ई. कॉलेज ऑफ फार्मसी, बेळगावी ५१००१० मो. क्र.९४४८६३४४५० ई-मेल- uk9686735352@gmail.com या प्रस्तावाचा आडावा आणि शैक्षणिक घडामोडी विभागाच्या संस्थात्मक निती समितीने मान्यता दिली आहे. के.एल.ई. उच्च शिक्षण आणि संशोधन बेळगावी ५१००१० जी एक समिती आहे जिचे कार्य हे सुनिश्चित करण्यासाठी आहे. की संशोधन सहभागी हानी पासून सुरक्षित आहेत.

आपण आय. आर. बी. बद्दल अधिक जाणून घेऊ इच्छित असल्यास, शैक्षणिक व्यवहार विभाग स्थानिक संस्थात्मक नैतिक समितीला संपर्क करा के.एल.ई. उच्च शिक्षण संस्था आणि संशोधन नेहरू नगर, बेळगावी -५१००१०.

संमती प्रमाण पत्र :-

संमती पत्राचे अचूक वाचन केलेले आहे. किंवा हे माझ्यासाठी वाचले गेले आहे. मला या बदल प्रश्न विचारण्याची संधी मिळाली आहे. मी विचारले आहे की कोणत्याही प्रश्नांची उत्तरे माझ्या समाधानतेस सेण्यात आली आहे. मी या संशोधनामध्ये सहभागी म्हणून सहभागी होण्यासाठी स्वतःने संमती दिली आहे आणि समजून घेतो की कोणत्याही वेळी कोणत्याही व्यसनमुक्तीच्या कारणाशिवाय माझा शोध मागे घेण्याचा अधिकार माझ्याकडे आहे.

सहभाग्याचे नांव : -----

सहभाग्याची सही : -----

दिनांक : -----

निःपक्षपाती साक्षीदार

मी, संभाव्य सहभागास संमती फॉर्मचे अचूक वाचन पाहिले आहे. आणि व्यक्तिला प्रश्न विचारण्याची संधी मिळाली आहे.

सहभाग्याचे नांव : -----

सहभाग्याच्या /सहभागीचा अंगुठा :

सहभाग्याची सही : -----

संभाव्य सहभागी व्यक्तिके संमती फॉर्मचे अचूकपणे वाचन केले आहे. आणि वैयक्तिक रित्या प्रश्न विचारण्याची संधी मिळाली आहे.




संशोधकाचे नांव : -----

संशोधकाची सही : -----

दिनांक : -----



## ANNEXURE – III - SURVEY QUESTIONNAIRES

		
<b>Questionnaires for Availability of Anti-Tuberculosis Drugs in Community Pharmacies</b>		
<b>Community Pharmacy Details</b>		
1) Name of the community Pharmacy Shop: _____		
2) Address of the Shop: _____		
3) Year of the Establishment: _____		
4) Name of the Qualified Person (QP): _____		
5) Qualification of the Qualified Person (QP): _____		
6) Mobile no., E-mail, Landline: _____		
<p>1) Are you interested in Continuing Pharmacy Education: <input type="checkbox"/> Yes <input type="checkbox"/> No</p> <p>A) If <input type="checkbox"/> No:</p> <p>1) <input type="checkbox"/> Not Interested <input type="checkbox"/> Don't have time</p> <p>B) If <input type="checkbox"/> Yes:</p> <p>1) <input type="checkbox"/> Interested in E-mail <input type="checkbox"/> Interested in Onsite Training</p> <p>2) <input type="checkbox"/> Interested In Formal Education Programme:  <input type="checkbox"/> Morning <input type="checkbox"/> Afternoon <input type="checkbox"/> Preferred Day:</p> <p>2) Do you know about Tuberculosis: <input type="checkbox"/> Yes <input type="checkbox"/> No</p> <p>A) Is Tuberculosis is a Communicable Disease?: <input type="checkbox"/> Yes <input type="checkbox"/> No</p> <p>B) Are You aware of Tuberculosis Symptoms: <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Partially</p> <p>3) Do you Store Anti-Tuberculosis Drugs: <input type="checkbox"/> Yes <input type="checkbox"/> No</p> <p>A) If No <input type="checkbox"/>:</p> <p>1) Are you Interested in Storing Anti-Tuberculosis Drugs: <input type="checkbox"/> Yes <input type="checkbox"/> No</p> <p>2) Are you aware of RNTCP Training Programme for the Community Pharmacist: <input type="checkbox"/> Yes <input type="checkbox"/> No</p> <p>B) If <input type="checkbox"/> Yes:</p> <p>1) How many Patient do you expect per week: <input type="checkbox"/> Yes <input type="checkbox"/> No</p> <p>2) Since how long you are Dispensing Anti-Tuberculosis Drugs: <input type="checkbox"/> Yes <input type="checkbox"/> No</p> <p>3) Do you have Record or Data of Tuberculosis Patients: <input type="checkbox"/> Yes <input type="checkbox"/> No</p> <p>4) How Do you Follow the Patients:  <input type="checkbox"/> Telephonically <input type="checkbox"/> Social Media <input type="checkbox"/> Direct Communication <input type="checkbox"/> Don't Follow</p> <p>4) Are you Part of RNTCP Objectives: <input type="checkbox"/> Yes <input type="checkbox"/> No</p> <p>A) If <input type="checkbox"/> Yes:</p> <p>1) Are you Interested in Recognizing as a Official DOTS Centre: <input type="checkbox"/> Yes <input type="checkbox"/> No</p> <p>B) If <input type="checkbox"/> No:</p> <p>1) Are you Interested in RNTCP and Recognize as a DOTS Centre: <input type="checkbox"/> Yes <input type="checkbox"/> No</p> <p>5) Whom you Receive Prescription:  <input type="checkbox"/> Govt. Physician <input type="checkbox"/> Private Physician <input type="checkbox"/> Self Medication</p>		
Signature and Seal/Stamp of Community Pharmacist		

Sr. No:

---

**ANNEXURE – IV - KAP QUESTIONNAIRES****Community Pharmacist Knowledge, Attitude and Practice based Questionnaires**

Community Pharmacists name:

Gender:

Education:

Age Experience:

Address:

Name and Signature of qualified Pharmacist

**Knowledge of TB infection control**

Please Tick any one (True or False)

1. Is TB transmission is airborne  
A) True   
B) False
2. Knowledge that TB is frequent in India  
A) True   
B) False
3. Drug-resistant TB is a serious problem in India?  
A) True   
B) False
4. TB is almost always a curable disease  
A) True   
B) False
5. Sputum evaluation is an effective diagnostic test for pulmonary TB  
A) True   
B) False
6. Most effective TB treatment is given by RNTCP  
A) True   
B) False
7. Cough is the most common symptom of pulmonary TB  
A) True   
B) False
8. TB is frequent in Belagavi district?  
A) True   
B) False

**9. MDR-TB consequences of not completing TB treatment or taking it irregularly**

A) True

B) False

**10. Knowledge that TB is highly contagious**

A) True

B) False

**11. Family member can be a DOT provider**

A) True

B) False

**12. TB is often spread from person to person through sex**

A) True

B) False

**13. TB is often spread from person to person through the air**

A) True

B) False

**14. TB is often spread from person to person through blood**

A) True

B) False

**15. Usually, only people with active TB disease in the lungs or throat are infectious**

A) True

B) False

**16. Patients with active TB disease can infect people by coughing**

A) True

B) False

**17. Patients with active TB disease can infect people by sharing food or drinks**

A) True

B) False

**18. Patients with active TB disease can infect people by sharing bed linens or toilet seats**

A) True

B) False

**19. Patients with active TB disease can infect people by talking**

A) True

B) False

**20. N95 masks protect healthcare workers and visitors by stopping TB particles from being breathed in**

A) True

B) False

**21. Surgical masks protect healthcare workers and visitors by stopping TB particles from being breathed in**

A) True

B) False

**22. A wet or dirty N95 can still be used**

A) True

B) False

**23. Surgical masks keep TB patients from coughing TB particles into the air**

A) True

B) False

**24. Keeping doors and windows open helps to reduce the spread of TB**

A) True

B) False

**25. Most MDR-TB and XDR-TB patients catch MDR and XDR disease inside the hospital**

A) True

B) False

## Attitude and Practice of TB infection control

Please Tick any one (Yes or No)

1. Does pharmacy staff counsel on the importance of other close family members being tested/evaluated for TB?  
A) Yes   
B) No
2. Does a pharmacy staff take medical history from the client?  
A) Yes   
B) No
3. Does pharmacy staff counsel clients on the correct use/adherence to the prescription?  
A) Yes   
B) No
4. Do you think TB medicines should not be sold as OTC medicines?  
A) Yes   
B) No
5. Do you think it should be mandatory to keep records of all TB prescriptions?  
A) Yes   
B) No
6. Do you think the involvement of pharmacies contributes to increasing case detection and that this is an effective step by the RNTCP?  
A) Yes   
B) No
7. Have you received training from the RNTCP?  
A) Yes   
B) No
8. Are you aware of Public Private Mix (PPM) for Tuberculosis control and care?  
A) Yes   
B) No

**9. Does RNTCP is providing Fixed dose combination/daily regimen to Tuberculosis patients?**

A) Yes

B) No

**10. Did you know that Incentives will be provided to community pharmacist by RNTCP, if community pharmacist are become DOTS provider?**

A) Yes

B) No

**11. Did you know that Incentives will be provided to community pharmacist RNTCP, if community pharmacists notify privately treated tuberculosis to RNTCP?**

A) Yes

B) No

**12. Did you know that Community pharmacist can download NIKSHAY App and can directly notify patients to RNTCP?**

A) Yes

B) No

**13. Did you know that Community pharmacist can use NIKSHAY app for TB patient's management?**

A) Yes

B) No

**14. Did you know that Provision of Community pharmacist as DOTS provider through RNTCP?**

A) Yes

B) No

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**Attitude and Practice of TB infection control (NSP 2017-25)****Please Tick the correct Answer (Any one)****1. What is primary objective of RNTCP?**

A) 1. To achieve and maintain a TB treatment success rate of at least 85% among new sputum positive (NSP) patients.

2. To achieve and maintain detection of at least 70% of the estimated new sputum positive people in the community.

B) 1. To achieve and maintain a TB treatment success rate of at least 100% among new sputum positive (NSP) patients.

2. To achieve and maintain detection of at least 100% of the estimated new sputum positive people in the community.

**2. Which anti-TB drug is contraindicated in pregnancy?**

A) Streptomycin, Kanamycin, Amikacin

B) Isoniazide, Rifampicin, Ethambutol

**3. In RNTCP, ACSM stands for**

A) 1. Adherence, communication and social mobilization

2. Revised National TB Control Partner

B) 1. Advocacy, communication and social mobilization

2. Revised National TB Control Programme

**4. What is Multi-Drug resistant tuberculosis (MDR-TB)?**

A) Resistant to treatment with at least two of the most powerful first-line anti-TB medications (drugs), isoniazid and rifampin.

B) Resistant to treatment with at least two of the most powerful first-line anti-TB medications (drugs), ethambutol and pyrazinamide.

## ANNEXURE – V - KAP ANSWERS

### Community Pharmacist Knowledge, Attitude and Practice based Questionnaires

**Community Pharmacists name:**

**Gender:**

**Education:**

**Age Experience:**

**Table 1: Knowledge of TB infection and Control**

Sl. No.	Knowledge variables (True or false)
1.	Is TB transmission is airborne (True)
2.	Knowledge that TB is frequent in India (True)
3.	Drug-resistant TB is a serious problem in India? (True)
4.	TB is almost always a curable disease (True)
5.	Sputum evaluation is an effective diagnostic test for pulmonary TB (True)
6.	Most effective TB treatment is given by RNTCP (True)
7.	Cough is the most common symptom of pulmonary TB (True)
8.	TB is frequent in Belagavi district? (True)
9.	MDR-TB consequences of not completing TB treatment or taking it irregularly (True)
10.	Knowledge that TB is highly contagious (True)
11.	Family member can be a DOT provider (True)
12.	TB is often spread from person to person through sex (false)
13.	TB is often spread from person to person through the air (true)
14.	TB is often spread from person to person through blood (false)

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15.	Usually, only people with active TB disease in the lungs or throat are infectious (true)
16.	Patients with active TB disease can infect people by coughing (true)
17.	Patients with active TB disease can infect people by sharing food or drinks (false)
18.	Patients with active TB disease can infect people by sharing bed linens or toilet seats (false)
19.	Patients with active TB disease can infect people by talking (true)
20.	N95 masks protect healthcare workers and visitors by stopping TB particles from being breathed in (true)
21.	Surgical masks protect healthcare workers and visitors by stopping TB particles from being breathed in (false)
22.	A wet or dirty N95 can still be used (false)
23.	Surgical masks keep TB patients from coughing TB particles into the air (true)
24.	Keeping doors and windows open helps to reduce the spread of TB (true)
25.	Most MDR-TB and XDR-TB patients catch MDR and XDR disease inside the hospital (true)

**Table 2: Attitude and Practice of TB infection control**

Sl. No.	Attitude and Practice Variables (Yes or No)
1.	Do pharmacy staff counsel on the importance of other close family members being tested/evaluated for TB?
2.	Does pharmacy staff take medical history from the client?
3.	Does pharmacy staff counsel clients on the correct use/adherence to the prescription?
4.	Do you think TB medicines should not be sold as OTC medicines?
5.	Do you think it should be mandatory to keep records of all TB prescriptions?
6.	Do you think the involvement of pharmacies contributes to increasing case detection and that this is an effective step by the RNTCP?
7.	Have you received training from the RNTCP?
8.	Are you aware of Public Private mix (PPM) for Tuberculosis control and care?
9.	Does RNTCP is providing Fixed dose combination/daily regimen to Tuberculosis patients?
10.	Did you know that Incentives will be provided to community pharmacist by RNTCP, if community pharmacist are become DOTS provider?
11.	Did you know that Incentives will be provided to community pharmacist RNTCP, if community pharmacists notify privately treated tuberculosis to RNTCP?
12.	Did you know that Community pharmacist can download NIKSHAY App and can directly notify patients to RNTCP?
13.	Did you know that Community pharmacist can use NIKSHAY app for TB patients management?
14.	Did you know that Provision of Community pharmacist as DOTS provider through RNTCP?

**Table. 3: Attitudes and Practice on National Strategic Plan (2017-25)**

**1. What is primary objective of RNTCP?**

1. To achieve and maintain a TB treatment success rate of at least 85% among new sputum positive (NSP) patients.
2. To achieve and maintain detection of at least 70% of the estimated new sputum positive people in the community.

**2. Which anti-TB drug is contraindicated in pregnancy?**

Streptomycin, Kanamycin, Amikacin

**3. In RNTCP, ACSM stands for**

- A) Advocacy, communication and social mobilization
- B) Revised National TB Control Programme

**4. What is Multi-Drug resistant tuberculosis (MDR-TB)?**

Resistant to treatment with at least two of the most powerful first-line anti-TB medications (drugs), isoniazid and rifampin.

**ANNEXURE – VI - MODIFIED KUPPUSWAMY SES SCALE**  
**(UPDATE FOR FEBRUARY 2019)**

Education of head of family		Score	
Professional degree		7	
Graduate or postgraduate		6	
Intermediate or post high school diploma		5	
High school certificate		4	
Middle school certificate		3	
Primary school certificate		2	
Illiterate		1	
Occupation of head of family			
Professional (white collar)		10	
Semi-professional		6	
Clerical, shop-owner/farm		5	
Skilled worker		4	
Semi-skilled worker		3	
Unskilled worker		2	
Unemployed		1	
Monthly income of family			
In 2001 (Base year)	In 2017 (January 2017 CPI)	In 2019 (February 2019 CPI)	Score
≥15,197	≥41,430	≥52,734	12
7,595-15,196	20,715-41,429	26,355-52,733	10
5,694-7,594	15,536-20,714	19,759-26,354	6
3,793-5,693	10,357-15,535	13,161-19,758	4
2,273-3,792	6,214-10,356	7,887-13,160	3
761-2,272	2,092-6,213	2,641-7,886	2
≤760	≤2,091	≤2,640	1
Socioeconomic class		Total score	
I	Upper	26-29	
II	Upper middle	16-25	
III	Lower middle	11-15	
IV	Upper lower	5-10	
V	Lower	01-04	

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**ANNEXURE – VII – MORISKY 8-ITEM MEDICATION**
**ADHERENCE QUESTIONNAIRES**

**Patient Name:**

**Morisky Medication Adherence Scale (MMAS)**

Please answer each question based on your personal experience with your medications. Note that there is not right or wrong answer. (Please circle your answer below)

- |                                                                                                                                                                                    |                 |     |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|-----|
| 1. Do you sometimes forget to take your medications?                                                                                                                               | NO              | YES |
| 2. People sometimes miss taking their medications for reasons other than forgetting. Thinking over the past two weeks, were there any days when you did not take your medications? | NO              | YES |
| 3. Have you ever cut back or stopped taking your medications without telling your doctor, because you felt worse when you took it?                                                 | NO              | YES |
| 4. When you travel or leave home, do you sometimes forget to bring along your medications?                                                                                         | NO              | YES |
| 5. Did you take your medications yesterday?                                                                                                                                        | NO              | YES |
| 6. When you feel like your health condition is under control, do you sometimes stop taking you medications?                                                                        | NO              | YES |
| 7. Taking medications every day is a real inconvenience for some people. Do you ever feel hassled about sticking to your treatment plan?                                           | NO              | YES |
|                                                                                                                                                                                    | Never/rarely    | 4   |
|                                                                                                                                                                                    | Once in a while | 3   |
|                                                                                                                                                                                    | Sometimes       | 2   |
|                                                                                                                                                                                    | Usually         | 1   |
|                                                                                                                                                                                    | All the time    | 0   |
| 8. How often do you have difficulty remembering to take all your medications?                                                                                                      |                 |     |

**ANNEXURE – VIII – FACIT- SATISFACTION WITH  
PHARMACIST (SWiP)**

Below is a list of statements that other people with your illness have said are important. **Please circle or mark one number per line to indicate your response as it applies to the past 7 days.**

		Not at all	A little bit	Some- what	Quite a bit	Very much
SWiP1	My pharmacist advises me on the proper use of my medicines.....	0	1	2	3	4
SWiP2	My pharmacist advises me on the adverse (side) effects of my medicines .....	0	1	2	3	4
SWiP3	I have confidence in my pharmacist(s) .....	0	1	2	3	4
SWiP4	My pharmacist is available to answer my questions .....	0	1	2	3	4
SWiP5	My pharmacist helps with the arrangements necessary to obtain my medicines .....	0	1	2	3	4
SWiP6	My pharmacist is aware of my treatment-related needs.....	0	1	2	3	4
SWiP7	My pharmacist responds to my treatment-related needs.....	0	1	2	3	4

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**ANNEXURE – IX – HEALTH-SELF-ASSESSMENT-SF-12**
**SF-12® Patient Questionnaire**

Page 1 of 3

**Patient Initials** \_\_\_\_\_ **Date of Birth:** \_\_\_/\_\_\_/\_\_\_ **Patkey:** \_\_\_\_\_

**Surgeon Name:** \_\_\_\_\_ **Date:** \_\_\_\_\_

**Examination Period:** \_\_\_\_\_ Preop (1) \_\_\_\_\_ 3 Year (4)  
 \_\_\_\_\_ Immediate Postop (2) \_\_\_\_\_ 5 Year (5)  
 \_\_\_\_\_ 1 Year (3) \_\_\_\_\_ Other (specify) (6): \_\_\_\_\_
**SF-12®:**

This information will help your doctors keep track of how you feel and how well you are able to do your usual activities. Answer every question by placing a check mark on the line in front of the appropriate answer. It is not specific for arthritis. If you are unsure about how to answer a question, please give the best answer you can and make a written comment beside your answer.

1. In general, would you say your health is:

- Excellent (1)  
 Very Good (2)  
 Good (3)  
 Fair (4)  
 Poor (5)

The following two questions are about activities you might do during a typical day. Does YOUR HEALTH NOW LIMIT YOU in these activities? If so, how much?

2. MODERATE ACTIVITIES, such as moving a table, pushing a vacuum cleaner, bowling, or playing golf:

- Yes, Limited A Lot (1)  
 Yes, Limited A Little (2)  
 No, Not Limited At All (3)

3. Climbing SEVERAL flights of stairs:

- Yes, Limited A Lot (1)  
 Yes, Limited A Little (2)  
 No, Not Limited At All (3)

During the PAST 4 WEEKS have you had any of the following problems with your work or other regular activities AS A RESULT OF YOUR PHYSICAL HEALTH?

4. ACCOMPLISHED LESS than you would like:

- Yes (1)  
 No (2)

5. Were limited in the KIND of work or other activities:

- Yes (1)  
 No (2)

SF-12®

Page 2 of 3

Patient Initials \_\_\_\_\_ Date of Birth: \_\_\_/\_\_\_/\_\_\_ Patkey: \_\_\_\_\_  
Surgeon Name: \_\_\_\_\_ Date: \_\_\_\_\_  
Examination Period: \_\_\_\_\_ Preop (1) \_\_\_\_\_ 3 Year (4)  
\_\_\_\_\_ Immediate Postop (2) \_\_\_\_\_ 5 Year (5)  
\_\_\_\_\_ 1 Year (3) \_\_\_\_\_ Other (specify) (6): \_\_\_\_\_

SF-12® Cont'd:

During the PAST 4 WEEKS, were you limited in the kind of work you do or other regular activities AS RESULT OF ANY EMOTIONAL PROBLEMS (such as feeling depressed or anxious)?

6. ACCOMPLISHED LESS than you would like:

- \_\_\_\_\_ Yes (1)
- \_\_\_\_\_ No (2)

7. Didn't do work or other activities as CAREFULLY as usual:

- \_\_\_\_\_ Yes (1)
- \_\_\_\_\_ No (2)

8. During the PAST 4 WEEKS, how much did PAIN interfere with your normal work (including both work outside the home and housework)?

- \_\_\_\_\_ Not At All (1)
- \_\_\_\_\_ A Little Bit (2)
- \_\_\_\_\_ Moderately (3)
- \_\_\_\_\_ Quite A Bit (4)
- \_\_\_\_\_ Extremely (5)

The next three questions are about how you feel and how things have been DURING THE PAST 4 WEEKS. For each question, please give the one answer that comes closest to the way you have been feeling. How much of the time during the PAST 4 WEEKS –

9. Have you felt calm and peaceful?

- \_\_\_\_\_ All of the Time (1)
- \_\_\_\_\_ Most of the Time (2)
- \_\_\_\_\_ A Good Bit of the Time (3)
- \_\_\_\_\_ Some of the Time (4)
- \_\_\_\_\_ A Little of the Time (5)
- \_\_\_\_\_ None of the Time (6)

SF-12®

Page 3 of 3

Patient Initials \_\_\_\_\_ Date of Birth: \_\_\_/\_\_\_/\_\_\_ Patkey: \_\_\_\_\_

Surgeon Name: \_\_\_\_\_ Date: \_\_\_\_\_

Examination Period: \_\_\_\_\_ Preop (1) \_\_\_\_\_ 3 Year (4)  
\_\_\_\_\_ Immediate Postop (2) \_\_\_\_\_ 5 Year (5)  
\_\_\_\_\_ 1 Year (3) \_\_\_\_\_ Other (specify) (6): \_\_\_\_\_

## SF-12® Cont'd:

10. Did you have a lot of energy?  
\_\_\_\_\_ All of the Time (1)  
\_\_\_\_\_ Most of the Time (2)  
\_\_\_\_\_ A Good Bit of the Time (3)  
\_\_\_\_\_ Some of the Time (4)  
\_\_\_\_\_ A Little of the Time (5)  
\_\_\_\_\_ None of the Time (6)
11. Have you felt downhearted and blue?  
\_\_\_\_\_ All of the Time (1)  
\_\_\_\_\_ Most of the Time (2)  
\_\_\_\_\_ A Good Bit of the Time (3)  
\_\_\_\_\_ Some of the Time (4)  
\_\_\_\_\_ A Little of the Time (5)  
\_\_\_\_\_ None of the Time (6)
12. During the PAST 4 WEEKS, how much of the time has your PHYSICAL HEALTH OR EMOTIONAL PROBLEMS interfered with your social activities (like visiting with friends, relatives, etc.)?  
\_\_\_\_\_ All of the Time (1)  
\_\_\_\_\_ Most of the Time (2)  
\_\_\_\_\_ A Good Bit of the Time (3)  
\_\_\_\_\_ Some of the Time (4)  
\_\_\_\_\_ A Little of the Time (5)  
\_\_\_\_\_ None of the Time (6)

ANNEXURE – X – TB NOTIFICATION REPORTING FORMAT

[PART I—SEC.1]

THE GAZETTE OF INDIA : EXTRAORDINARY

14

**Annexure III TB Notification reporting format for Pharmacy, Chemist & Druggist**

Period of reporting: From ..... To .....

Name of the Reporting (pharmacy) : ..... Telephone (with STD):.....

Mobile number:..... Complete Address:.....

Sr. No.	Name of TB Patient (surname first) *	Father / Husband's name	Age (yrs) <sup>a</sup>	Sex (Male/Female /Transgender) <sup>aa</sup>	Govt issued identification number <sup>b</sup>	Complete residential address	PIN no <sup>c</sup>	Patient Phone number	Date of TB Diagnosis <sup>aa</sup>	Date of TB treatment initiation <sup>aa</sup>	Date of prescription <sup>a</sup>	Date of Dispensing Medicines <sup>a</sup>	Number of Days for which Medicines dispensed <sup>a</sup>	Name of treating medical practitioner (Prescriber) <sup>a</sup>	Address & Registration no. of treating medical practitioner

\* Mandatory \*\* Not mandatory

Signature:..... Date: ...../...../.....



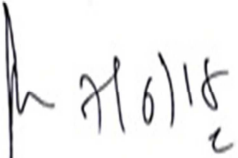
**Annexure-IV**

For each notified patient the prescription details on drugs prescribed and drugs dispensed should be mentioned with dosages, formations and duration

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SARVESH Digitally signed by .....

## ANNEXURE – XI – ETHICAL CLEARANCE LETTER

 <p><b>KLE</b> ACADEMY OF HIGHER EDUCATION AND RESEARCH <small>Empowering Professionals Deemed to be University u/s 3 of the UGC Act, 1956</small></p>	KLE ACADEMY OF HIGHER EDUCATION AND
<p>(Declared as Deemed-to-be-University u/s 3 of the UGC Act, 1956) Accredited 'A' Grade by NAAC (2<sup>nd</sup> Cycle) Placed in Category 'A' by MHRD (Gol) JNMC Campus, Nehru Nagar, Belagavi-590 010, Karnataka State, India ☎: 0831-2444444 FAX: 0831-2493777 Web: <a href="http://www.kledeemeduniversity.edu.in">http://www.kledeemeduniversity.edu.in</a> E-mail: <a href="mailto:info@kledeemeduniversity.edu.in">info@kledeemeduniversity.edu.in</a></p>	
Ref.No.KAHER/Ethic/2018-19/D-129	29 <sup>th</sup> May 2018
<p>To, Dr. Uday Kumar R. Ph.D. Full-Time Research Scholar, 2017-18 Batch, Faculty of Pharmacy, KAHER, Belagavi</p>	
Dear Research Scholar,	
Sub:- Regarding Ethical Clearance.	
<p>The KLE University Ethics Committee on Human Subjects for Ph. D Research Project met on Thursday, 19<sup>th</sup> April 2018 to consider your application for approval of the research project "Evaluate standard practice of availability of anti-Tuberculosis drugs used for DOTS in Tuberculosis patients and its compliance: A Randomized Controlled Study in community pharmacies."</p>	
<p>As there are no ethical issues involved in your proposed research project, the Committee has provided approval for this research project.</p>	
You are requested to report to Ethical Committee in case of the following:	
<ol style="list-style-type: none"> <li>1. Any deviation from or change of the protocol.</li> <li>2. All serious adverse events.</li> <li>3. Any changes in study documents.</li> </ol>	
<p> (Dr. Anita Dalal) Member Secretary, Ph.D. Ethical Committee (Human), KAHER, Belagavi</p>	<p> (Dr. Anil Hogade) Chairman Ph.D. Ethical Committee (Human), KAHER, Belagavi.</p>
<p>CC to: - The Director Academic Affairs, KAHER, Belagavi. - The Director Research Foundation, KAHER, Belagavi. - The Registrar, KAHER, Belagavi</p>	

## ANNEXURE – XII – PUBLICATIONS

J Young Pharm, 2019;11(3):300-303

A multifaceted peer reviewed journal in the field of Pharmacy  
www.jyoungpharm.org | www.phcog.net

Original Article

## Evaluation of Community Pharmacies Dispensing Pattern and Practice of Antituberculosis Drugs in North Karnataka Region

Uday Kumar Rangaswamy\*, Madiwalayya Shivakantayya Ganachari

Department of Pharmacy Practice, KLE College of Pharmacy, KLE Academy of Higher Education and Research, Belagavi, Karnataka, INDIA.

## ABSTRACT

**Objectives:** The study aimed to evaluate the dispensing pattern and practices of community pharmacies towards antituberculosis drugs. **Materials and Methods:** A cross sectional, prospective study was conducted at Belagavi, Karnataka, India based on survey of pharmaceutical outlets in the locality. A structured interview form was used to assess availability and non-availability of Anti-TB drugs, dispensing Anti-TB drugs, Community pharmacist dispensing pattern of Anti-TB drugs in weekly and monthly basis. **Results:** A total of 228 community pharmacists participated in the Survey. Of these, 204 community pharmacists (90.35%) were male and 22 community pharmacists (9.65%) were female. The majority of 198 community pharmacists (86.84%) Diploma in Pharmacy (D. Pharm). 86 community pharmacies (37.72%) were dispensing Anti-TB drugs. The majority (37.04%) of the community pharmacies were expecting to dispense Anti-TB drugs for 2 to 3 tuberculosis patients monthly. Community pharmacies located near Government civil hospital, 108 to 137 tuberculosis patients seeking Anti-TB drugs monthly. 53 community pharmacies (61.62%) dispensing Anti-TB drugs through Private Physicians prescriptions. **Conclusion:** Tuberculosis patients are neglecting where Re-

vised National Tuberculosis Control Programme (RNTCP) facility for free treatment are available. Violation of the guidelines and regulations of dispensing Anti-TB potentially contribute to emergence of drug-resistant *Mycobacterium tuberculosis*. The community pharmacist should be encouraged to participate Directly observed treatment, short course (DOTS) program through RNTCP training.

**Key words:** Community Pharmacies, RNTCP, DOTS, Tuberculosis, Anti-TB drugs.

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## INTRODUCTION

Tuberculosis is a major global public health challenge.<sup>1</sup> Over a quarter of recorded deaths were reported from India, which carries the largest burden of the disease, with increasingly high rates of MDR-TB. Early symptoms of pulmonary TB are vague and persistent, leading infected individuals to seek care from a variety of local primary care providers.<sup>2</sup> The Revised National Tuberculosis Control Program (RNTCP) under the auspices of the Ministry of Health and Family Welfare (MoHFW) of the Government of India had the mandate of prevention and care of TB in the country, including dispensing of medicines through the existing network of government health services. This network included facilities at state, district- and primary-levels, providing TB medicines free of cost. The Central TB Division of the MoHFW is the federal authority responsible for administering the RNTCP at the Centre. The RNTCP officially promulgated the policy of Directly Observed Therapy Short-Course (DOTS), the WHO-recommended global strategy for TB control, in all government facilities and in affiliated private facilities. Whereas a general lack of counseling and support of treatment adherence hampers successful, relapse-free cure.<sup>3</sup> Moreover, most cases treated in the private sector are never notified to public health authorities.<sup>4</sup> Estimating the numbers of patients being treated in the private sector is important since it provides information about the performance of a public system in detecting tuberculosis cases and also helps in planning for government intervention in the private sector.<sup>5</sup> Hence, it is crucial to assess the scale of the problem. This crucially includes the undetected burden that exists outside the public health domain.<sup>6</sup> A study of patient behavior from 13 countries reported that approximately 60% of TB patients begin their care seeking in the private or informal sectors, including pharma-

cies.<sup>7</sup> Pharmacies are highly accessible in India due to their vast numbers (around 800,000 nationally),<sup>8</sup> long opening hours and absence of user fees. For many patients, pharmacies may be their first point of contact, where most drugs, including antibiotics, can be purchased Over-the-counter (OTC).<sup>9</sup> Management of the patients was benchmarked against guidelines for pharmacists from the Government of India and the Indian Pharmaceutical Association.<sup>10</sup> In this study, we evaluate the dispensing pattern and practices of community pharmacies towards antituberculosis drugs to understand the current trend of Pharmacy practice.

## MATERIALS AND METHODS

The study was conducted at Belagavi city, Karnataka, India on 228 pharmaceutical outlets. A structured interview form was used to assess availability and non-availability of Anti-TB drugs, Community pharmacist dispensing pattern of Anti-TB drugs in weekly and monthly basis. In person interviews were administered after obtaining a written consent.

## Ethical Considerations

This project was approved by KLE University Ethics committee on human subjects, KLE Academy of higher education and research, deemed to be university, Belagavi, Karnataka state, India, (Ref No. KAHER/Ethics/2018-19/D-129). Survey consent was taken from each community pharmacist of the shop about the study participants, voluntary involvement and confidentiality. The community pharmacists were asked to sign and seal/stamp in both survey consent form and structured questionnaires.

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### Study Design and Study Settings

A Cross sectional study was conducted in Belagavi city, Karnataka state, India, during June 2018 to April 2019. All the registered pharmaceutical outlets in Belagavi district were included for the study. Pharmacies dealing as wholesale distributors or attached with hospital were excluded from the study. Community pharmacist information leaflet were distributed in regional language Kannada and English. The community pharmacist information leaflet includes the study objectives, role of community pharmacist in tuberculosis control and care, burden of tuberculosis in India and in district.

### Study Setting and Participants

The study was implemented in Belagavi, Karnataka, India with a population of approximately 5 lakhs residents. The study population encompassed registered community pharmacy outlets.

### Date Collection and Data Analysis

The survey included the community pharmacy details. All the data obtained was tabulated using Microsoft Excel (Microsoft Corporation, CA, USA). Descriptive Statistics was performed for all the data collected using the R statistics package 3.5.2 (R Project for statistical computing, Vienna, Austria).

### Study Sample Selection

A total of 228 Pharmacy shops were surveyed. Drug distributors, non-availability of qualified pharmacist on the time of survey, In-house hospital pharmacy shops are excluded from the study. Only qualified pharmacist or registered pharmacist at the time of survey has been included in the study (Figure 1).

### Instruments and Instrumentation

A self-designed questionnaire was pre-tested through piloting among 20 randomly selected pharmacies, including those located in urban areas. Pilot questionnaire feedback was used to modify for educational background and dispensing practices regarding dispensing pattern of Anti-

TB drugs. The modified questionnaire were distributed to the sample population. This study was carried out during pharmacy working h and the study was conducted under the close supervision of the researcher.

## RESULTS

A total of 228 community pharmacists participated in the survey by providing answers to all relevant questions. Of these, 204 community pharmacists (90.35%) were male and 22 community pharmacists (9.65%) were female. The majority of 198 community pharmacist (86.84%) possessed a Diploma in Pharmacy (D. Pharm) followed by 12 community pharmacist (5.26 %) with Bachelor of Pharmacy (B. Pharm) degree, 3 community pharmacist (1.32%) with Master of Pharmacy (M. Pharm) which is summarized in (Table 1).

86 community pharmacies (37.72%) were dispensing Anti-TB drugs, 131 community pharmacies reported (57.46%) non availability of Anti-TB drugs, 9 community pharmacies (3.94%) reported having dispensed Anti-TB drugs but stopped because of non-availability of tuberculosis patients and 2 community pharmacies (0.88%) had stopped dispensing of Anti-TB drugs and the tuberculosis patients were notified to District RNTCP by community pharmacist (Figure 2).

54 community pharmacies were expecting 136 to 181 tuberculosis patients to purchase Anti-TB drugs in a month. The majority (37.04%) of the community pharmacies dispensing 2 to 3 tuberculosis Patients Anti-Tb drugs monthly. We observed that seven (12.96%) community pharmacies were located in proximity to Government civil hospital, which estimated 108 to 137 tuberculosis patients seeking Anti-TB drugs monthly (Table 2). Six community pharmacies were expecting 35 to 57 tuberculosis patients to purchase Anti-TB drugs per week. Two community pharmacies dispensing Anti-TB drugs (33.33%), which received 2 to 3 tuberculosis patients per week (Table 3). Four community Pharmacies (66.67%) were dispensing anti-TB drugs, which received 33 to 54 tuberculosis patients per week. Remaining 26 community pharmacist did not provide an estimate for the number of tuberculosis patients at the time of interview.

**Table 1: Details of Distribution of Gender Pharmacist, Community Pharmacies and Qualification of community pharmacist.**

Details of community Pharmacies	Number	%
<b>Gender Distribution</b>		
Male	206	90.35
Female	22	9.65
Total	228	100
<b>Others</b>		
Drug Distributors/ Wholesale shop	180	78.95
Non availability of Qualified Pharmacist	80	35.09
In-house hospital Pharmacies	15	6.58
<b>Qualifications</b>		
B. Pharm	12	5.26
D. Pharm	198	86.84
D. Pharm with other degree	15	6.58
M. Pharm	3	1.32
<b>Total</b>	<b>228</b>	<b>100.00</b>

**Table 2: Community Pharmacist dispensing Anti-TB drugs on monthly basis.**

Sl. No	Number of Tuberculosis patients	Number of Community Pharmacies	%
1	1 to 2 Patients	8	14.81
2	2 to 3 Patients	20	37.04
3	3 to 4 Patients	7	12.96
4	3 to 5 Patients	2	3.70
5	4 to 5 Patients	4	7.41
6	5 to 10 Patients	3	5.56
7	10 to 15 Patients	3	5.56
8	10 to 20 Patients	1	
9	15 to 20 Patients	1	
10	20 to 25 Patients	1	
11	50 to 55 Patients	1	
12	5 to 6 Patients	1	
13	6 to 7 Patients	1	
14	2 to 4 Patients	1	12.96
<b>Total</b>	<b>136 to 181 Patients</b>	<b>54</b>	<b>100.00</b>

**Table 3: Community Pharmacist dispensing Anti-TB drugs on weekly basis.**

Sl. No	Number of Tuberculosis patients	Number of Community Pharmacies	%
1	2-3 Patients	2	33.33
2	3-4 Patients	1	
3	5-10 Patients	1	
4	10-20 Patients	1	
5	15-20 Patients	1	66.67
<b>Total</b>	<b>35-57 Patients</b>	<b>6</b>	<b>100.00</b>

Remaining 26 Community Pharmacist have no idea of dispensing Anti-TB drugs.

**Table 4: Dispensing pattern of Anti-TB drugs.**

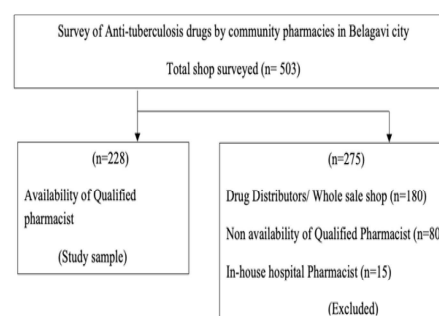
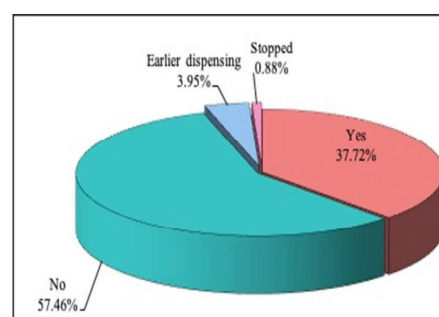
Dispensing Pattern of Anti-TB drugs	No.	%
Government Physician	5	5.82
Private Physician	53	61.62
Both Government Physician and private Physician	8	9.30
No idea on dispensing pattern	20	23.26
<b>Total</b>	<b>86</b>	<b>100.00</b>

We observed an interesting dispensing pattern of Anti-TB drugs 53 community pharmacist were (61.62%) dispensing Anti-TB drugs based on prescription of Private Physicians. 5 community pharmacies (5.82%) dispensing Anti-TB drugs based on prescription of Government Physicians. 8 Community pharmacies (9.30%) were dispensing Anti-TB drugs through both Private and Government physicians, remaining 20 community Pharmacies (23.26%) had no idea of dispensing pattern of Anti-TB drugs. (Table 4)

## DISCUSSION

The study assumes significance by the principle that DOTS service through RNTCP for TB is made available to the public by the Government free of charge, which includes free diagnostics and nutritional supports to the patients. This is particularly important as India is aiming to achieve 'Universal Access' for quality assured diagnosis and treatment under RNTCP.<sup>11</sup> Further, the emergence of multi-drug resistant TB is posing a serious threat to the effective control of the disease in India. In this context, community pharmacies have a big role to play.

In summary, this study assessed 228 community pharmacies for their availability and dispensing pattern of Anti-TB drugs. It was observed that 37.52% of the community pharmacies were dispensing Anti-TB drugs. This indicates that TB patients are not sufficiently aware of the free treatment provided by the RNTCP and are hence relying on drugs available through community pharmacies. This reflects on the financial burden that the TB patient bears when purchasing drugs from community pharmacies thereby contributing to a major reason for the discontinuation of treatment of TB patients, before the full course of treatment

**Figure 1: Sample Size selection across Belagavi city.****Figure 2: Availability and non-availability of Anti-TB drugs.**

regimen is completed, as major community pharmacies do not maintain follow up records. It may lead to drug-resistant TB. This understanding is significantly relevant in context with the Indian Pharmaceutical Association (IPA) continued efforts to integrate community pharmacies with the RNTCP-DOTS program. Prohibiting the guidelines and regulations of dispensing of antibiotics, including Anti-TB medicines, without prescription should be enforced to prevent further development of drug-resistance TB.

Community pharmacists have not been engaged in national policy discussions around TB control. However, recent years have seen some progress in this area culminating in the memorandum of understanding between the Central TB Division and the Indian Pharmaceutical Association, the All India Organization of Chemists and Druggists, the Pharmacy Council of India and the SEAR Pharm forum to "engage pharmacist's in RNTCP for TB Care and Control in India". Over the past decade, there have been projects focused on engaging pharmacists in India.<sup>10</sup> But such Public-Private Mix (PPM) partnerships are yet to reach desired scale.<sup>12</sup>

## CONCLUSION

The efforts of the RNTCP the DOTS programs can be effective only if the private sector stakeholders, especially community pharmacies, are involved in the National Strategic Plan (NSP) 2017 – 2025 to achieve a rapid decline in the burden of TB, mortality and morbidity, while working towards the elimination of TB in India by 2025. Furthermore, the public and tuberculosis patients should be made more aware of the free DOTS treatment facility provided by RNTCP.

## ACKNOWLEDGEMENT

We would like to acknowledge VC, KAHER for allowing me to carry out the study. Authors also acknowledge community pharmacists who are involved in this study.

## CONFLICT OF INTEREST

The authors declare no conflict of interest.

## ABBREVIATIONS

**TB:** Tuberculosis; **MDR-TB:** Multidrug-resistant Tuberculosis; **WHO:** World Health Organization; **RNTCP:** Revised national tuberculosis control program; **DOTS:** Directly Observed Treatment, Short Course; **MoHFW:** Ministry of Health and Family Welfare; **OTC:** Over the counter; **IPA:** Indian Pharmaceutical Association; **PPM:** Public Private Mix; **NSP:** National Strategic Plan.

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## Original Article

## Contribution of Community Pharmacy in Treating Tuberculosis: A Pharmacy Centric Study from Belagavi District

### Abstract

**Introduction:** Tuberculosis (TB) is an important global health problem, which is aimed to be eradicated by 2025 from India. Community pharmacists play a significant role in treating and eradication of TB. This study aimed to understand the contribution of community pharmacy and their potential role in RNTCP (Revised National TB Control Programme) functioning. **Materials and Methods:** The study was conducted at Belagavi, Karnataka, India on 312 community pharmacies. A structured interview form was used to assess several factors such as education, knowledge, anti-TB drug dispensing patterns, willingness to be trained, and become a DOTS (Directly Observed Treatment Short course) provider. **Results:** On an overall scale, we found that the majority of licensed community pharmacy was managed by D. Pharm holders with a limited knowledge of TB. It was also noted that there was a lack of willingness to be rigorously trained for updating their knowledge, although they were interested in being trained for being recognized as a DOTS center. **Conclusion:** There is a strong need for strengthening community pharmacy services in tune with RNTCP to achieve better efficiency in treating and eradication of TB.

**Keywords:** Community pharmacy, DOTS, RNTCP, tuberculosis

### Introduction

Tuberculosis (TB) caused by *Mycobacterium tuberculosis* is one of the leading global focus of infectious disease.<sup>[1]</sup> As per the statistics by the World Health Organization in the year 2017, the incidence of TB was approximately 10 million people with a mortality of 1.6 million. India accounts for 27% of the incidence and 29% of the mortality. The Government of India (GOI) has attempted to control TB for the past five decades with significant advances.<sup>[2]</sup> More recently, GOI has declared TB as one of the infections of national interest and planned to eliminate TB before 2025.<sup>[3]</sup>

There are several factors that play a potential role in control and elimination of TB. This includes but not limited to factors such as quality of socioeconomic status, primary health care, cooperative efforts by national programs, public awareness, support from the pharmaceutical industry, and funding for research. RNTCP (Revised National TB Control Programme), which is the national program of India, aimed at controlling and elimination of TB was reported to be not fully effective.<sup>[4]</sup> In this view, public awareness and role of pharmacy has been suggested to

be highly important in controlling TB over a long term.<sup>[5-11]</sup>

India has an estimated 850,000 retail drug outlets. Through a public-private partnership with various entities, approximately 9% of the outlets ( $n = 75,000$ ) in 12 selected districts across four states of India were engaged over a 4-year period and accounted for nearly one-third of India's 1.2 billion people and one-third of its smear-positive TB cases.<sup>[12,13]</sup>

As in a majority of scenarios, pharmacies serve as the first and sometimes as the sole point of contact for TB cases, it is important to understand the knowledge and capabilities of pharmacy especially in rural areas. With this view, we initiated this study with the primary objective of evaluating standard pharmacy practices, knowledge, and availability of anti-TB drugs used for DOTS (Directly Observed Treatment Short course) in TB patients and engaging community pharmacists to understand their relevance in fulfilling the RNTCP objectives. Currently not much-implemented pharmacy curriculum related to TB continuing pharmacy education (CPE) in India.

The rationale behind this study is to analyze how many community pharmacies dispensing anti-TB drugs, to assess knowledge of TB, to assess dispensing pattern of anti-TB drugs,

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whether community pharmacist upgrade their knowledge by CPE, and to recognize DOTS center.

## Materials and Methods

### Study setting and participants

The study was implemented in Belagavi, Karnataka, India with a population of approximately 5 lakh residents. The study population encompassed registered pharmacies, with the availability of anti-TB drugs and consenting to be part of RNTCP. A total of 350 pharmaceutical outlets were identified, of which 312 pharmacies were community pharmacies. A brief schematic summary of the overall methodology of the study is represented in Figure 1. At each pharmacy, an assigned interviewer explained the study to the pharmacy worker. At each pharmacy, an assigned interviewer explained the study to the community pharmacist. A structured questionnaire was used for assessment which was designed based on a previous pilot study. The questionnaire was answered independently by the practicing community pharmacist.

### Questionnaire design

Community pharmacy details include name of the pharmacy, address of the pharmacy, details of qualified pharmacists, qualification of community pharmacists, dispensing of anti-TB drugs, are community pharmacists interested in CPE?, the knowledge of community pharmacists like know about TB, is TB is a communicable disease?, symptoms of TB, planning to keep anti-TB drugs, how the anti-TB drugs are dispensed like through government physician prescription, private physician prescription, or both, or don't know?, and are community pharmacists interested to become DOTS provider?.

### Ethical statement

The study was approved by the KLE University ethics committee through letter number KAHER/Ethics/2019-19/D-129. An informed consent from the pharmacy worker was obtained to be included in the study.

### Data collection and analysis

The data collected were based on a previously agreed data points by the authors of this study. This included demographics, accessibility of the pharmacy for anti-TB drugs, university certification, knowledge on TB, interest in being educated about TB, and willingness to be part of RNTCP. All the data obtained were tabulated using Microsoft Excel and percentage of distribution of various data points was performed for all the data collected (Microsoft Corporation, California). Descriptive statistical analysis was performed using R Statistics package 3.5.3 (The R Project for Statistical Computing).

## Results

A total of 312 were community pharmacies were surveyed for this study. The pharmacy practitioners were educated in pharmacy practice with 95.8% of them holding a diploma degree, 3.84% with Bachelor's degrees, and 0.32% with

Master's degrees. On interview, 46.4% expressed an interest in being educated on pharmacy practices. 53.5% of the practitioners showed a negative interest in being educated and updated citing lack of time. On specifically questioning about knowledge on TB, a majority of the practitioner (>99%) indicated that they had a working knowledge of TB. However, only 87.8% of the workers knew about symptoms of TB, 10.2% had a partial understanding, and 1.9% of them were unaware of the symptoms [Figure 2].

In India, community pharmacists require revision and update knowledge of TB and anti-TB drugs, for example, get introduced to global and Indian TB scenario, understand basics of TB and drug-resistant TB, understand the principles and strategy of RNTCP and DOTS, understand role of pharmacist in generating community awareness on TB, identification, and referral of TB suspects, DOT provision, recording and reporting, and rational use of anti-TB drugs.

A total of 87 community pharmacies had working dispensable stock of first-line anti-TB drugs. Among the pharmacy counters that did not possess a dispensable stock of first-line anti-TB drugs ( $n = 225$ ), 52.88% of the community pharmacist indicated that they are interested in storing anti-TB drugs in the future. Further, all the community pharmacist dispensing anti-TB drugs knew that TB was a communicable disease and 88.5% of them had a knowledge on TB clinical symptoms. We observed that there was no statistically significant difference in this knowledge between the community pharmacist currently dispensing anti-TB drugs and nondispensing anti-TB drugs ( $\chi^2 = 0.053$ ;  $P = 0.97$ ) [Figure 3]. Further, of the 87 community pharmacy which dispensed anti-TB drugs only one pharmacy was part of RNTCP and kept records of the patient. For all other counters, there was no record of TB patients or follow-up data.

Among the 87 community pharmacies dispensing anti-TB drugs (T. AKuriT-4 and T. AKuriT-3), 33 pharmacies declared they dispense drugs based on a valid prescription and two pharmacies indicated dispensing anti-TB drugs irrespective of prescription. The remaining 52 pharmacies did not indicate any information [Figure 4]. Further, 24/87 (27.58%) community pharmacies dispensing anti-TB drugs indicated an interest in

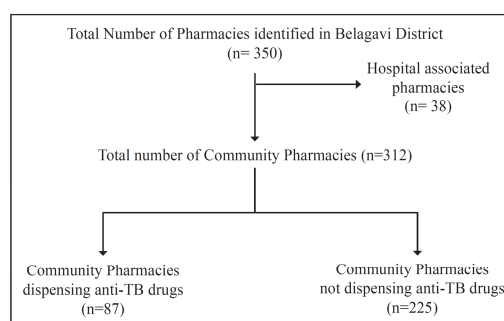


Figure 1: A brief schematic summary of the overall methodology of the study

being part of a recognized DOTS center. Similarly, 60/225 (26.66%) community pharmacies not storing or dispensing anti-TB drugs indicated an interest in being part of a recognized DOTS center [Figure 5].

### Discussion

TB is primarily a respiratory infection which could be clinically treated using anti-TB drugs.<sup>[14]</sup> Despite being a significant public health problem, a substantial population are not aware of TB and display non-compliance to therapy.<sup>[7]</sup> Hence, the role of community pharmacies is indispensable in educating the patients about TB. However, the effectiveness of community pharmacies in acting against TB has not been well documented.

In India, practicing pharmacists are required to hold a minimum of a diploma degree and possess basic clinical and pharmaceutical understanding. In our study, a majority of the community pharmacist possessed a D. Pharm (Diploma in Pharmacy), followed by B. Pharm (Bachelor of Pharmacy) degree and M. Pharm (Master of Pharmacy) degree. It has been previously noted that most diploma holders have a minimal working clinical knowledge and rarely undergo additional training.<sup>[13]</sup> In concurrence, we find that there is an overwhelmingly inadequate training in pharmacy practice which potentially hinders combating TB at a community level. Similar findings have also been reported by Ou *et al.*<sup>[16]</sup> This lacunae in training has a higher impact as less than 50% of

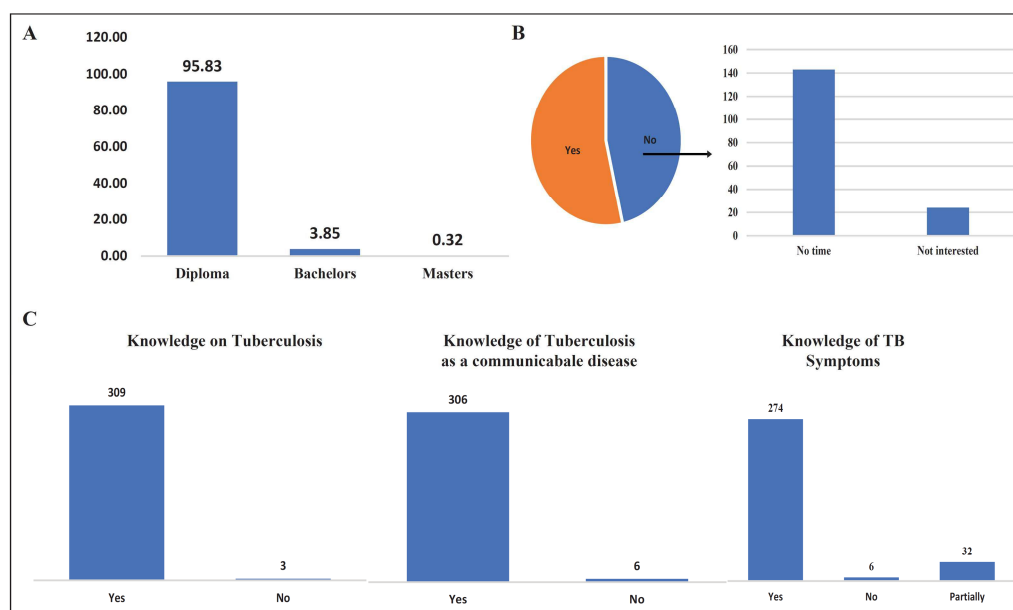


Figure 2: (A) Education qualification. (B) Interested on continuing pharmacy education. (C) Knowledge on tuberculosis

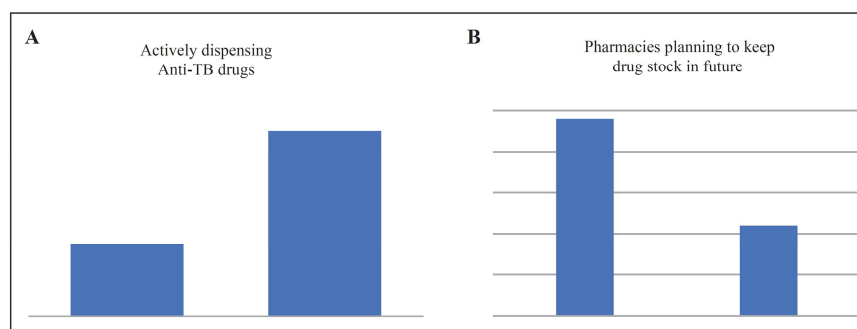


Figure 3: (A) Actively dispensing anti-TB drugs. (B) Pharmacies planning to keep anti-TB drugs in future

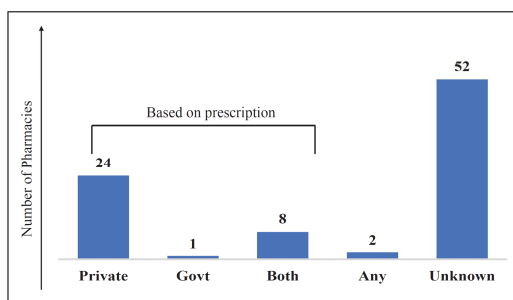


Figure 4: Dispensing anti-TB drugs based on prescription

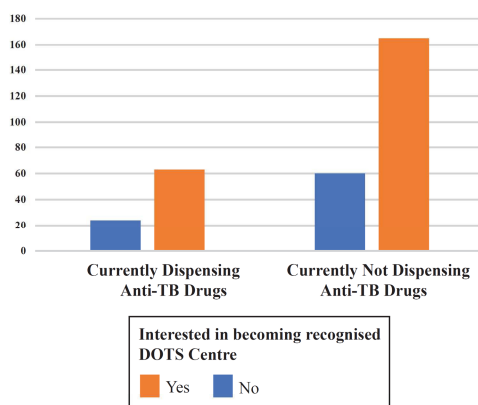


Figure 5: Dispensing anti-TB drugs and interested to become DOTS provider

the total community pharmacist expressed any interest in being trained and further educated. In this study, a lack of willingness to be educated was primarily cited due to a lack of time during business hours which could also be indirectly due to any positive incentives to be trained. Though we have not thoroughly investigated the breadth of practicing pharmacist's knowledge with reference to the TB, there was a working knowledge of transmission of disease. Nevertheless, there was a lack of understanding of TB symptomatology in the practitioners, even with those who were routinely dispensing anti-TB drugs. This indicates that there is a significant need to improvise training and knowledge of TB as noted previously.<sup>[17,18]</sup>

Retail pharmacies form a significant component of the RNTCP.<sup>[19]</sup> Accounting for the significant contribution offered by the privately owned pharmacies, RNTCP aims to involve them through public-private mix (PPM) strategy.<sup>[19]</sup> In context, we observed that only 27.8% of the pharmacies dispensed anti-TB drugs with only one among them as a recognized as RNTCP store. Further, we cannot assess the quality of practice as there were no well-documented records of anti-TB drug dispensing statistics, follow-up or patient records. Hence, the possible potential effect of PPM strategy could not be realized.

In a study reported by Konduri *et al.*,<sup>[20]</sup> the authors reported a detailed analysis indicating that though community pharmacies are an important component of TB health-care program, they have not been used, trained, and empowered as a primary point of contact. This was reflected in our study, showing that there was only one pharmacy involved with RNTCP, though a significant interest was shown by many more outlets in being a part of RNTCP by involving as a DOTS provider.

As already noted, the privately owned pharmacies function as first point of contact for several symptomatic patients with respiratory illness, to seek medical care and purchase medicines over the counter. Though theoretically, the role of pharmacists is to direct such cases to a qualified clinician, and not provide over the counter antibiotics such practice is violated in the field due to its negative effects on the business. In context, we noted that two community pharmacists agreed to providing over the counter anti-TB medication. Further, 60% of the pharmacies did not declare if they dispense anti-TB drugs based on physician prescription, which is most likely to be the case. This was probably not declared owing to the knowledge that such practice is not allowed, though the pharmacy still continues to do so to avoid loss of profit in the business.

## Conclusion

The community pharmacists through the PPM strategy form an integral part of the RNTCP. Though they form an important and in a few instances the only point of contact for several TB cases, their potential has not been fully used. It is also identified that there is a lack of sufficient training and knowledge in the awareness about TB. We identify there is a significant need to educate and enable more community pharmacists' and enroll them as DOTS providers which may significantly enhance the TB control programs in the country.

## Financial support and sponsorship

Nil.

## Conflicts of interest

There are no conflicts of interest.

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ANNEXURE – XIII – CERTIFICATES OF ORAL &  
POSTER PRESENTATION

  
  
**73rd NATCON**  
73rd National Conference of Tuberculosis and Chest Diseases  
January 4th - 6th, 2019  
Nagpur

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**Certificate of Participation**

This is to certify that

*Dr. Uday Kumar R*

has presented **Poster** on


Community Pharmacists As Dots Provider: A Survey Of Community  
Pharmacists Willingness To Continuing Pharmacy Education On Tuberculosis


during the **"73rd NATCON"**, **73rd National Conference of Tuberculosis and Chest Diseases**  
held between 5th - 6th January 2019 at Hotel Centre Point, Ramdaspath, Nagpur

  
**Dr. Radha Munje**  
Org. Chairperson  
NATCON 2019


  
**Dr. Sushant Meshram**  
Scientific Committee  
Chairman




  
**Dr. Ravindra Sarmaik**  
Org. Secretary  
NATCON 2019





**KLE**  
 EMPOWERING PROFESSIONALS





 50  
 1968 - 2018




**KLE COLLEGE OF PHARMACY, BELAGAVI**  
 A Constituent Unit of KLE Academy of Higher Education & Research  
 (Deemed-To-Be-University)





**KLES**  
 KLE PHARMACEUTICALS INSTITUTE  
 MEDICAL RESEARCH CENTRE  
 BELAGAVI, BELAGAVI

**1<sup>st</sup> NATIONAL PHARM.D COLLOQUIUM (NPC-2019)**  
 CONTENTS TO CONTEXT

**Certificate**

THIS IS TO CERTIFY THAT

Dr/Mr/Miss/Mrs. / Uday. Kumar. R.

of KLE COP Bom. has Participated in Oral Presentation

competition & secured 5 Prize in 1<sup>st</sup> NATIONAL PHARM.D COLLOQUIUM (NPC-2019)

organized by Dept. Of pharmacy Practice, KLE College of Pharmacy, Belagavi on 8<sup>th</sup> & 9<sup>th</sup> March 2019.

Prof. (Dr). M.S. Ganachari  
 Convener

Prof. (Dr). B.M. Patil  
 Principal

MASTER CHART

Qualified pharmacist	KLE alumni	Continuing pharmacy education	Storing of Anti-tb	Patients per month	Per week	years of dispensing Anti-tb	Part of RNTCP	Data maintaining	Follow the patients	Interested recognize as DOTS centre	Prescription
D.paharm		Not interested	Yes	3 to 5		5 years	No	No	No	No	Private, Physician and Selfmedication
D.paharm		Not interested	Yes				No	No	No		
D.paharm		Not interested	Yes				No	No	No		
D.pharm	KLE alumni/Nippani	Agreed to come for training	No				No	No	No		
D.paharm		Not interested	Yes	10			No	No	No		
D.paharm	KLE alumni	interested	Yes	10to 15			No	No	No	No	private
D.paharm		not interested	Yes	50-55		since establish	No	No	No	No	govt and private
D.paharm		interested/ Agreed to come for training	Yes	3 to4		2 to 3 years	No	No	No		Private Physician
D.Pharm		Not interested	No				No	No	No		
D.pharm	KLE Alumni	Agreed to come for training	Yes	5 to 10		4	No	No	No		
D.paharm		Not interested	Stopped				No	No	No		Private Physician
D.paharm		interested/ Agreed to come for training	Yes	1 to 2		12 years	No	No	No		
B.Pharm		interested/ Agreed to come for training	Yes			17	No	No	No		All (private, govt, self medication)
D.paharm, B.Sc		Not interested	Yes		3 to 4	15 years	No	No	No		Private
D. pharm		need to contact /qp not avialable	Yes	2 to 3		30	No	No	No		
D. pharm, B.Sc		Need to contact	No				No	No	No		
D.paharm		not interested	No				No	No	No		
D.paharm		Not interested	No				No	No	No	Yes	
D. Pharm	KLE Alumni	agreed to come for training	Yes	10			No	No	No		
D.pharm, Degree		Not interested	stopped the shop				No	No	No	Yes	
D. Pharm		interested/ Agreed to come for training	No				No	No	No		private physician
D.pharm, Degree		Not interested	Yes	20		30 years	No	No	No	No	
B.Pharm		Not interested	No				No	yes	No	Yes	private physician
D.pharm	KLE alumni	Interested	Yes	15-20			No	No	No	Yes	private physician
B.Pharm	KLE alumni	interested/ Agreed to come for training	Yes	4 to 5		7	No	No	No	Yes	private physician and self medication
D. Pharm		Not interested	Yes	2 to 3		1	No	No	No	Yes	
pucc		agreed to come for training	no				No	No	No		
D. Pharm		agreed to come for training	no				No	No	No	Yes	govt and private
D. Pharm		agreed to come for training	Yes	5 to 10		30	No	No	No		
D. Pharm		Not interested	yes				No	No	No		
D. Pharm		Not interested	No				No	No	No		Govt and private
D.pharm		Not interested	Yes	rare			No	No	No		
D.paharm		Not interested	No	earlier			No	No	No		
D. Pharm		Not interested	No				No	No	No	Yes	
D. Pharm		agreed to come for training	Yes		2 to 3	18	No	No	No	Yes	
B.Pharm	KLE alumni	agreed to come for training	No				No	No	No		Private
D. Pharm		agreed to come for training	Yes	10 TO 15		2 YEARS	No	No	No		Govt
D.pharm		agreed to come for training	Yes	DON'T KNOW		5 TO 6 years	No	No	No		govt and private
D. Pharm		Not interested	Yes	2 to 3		25	No	No	No	Yes	Private
D. Pharm		agreed to come for training	Yes	2		25	No	No	No		All (private, govt, self medication)
D. Pharm		agreed to come for training	Yes	3 to 4		6	No	No	No		
D. Pharm	KLE alumni	agreed to come for training	Earlier dispensing				No	No	No		
D. Pharm		Don't have time	No				No	No	No	Yes	private
D. Pharm		agreed to come for training	Yes	3 to 4		6	No	No	No		
D. Pharm		Don't have time	No				No	No	No	Yes	Private
D.pharm		Don't have time	Yes	3 to 4		10	No	No	No	Yes	
D.pharm	KLE Alumni	Agreed to come for training	No				No	No	No	Yes	
D.pharm, M.Pharm	KLE Employee	Don't have time	No				No	No	No	Yes	
D.Pharm		Interested/ Agreed to come for training	No				No	No	No	Yes	Govt and private
D. Pharm	KLE alumni	agreed to come for training	Yes	2		6	No	No	No		All ( Govt., Private, Self medication)
D.pharm	KLE Alumni	Agreed to come for training	No				No	No	No	Yes	
D.paharm		Don't have time	No				No	No	No		
D.pharm		Don't have time	No				No	No	No		
D. Pharm	KLE alumni	agreed to come for training	Yes	5 to 6		15	No	No	No		Private
D. Pharm		Not interested	Yes	2		7	No	No	No		Private
D. Pharm		Not interested	Yes	2 to 3			No	No	No		
D. Pharm		Not interested	No				No	No	No	Yes	
D. Pharm		agreed to come for training	Yes	10		25	No	No	No		
D. Pharm		Need to contact	Yes	2 to 3		37	No	No	No		private and self medication
D. Pharm		Homeopathy/ Agreed to come	Yes	10 to 20		25	No	No	No		all ( Govt., Private, Self medication)
D. Pharm		Need to contact qp	Yes			6	No	No	No		Private
D. Pharm		Need to contact qp	Yes		10	35	No	No	No	Yes	
B. COM		agreed to come for training	No				No	No	No		Govt and private
D. Pharm		Not interested/ Busy	Yes	10 to 15		15	No	No	No		
D.paharm		Not interested	No				No	No	No		private
D.Pharm		Need to contact qp	Yes	1 to 2		12	No	No	No		Private
D.pharm		Agreed to come for training	Yes	3 to 5			No	No	No		
D.paharm		busy/not interested	No				No	No	No	Yes	
D. Pharm	KLE alumni	agreed to come for training	No				No	No	No	Yes	
D. Pharm		agreed to come for training	No				No	No	No	No	
D. Pharm	KLE alumni	Not interested	No				No	No	No		Private
D. Pharm	KLE alumni/Nippani/His wife	agreed to come for training	Yes	2			No	No	No		
D. Pharm, B. Tech	KLE alumni/his wife	agreed to come for training	No				No	No	No	Yes	Private
D. Pharm	KLE alumni	need to contact one more time	Yes	2 to 3			No	No	No		
D. pharm		Need to contact qp	No				No	No	No		
D.paharm		Not interested/ qp not available	No				No	No	No		Private
D.paharm		qp not available/busy	No				No	No	No		
D. pharm		Need to contact	Yes	3 to 4			No	No	No		Private
D. Pharm		Need to contact/qp not available	Earlier dispensing				No	No	No	Yes	
D.pharm		Need to contact/qp not available	No				No	No	No		
D.paharm	KLE Alumni	Not interested	No				No	No	No	Yes	
D. pharm/ BE		interested/ Agreed to come for training/general secretary	Earlier dispensing				No	No	No	Yes	
D. Pharm		Interested/ agreed to come for training	No				No	No	No		
D.paharm		not interested	No				No	No	No	Yes	
B. Pharm		agreed to come for training	No				No	No	No	Yes	
D. Pharm		Not interested	No				No	No	No		
D. Pharm		agreed to come for training/ working in KLE hospital	No				No	No	No		
D.pharm		Not interested	Yes	rare			No	No	No	No	
D.paharm		Not interested	No				No	No	No		Private
D.paharm		Not interested	Yes	2 to 3		2	No	No	No		
D.pharm		Not interested	Yes	2			No	No	No		Private
D.paharm		Not interested	No				No	No	No		
D.pharm	KLE alumni	Agreed/ khan pharmacist kle alumni	Yes	1			No	No	No		
D.pharm		Not interested	Yes				No	No	No		

B.pharm		Not interested	Yes		2		No	No	No		
D. Pharm		Very interested/agreed to come	No				No	No	No	Yes	
D.paharm		Not interested	No				No	No	No	Yes	Govt
D.Pharm		Not interested	Yes	rare			No	No	No		
D.Pharm		Not interested	No				No	No	No	Yes	
D. Pharm		Interested/ agreed to come for the training	No				No	No	No		
D. Pharm	KLE Alumni	agreed to come for the training	No				No	No	No		
D. Pharm		Need to contact qp	No				No	No	No	Yes	Private
D. Pharm	KLE Alumni	Agreed to come for training	Yes	1 to 2			No	No	No	Yes	
D. Pharm	KLE Alumni	Interested/ agreed to come for the training	No				No	No	No		
D.paharm		Don't have time	No				No	No	No		
D.paharm		Don't have time	No				No	No	No		Private
D. Pharm	KLE Alumni	Don't have time	Yes	2 to 3			No	No	No		
D. Pharm	KLE Alumni	Don't have time	Earlier dispensing				No	No	No		Govt and private
D. Pharm		Agreed to come for training	Yes	1 to 2		Since establish	Yes (But discontinued)	Yes	Yes	DOTS (Discontinued by patient)	
D. Pharm	KLE Alumni	Not interested	Yes	1			No	No	No	Yes	
D. Pharm		Agreed to come with qp	No				No	No	No		
D. Pharm		Not interested	No				No	No	No	Yes	All (Private, Govt.,Self medication)
D. Pharm	KLE Alumni	Interested/ Agreed to come for training	Yes	2 to 3		8	No	No	No		
D.paharm		Not interested	Yes	4 to 5			No	No	No		private
D. Pharm	KLE Alumni	Agreed to come for training	Yes	2 to 3		since establish	No	No	No		
D.pharm		Not interested	No				No	No	No	Yes	Private
D. Pharm		Agreed to come for training	Yes	2		since establish	No	No	No		
D. Pharm		Not interested	No				No	No	No		
D. Pharm		Not interested	No				No	No	No	Yes	
D. Pharm	KLE Alumni	Interested/agreed to come for training	No				No	No	No		
D.Pharm		Don't have time	No				No	No	No	Yes	
D. Pharm		Interested/ agreed to come for training	No				No	No	No		
D.paharm		Don't have time	No				No	No	No		
D. Pharm		need to contact qp/ agreed to come for training	No				No	No	No	Yes	
D.Pharm	KLE Alumni	Interested/ agreed to come for training	No				No	No	No	Yes	
D.pharm		Agred to come for training	No				No	No	No	Yes	
D.paharm		Interested	No				No	No	No		
D.pharm	KLE Alumni	Need to contact qp	No				No	No	No	Yes	
D. Pharm		Don't have time	No				No	No	No		Private
D. Pharm	KLE Alumni	agreed to come for training	Yes	4 to 5		4	No	No	No		
D.pharm		Don't have time	No				No	No	No	Yes	
D.pharm		Interested/ agreed to come for training	No				No	No	No		
D.pharm		Don't have time	No				No	No	No		private
D.pharm		Don't have time	No				No	No	No		
D.pharm		Agreed to come for training	Yes	1		26	No	No	No	Yes	
D.pharm	KLE Alumni	Interested/earlier attended meeting with DHO and DTO	No				No	No	No	Yes	Private
D.pharm		Agreed to come for training	Yes	1 to 2			No	No	No	Yes	
D.pharm., B.Sc		Agreed to come for training	Earlier dispensing				No	No	No	Yes	
D.pharm		Agreed to come for training	No				No	Yes (only dispensing slips)	No	Yes	private
D.pharm	KLE alumni	Interested/ Agreed to come for training	Yes	5			No	No	No		
D.paharm		Not interested	No				No	No	No		
D.pharm	KLE Alumni	Agreed to come for training	No				No	No	No	Yes	
D.pharm		Not interested	No				No	No	No	Yes	
D.pharm		Interested/ Agreed to come for training	No				No	No	No	Yes	
B.Pharm	KLE Alumni	Interested/ agreed to come for training	No				No	No	No		
D.paharm		Not interested	No				No	No	No	Yes	Private
D. Pharm	KLE Alumni	Interested/ agreed to come for training	Yes	1 to 3			No	No	No	Yes	Private
B.Pharm	KLE Alumni	Agreed to come for training	Yes	1 to 2			No	No	No	Yes	Private and self medication
D. pharm	KLE Alumni	Interested/ agreed to come for training	Yes	6 to 7		6	No	No	No		
D.paharm		Not interested	No				No	No	No	Yes	
D. Pharm	KLE Alumni	Agreed to come for training	No				No	Yes	No	Yes	
D. Pharm	KLE Alumni	Interested/ agreed to come for training	No				No	No	No	Yes	
D.pharm., B.Sc		Interested/onsite training	No				No	No	No		Private
D. Pharm., B.sc	KLE Alumni	Not interested	Yes	rare			No	No	No	Yes	
D.paharm		Not interested	No				No	No	No	Yes	Private
D.pharm		Agred to come for training	Yes	1 to 2			No	No	No	Yes	
D. Pharm	KLE Alumni	Interested/onsite training	Earlier dispensing				No	No	No	Yes	
D.pharm	KLE Alumni	Agred to became DOTS	No				No	No	No	Yes	Private
D.pharm	KLE Alumni	Interested/ agreed to come for training	Yes	1 to 2		34	No	No	No	Yes	
D.paharm		Don't have time	No				No	No	No		
D.pharm		Qp not available	No				No	No	No		
D.pharm		qp not available	Yes	rare			No	No	No	Yes	
D.pharm., B.Sc		Agreed to come for training	No				No	No	No	Yes	
D.pharm		Don't have time	No				No	No	No	Yes	
D.pharm		Agred to come for training	No				No	No	No		
D.paharm		Don't have time	No				No	No	No		Govt
D.paharm		Don't have time	No				No	No	No		
D.pharm		Agreed to come for training	Yes	2			No	No	No	Yes	
B.pharm	KLE Alumni	Interested/ Agreed to come for training	No				No	No	No	Yes	
D.pharm	KLE Alumni	Agreed to come for training	No				No	No	No	Yes	
D.Pharm		Don't have time	No				No	No	No		
D.pharm		Don't have time	No				No	No	No		
D.pharm		Don't have time	No				No	No	No		
D.pharm		Don't have time	No				No	No	No		
D.paharm		Not interested	No				No	No	No	Yes	
D.paharm		Not interested	No				No	No	No		Private
D.paharm		Not interested	No				No	No	No		
D. Pharm		Don't have time	Yes	2 to 3			No	No	Mainitainig record at first visit		
D.pharm		Don't have time	Yes	2 to 3			No	No	No	Yes	Private
D.pharm		Not interested	Yes				No	No	No		
D.paharm		Don't have time	No				No	No	No		
D.pharm		Don't have time	Earlier dispensing				No	No	No		
D.pharm., B.Sc	KLE Alumni	Interested/ Agred to come for training	Yes	rare			No	No	No	Yes	Private
D.pharm		Interested/agreed to come for training	Yes	2 to 3			No	No	No		Private
B.Pharm	KLE Alumni	Agreed onsite training	Yes	10 to 20		Since beginning	No	No	No		govt. and private
D.pharm	KLE Alumni	Agreed on site training	Yes	DON'T KNOW			No	No	No		no idea
D.pharm		Not interested	Yes	DON'T KNOW			No	No	No		Private
B.Pharm	KLE Alumni	Not interested	Yes	15 to 20		Since establish	No	No	No		Private
D.pharm		Agreed onsite training	No				No	No	No	Yes	
D.pharm	KLE Alumni	Interested/agreed to come for training	Yes	DON'T KNOW			No	No	No	Yes	

D.pharm		Agreed to come for training	Yes	3 to 4			No	No	No		Private
B.Pharm		Agreed to come for training	No				No	No	No	Yes	
D.paharm		Not interested	No				No	No	No		
D.pharm		Don't have time	Earlier dispensing				No	No	No		self medication
D.paharm		Don't have time	No				No	No	No	No	
D.paharm		Interested/agreed to come for training	No				No	No	No	Yes	
D.paharm		Not interested	Yes	rare			No	No	No		
D.paharm		agreed to come for training	No				No	No	No	Yes	
M.pharm	KLE Alumni	Agreed to come for training/daughter is qp	No				No	No	No	Yes	
D.pharm		Not interested	No				No	No	No		
D.paharm		Not interested	No				No	No	No		
D.paharm		Don't have time	No				No	No	No		
D.Pharm		Interested/agreed to come for training	No				No	No	No	Yes	
D.Pharm	KLE Alumni	Interested to come for training	No				No	No	No		
D.paharm		Agreed to come for training	No				No	No	No		
D.pharm		Not interested	no				No	No	No		
B.Com., D.pham	KLE Alumni	Agreed to come for training	Yes	3 to 4			No	No	No		Private
D.paharm		Interested/agreed to come for training	Earlier dispensing				No	No	No		
D.pharm	KLE Alumni	Agreed to come for training	Yes	2 to 3			No	No	No		Private/ Self medication
D.paharm		Don't have time	No				No	No	No		
D.pharm., DMLT	KLE Alumni	Interested/ agreed to come for training	yes	2 to 4			No	No	No	Yes	private
D.pharm		agreed to come for training	No				No	No	No		
D.PHARM		Interested/ agreed to come for training	No				No	No	No		
D.Pharm		Not interested	Yes	4 to 5			No	No	No		
D.pharm		Don't have time	No				No	No	No		
D.Pharm		Interested to come for training	Yes	but no sale			No	No	No	Yes	
D.pharm		Don't have time	No				No	No	No		
D.pharm		Agree to come for training	No				No	No	No		
D.pharm	KLE Alumni	Not interested	No				No	No	No		
D.paharm		Not interested	No				No	No	No		
D.pharm. M.pharm. Maratha mandal lecturer		Not interested	No				No	No	No		
D.pharm	KLE Alumni	Interested/agreed to come for training	No				No	No	No		
D.Pharm		Agreed to come for training	No				No	No	No	Yes	
D.paharm		Agreed to come for training	Yes	no sale			No	No	No		
D.paharm		Don't have time	No				No	No	No		
D.pharm		Don't have time	No				No	No	No		
D.pharm	KLE Alumni	Don't have time	No				No	No	No	Yes	

Gender 22 Female  
206 male  
Drug Distributors/ Whole sale shop 180  
Non availability of Qualified Pharmacist 80  
In-house hospital Pharmacies 15









Sl	Name	Age	Sex	Urban/Rural	Address	Mob No.	Date of TB diagnosis	Date of TB treatment Initiated	Patients Type	Wt in kg	Habits	Marital Status	Education	Occupation	modified Kuppuswamy Socioeconomic status scale			Kuppuswamy's socio-economic status scale 2019	Socioeconomic class
															Occupation of the head of the family	Education of the family	Total monthly income of the family		
1	Prakash s Ravaput	32	M	Rural	Gokak	9731467720	28/3/19	28/3/19	New	30	0	Married	Intermediate school	Employed	5	6	6	17	2
2	Surayya Belagami	61	F	Rural	Belagavi	9611814610	3/3/19	3/3/19	New	50	Tobacco	Married	Primary level	Employed	3	2	3	8	4
3	Abdul Mufsa	40	M	Rural	Khanapur	8722346812	20/11/18	04/06/2019	New	63	Alcohol	Married	University	Employed	6	6	4	16	2
4	Sarojini P	71	F	Rural	Shindoli	8971617007	01/10/2019	03/10/2019	New	30	0	Married	Intermediate school	Employed	4	5	3	12	3
5	Vinayak Krishna Kesarkar	32	M	Rural	Modage Hukkeri	9819389264	06/06/2019	06/06/2019	New	57	Alcohol	Married	University	Employed	6	6	4	16	2
6	Naznin Sayyad	35	F	Urban	Azad nagar, Belagavi	6364382576	06/05/2019	06/05/2019	New	46	0	Married	University	Employed	6	6	4	16	2
7	Yashoda B Kanakeri	18	F	Urban	Goa	9964028525	06/04/2019	06/04/2019	New	36	0	Non married	Secondary level	Non Employed	1	4	2	7	4
8	Aafra Athani	26	F	Urban	Kamat galli, Belagavi	9449078661	29/5/19	29/5/19	New	17	0	Non married	University	Non Employed	4	6	3	13	3
9	Abhishek Talwar	21	M	Urban	Ramtirth Nagar Belagavi	7204313375	27/6/19	27/6/19	MDR	54	Alcohol, Smoking	Non married	University	Non Employed	1	6	1	8	4
10	Shreyas Adin	25	M	Rural	Naragund	9591436647	27/6/19	27/6/19	New	14	0	Non married	Intermediate school	Non Employed	1	5	1	7	4
11	Shilpa Bichakatti	25	F	Urban	Bhavani Nagar Belagavi	7204497105	24/6/19	18/6/19	New	55	0	Non married	University	Non Employed	1	6	1	8	4
12	Pramod Gadi	23	M	Rural	Khanapur	9241206119	18/6/19	14/6/19	New	54	0	Non married	University	Non Employed	1	6	1	8	4
13	Praveen Gadi	22	M	Rural	Khanapur	9902756663	14/6/19	28/6/19	New	49	0	Non married	University	Non Employed	1	6	1	8	4
14	Ranjana Mastamaradi	20	F	Rural	Shindoli	9449308260	28/6/19	28/6/19	New	30	0	Non married	Intermediate school	Non Employed	1	6	1	8	4
15	Praveen Baragali	30	M	Rural	Shankeshwar	9448859458	07/02/2019	07/02/2019	New	64	0	Married	University	Employed	6	6	18	2	2
16	Lahu Dalavi	57	M	Rural	Chandgad	9421284953	07/07/2019	07/07/2019	New	55	0	Married	Secondary level	Employed	4	4	4	12	3
17	Almas Bepuri	20	M	Rural	Aminagad	9880144684	07/11/2019	07/11/2019	New	30	0	Married	Secondary level	Non Employed	3	4	1	8	4
18	Mujeeb muniya	25	M	Urban	Azad nagar, Belagavi	8088043595	18/7/19	18/7/19	New	50	0	Married	University	Non Employed	1	6	1	6	4
19	Babji Desai	52	M	Rural	Manipalgad	7204282096	26/7/19	12/7/19	New	63	0	Married	Intermediate school	Employed	3	4	4	11	3
20	Suraj Desai	18	M	Rural	Manaipalgad	7204282096	28/7/19	28/7/19	New	49	Alcohol, Tobacco	Non married	Intermediate school	Non Employed	1	4	1	6	4
21	Shivprasad Irappa	18	M	Urban	Bhavani S.C Motar, Belagavi	7204497105	08/06/2019	08/06/2019	New	47	Alcohol, Smoking	Non married	Intermediate school	Non Employed	1	4	1	6	4
22	Muniyappa Benni	67	M	Urban	Belagavi	9241206119	08/05/2019	08/05/2019	New	52	0	Married	No Schooling	Employed	4	1	4	9	4
23	Roopa S	28	F	Rural	Mudhol	9902756663	18/8/19	18/8/19	New	42	0	Married	University	Non Employed	1	6	1	8	4
24	Prakash Patil	70	M	Urban	Belagavi	9449308260	26/8/19	26/8/19	New	62	Tobacco	Married	No Schooling	Employed	3	1	4	8	4
25	Akash Bepari	20	F	Urban	Bagalkot	9740823318	28/8/19	28/8/19	New	37	0	Married	Intermediate school	Non Employed	1	4	1	6	4
26	Lokesh Desai	57	M	Rural	Chandgad	9421284953	29/8/19	29/8/19	Old	53	0	Married	No Schooling	Employed	4	1	3	8	4
27	Ramanna Birvar	58	M	Rural	Raichur	8150010835	09/02/2019	09/02/2019	New	69	Smoking, Tobacco	Married	No Schooling	Employed	2	1	2	5	5
28	Tanveer Naik	37	M	Rural	Mumbai	9892431905	09/07/2019	09/07/2019	New	58	Alcohol	Married	Primary level	Employed	3	4	3	10	4
29	Ravi Knakali	30	M	Urban	Belagavi	9379920545	09/11/2019	09/11/2019	New	38	Alcohol	Married	Intermediate school	Employed	5	5	3	13	3
30	Nangendra Gary	57	M	Urban	Ramteerth nagar, Belagavi	8861916100	18/9/19	18/9/19	Old	56	Alcohol, Smoking, Tobacco	Married	Primary level	Employed	3	4	4	11	3
31	ManjitSiagh Nirala	20	M	Urban	Belagavi	7795275214	18/9/19	19/9/19	New	60	0	Non married	Secondary level	Non Employed	1	4	1	6	4
32	Arunkumar Killedar	25	M	Rural	Gokak	9795275219	19/9/19	19/9/19	Old	55	Alcohol	Non married	University	Non Employed	1	6	1	8	4
33	Ramesh Chopade	52	M	Urban	Belagavi	9845643021	19/9/19	19/9/19	New	52	Alcohol, Tobacco	Married	Intermediate school	Employed	4	5	4	13	3
34	Chandu Sanadi	18	M	Rural	Kadadi	9482086107	19/9/19	19/9/19	New	43	Alcohol, Smoking	Non married	Secondary level	Non Employed	3	4	3	10	4
35	Nagappa Aralikar	44	M	Rural	Deshnur	9741833791	20/9/19	20/9/19	New	55	0	Married	Intermediate school	Employed	3	5	2	10	4
36	Prashanth Hiremath	30	M	Rural	Devarshihatti	9880453366	23/9/19	23/9/19	New	71	Alcohol	Married	University	Employed	5	6	4	15	3
37	Raju B Kalkutaagi	39	M	Rural	Narshingpur	9164585815	23/9/19	23/9/19	New	67	Alcohol	Married	Primary level	Employed	3	3	4	10	4
38	Sunil Byakwad	47	M	Urban	Shahpur, Belagavi	9341936618	10/09/2019	10/09/2019	New	62	0	Married	Secondary level	Employed	4	4	3	11	3
39	Prashanth Kumar Yalburg	48	M	Rural	Shindhatti	7676633947	10/11/2019	10/11/2019	New	50	0	Married	Primary level	Employed	3	2	3	8	4
40	Balu Patri	49	M	Urban	Ramnagar, Belagavi	7353850194	10/12/2019	10/12/2019	New	41	0	Married	Primary level	Employed	3	2	3	8	4
41	Sharwani Betageri	75	F	Rural	Suldal	9164306505	14/10/19	14/10/19	New	28	0	Married	Primary level	Employed	3	2	3	8	4
42	Ajay kangralkar	42	M	Urban	Kangral, Belagavi	7829685658	15/10/19	15/10/19	New	70	Smoking, Tobacco	Married	Primary level	Employed	3	2	3	8	4
43	Surayya Belagavi	65	F	Urban	Mahantesh nagar Belagavi	9945488310	22/10/19	22/10/19	New	50	0	Married	No Schooling	Employed	3	1	3	7	4
44	Laxman Rathod	28	M	Rural	Bannur, Ramdurg	8152863998	22/10/19	22/10/19	New	44	0	Married	University	Employed	6	6	4	16	2
45	Ayesh Shaikh	19	F	Urban	Sadashivnagar, Belagavi	9986726930	23/10/19	23/10/19	New	56	0	Non married	Primary level	Non Employed	3	2	3	8	4
46	Chandrakanth Karling	53	M	Rural	Sankeshwar	7816089090	24/10/19	24/10/19	New	52	0	Married	Secondary level	Employed	4	4	3	11	3
47	Godawa Kamuri	55	F	Rural	Khanapur	9945646774	11/02/2019	11/02/2019	New	70	0	Married	Intermediate school	Employed	4	5	4	14	4
48	Yashoda Kankori	18	F	Urban	Goa	9964028525	11/02/2019	11/02/2019	New	39	0	Non married	Secondary level	Non Employed	3	3	3	9	4
49	Shivbasappa Muttur	36	M	Rural	Rabkavi	8904819553	11/07/2019	11/07/2019	New	87	Tobacco	Married	Intermediate school	Employed	4	4	3	11	3
50	Nikita koogi	35	F	Urban	Ganeshpur, Belagavi	8762382205	28/11/19	28/11/19	New	48	0	Married	Secondary level	Employed	4	4	3	11	3
51	Parushuram Pamnavar	54	M	Urban	Raichur	9901102785	30/11/19	30/11/19	New	74	Alcohol	Married	Intermediate school	Non Employed	1	5	4	10	4
52	Raju poojari	32	M	Rural	Yargatti	8747871628	30/11/19	30/11/19	New	61	Alcohol	Married	Intermediate school	Employed	4	5	4	14	4
53	Shanth rathod	57	F	Urban	Huabali	9886181120	12/06/2019	12/06/2019	New	48	0	Married	Intermediate school	Employed	4	5	4	14	4
54	Shivani kolkar	20	F	Urban	Belagavi	7259921878	12/09/2019	12/09/2019	New	42	Tobacco	Non married	Intermediate school	Non Employed	1	5	4	10	4
55	Raju Paneri	32	M	Rural	Mudigunji	8762823192	17/12/19	17/12/19	New	47	Alcohol, Smoking, Tobacco	Married	University	Employed	6	6	4	16	2
56	Advappa hullikeri	76	M	Urban	Hubli	9964028525	18/12/19	18/12/19	New	50	Alcohol	Married	No Schooling	Employed	2	1	2	5	4
57	Mohammed Nadaf	35	M	Rural	Batyageri	6364239506	19/12/19	19/12/19	New	41	0	Married	Intermediate school	Employed	2	5	4	11	3
58	Shivlila Kbadagi	19	F	Rural	Shivpur	8861946588	01/10/2020	01/10/2020	New	33	0	Non married	Intermediate school	Non Employed	1	5	3	9	4
59	Kavita Bhosle	45	F	Rural	Chandgad	8308255676	17/1/20	17/1/20	New	46	0	Married	Intermediate school	Employed	2	5	2	9	4





SL no	SF-12												SF-12												
Domains	General Health	Limitations Activities		Physical Health Problems		Emotional Health Problems		Pain	Energy and Emotions			Social Activities		General Health	Limitations Activities		Physical Health Problems		Emotional Health Problems		Pain	Energy and Emotions		Social Activities	
	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12		Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12
1	2	2	2	3	4	4	4	5	2	2	3	4		3	2	1	2	2	1	1	1	4	4	1	1
2	3	3	2	4	4	5	4	4	2	2	4	4		2	3	2	4	4	2	2	2	3	3	3	2
3	2	2	2	3	4	4	4	5	2	2	3	4		3	2	1	2	1	1	1	1	3	5	1	2
4	2	2	2	3	4	4	4	5	2	2	3	4		3	2	1	2	2	1	1	1	4	4	1	2
5	2	2	2	3	4	4	4	5	2	2	3	4		3	2	1	2	2	1	1	1	4	4	1	2
6	3	3	2	4	4	5	4	4	2	2	4	4		3	2	2	2	2	2	1	1	4	4	2	2
7	3	3	2	4	4	5	4	4	2	2	4	4		3	2	1	2	1	2	1	1	4	4	2	2
8	3	3	2	4	4	5	4	4	2	2	4	4		3	2	2	2	2	2	1	1	3	4	2	1
9	2	2	2	3	4	4	4	5	2	2	3	4		3	2	1	2	2	1	1	1	4	4	1	2
10	2	2	2	3	4	4	4	5	2	2	3	4		3	2	2	2	2	1	1	1	4	4	1	1
11	3	3	2	4	4	5	4	4	2	2	4	4		2	3	2	4	4	2	2	2	3	3	3	2
12	3	3	2	4	4	5	4	4	2	2	4	4		3	2	2	2	1	2	1	1	4	4	2	1
13	2	2	2	3	4	4	4	5	2	2	3	4		3	2	1	2	2	1	1	1	4	4	1	2
14	2	2	2	3	4	4	4	5	2	2	3	4		3	1	1	2	2	1	1	1	4	4	1	1
15	3	3	2	4	4	5	4	4	2	2	4	4		3	2	1	2	2	2	1	1	4	5	2	2
16	3	3	2	4	4	5	4	4	2	2	4	4		3	2	2	2	1	2	1	1	4	4	2	1
17	2	2	2	3	4	4	4	5	2	2	3	4		3	1	2	2	2	1	1	1	4	4	1	1
18	2	2	2	3	4	4	4	5	2	2	3	4		3	2	1	2	2	1	1	1	4	4	1	2
19	3	3	2	4	4	5	4	4	2	2	4	4		3	2	2	2	2	2	1	1	4	4	2	1
20	2	2	2	3	4	4	4	5	2	2	3	4		2	3	2	4	4	2	2	2	3	3	3	2
21	2	2	2	3	4	4	4	5	2	2	3	4		3	2	1	2	2	1	1	1	4	4	1	1
22	3	3	2	4	4	5	4	4	2	2	4	4		3	2	1	2	1	2	1	1	4	4	2	2
23	3	3	2	4	4	5	4	4	2	2	4	4		3	2	1	2	2	2	1	1	4	4	2	1
24	2	2	2	3	4	4	4	5	2	2	3	4		3	2	2	2	2	1	1	1	4	4	1	1
25	2	2	2	3	4	4	4	5	2	2	3	4		3	1	1	2	2	1	1	1	4	5	1	2

SL no	SF-12												SF-12												
Domains	General Health	Limitations Activities		Physical Health Problems		Emotional Health Problems		Pain	Energy and Emotions			Social Activities		General Health	Limitations Activities		Physical Health Problems		Emotional Health Problems		Pain	Energy and Emotions		Social Activities	
	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12		Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12
26	3	3	2	4	4	5	4	4	2	2	4	4		3	2	1	2	2	2	1	1	3	4	2	1
27	2	2	2	3	4	4	4	5	2	2	3	4		3	2	2	2	2	1	1	1	4	4	1	2
28	2	2	2	3	4	4	4	5	2	2	3	4		3	2	2	2	2	1	1	1	4	4	1	2
29	2	2	2	3	4	4	4	5	2	2	3	4		3	2	2	2	2	1	1	1	3	4	1	1
30	2	2	2	3	4	4	4	5	2	2	3	4		3	2	2	2	2	1	1	1	4	4	1	2
31	3	3	2	4	4	5	4	4	2	2	4	4		3	2	2	2	1	2	1	1	4	4	2	1
32	3	3	2	4	4	5	4	4	2	2	4	4		3	2	1	2	2	2	1	1	3	4	2	1
33	2	2	2	3	4	4	4	5	2	2	3	4		3	2	2	2	2	1	1	1	4	4	1	2
34	2	2	2	3	4	4	4	5	2	2	3	4		3	2	2	2	2	1	1	1	4	4	1	1
35	3	3	2	4	4	5	4	4	2	2	4	4		3	2	2	2	2	2	1	1	4	4	2	2
36	2	2	2	3	4	4	4	5	2	2	3	4		2	3	2	4	4	2	2	2	3	3	3	2
37	2	2	2	3	4	4	4	5	2	2	3	4		3	2	1	2	2	1	1	1	4	4	1	2
38	3	3	2	4	4	5	4	4	2	2	4	4		3	1	2	2	2	2	1	1	4	5	2	1
39	2	2	2	3	4	4	4	5	2	2	3	4		3	2	1	2	1	1	1	1	3	4	1	2
40	2	2	2	3	4	4	4	5	2	2	3	4		3	2	2	2	2	1	1	1	4	4	1	1
41	3	3	2	4	4	5	4	4	2	2	4	4		2	3	2	4	4	2	2	2	4	3	3	2
42	3	3	2	4	4	5	4	4	2	2	4	4		3	2	1	2	2	2	1	1	4	4	2	1
43	3	3	2	4	4	5	4	4	2	2	4	4		3	2	1	2	2	2	1	1	4	4	2	1
44	3	3	2	4	4	5	4	4	2	2	4	4		3	2	1	2	1	2	1	1	3	4	2	2
45	3	3	2	4	4	5	4	4	2	2	4	4		3	2	2	2	2	2	1	1	4	5	2	1
46	2	2	2	3	4	4	4	5	2	2	3	4		3	2	1	2	2	1	1	1	4	4	1	2
47	2	2	2	3	4	4	4	5	2	2	3	4		3	1	1	2	2	1	1	1	3	4	1	1
48	3	3	2	4	4	5	4	4	2	2	4	4		3	2	1	2	2	2	1	1	4	4	2	1
49	3	3	2	4	4	5	4	4	2	2	4	4		3	2	1	2	2	2	1	1	4	4	2	2
50	2	2	2	3	4	4	4	5	2	2	3	4		3	2	2	2	2	1	1	1	4	4	1	1