A PRE-EXPERIMENTAL STUDY TO ASSESS THE EFFECTIVENESS OF STRUCTURED TEACHING PROGRAMME ON KNOWLEDGE REGARDING MDR & XDR TB AMONG HEALTH WORKERS IN BALH BLOCK, MANDI (H.P) 2023".

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ABSTRACT
Aim
The study was planned to assess the effectiveness of structured teaching programme on knowledge regarding MDR& XDR TB among 30 health workers in Balh Block Mandi.

Methodology
 A pre-experimental one-group pre-test post-test design was employed. Convenient sampling technique is used to select 30 health workers. The study was conducted at Balh Block of Distt. Mandi (H.P). Knowledge levels were assessed by using a pretested self questionnaire before the intervention. After that a structured teaching program was administered, focusing on MDR &XDR-TB symptoms, prevention & programmes. Then post-intervention knowledge was evaluated by using the same questionnaire after 7th days of administration of structured teaching program.

 Result
In the pre-test, 50% (15 out of 30) had inadequate knowledge, while 50% of participants (15 out of 30) initially had moderate knowledge, this decreased to 40% (12 out of 30) in the post-test, reflecting a shift of many participants from moderate to adequate knowledge. The most significant improvement was observed in the increase of participants with adequate knowledge: initially, 0% (0 out of 30) had adequate knowledge, but after the intervention, this rose to 60% (18 out of 30). In the present study, the pre-test knowledge score showed a mean of 10.53±1.167. The post-test score revealed a mean of 21.13±1.479.

Conclusion

This study provides evidence that targeted educational interventions can significantly enhance the competence of health workers in managing complex TB cases, ultimately contributing to better patient outcomes and stronger public health responses to MDR and XDR TB.

Keywords: MDR&XDR-TB, Structured teaching program, Health workers

INTRODUCTION

BACKGROUND OF THE STUDY

"Be solution-focused, not problem-focused."

-Mike Brescia

Drug-resistant tuberculosis (DR-TB) is a big problem, especially in poor areas where people are often malnourished and don't understand how to stay healthy. If someone already has TB or is around someone who has DR-TB, they have a higher chance of getting drug-resistant TB. "Drug-resistant" means the TB bacteria aren't affected by the main drugs used to treat TB. There are two main ways to get drug-resistant TB: by not getting the right treatment for TB, or by getting it from someone else who has drug resistant TB. The best way to deal with this problem is to find TB early and treat it properly. It's also important to promote good health and hygiene habits.

When patients have Multidrug-resistant TB (MDR-TB), it means that they are not responding to at least two of the primary drugs used to treat TB disease "isoniazid and rifampcin". These two drugs are commonly used to treat TB, but in MDR-TB patients, they do not work effectively. XDR-TB is a rare type of MDR-TB, where patients are resistant to more types of TB drugs. "isoniazid and rifampicin"a "fluoroquinolone", and a second-line injectable drug such as "amikacin, capreomycin, and kanamycin"

The WHO changed their rules in May 2022 to treat drug-resistant tuberculosis (TB) by using a new medicine called BPaLM for patients with MDR/RR-TB. These new guidelines showed better results. There are about 500,000 new cases of drug- resistant TB each year, but only one in three people with MDR/RR-TB are getting treated. the COVID-19 pandemic may have contributed to the further spread of the MDR/RRTB strains of Mycobacterium tuberculosis.

The World Health Organization and United Nations have a plan called the End TB strategy to decrease TB deaths by 95% from the 2015 levels. This is important in countries with limited resources. The plan has three parts: early diagnosis and treatment, strong government policies and support, and more research to create new ways to fight TB. The plan has specific goals for the years 2020, 2025, 2030, and 2035.
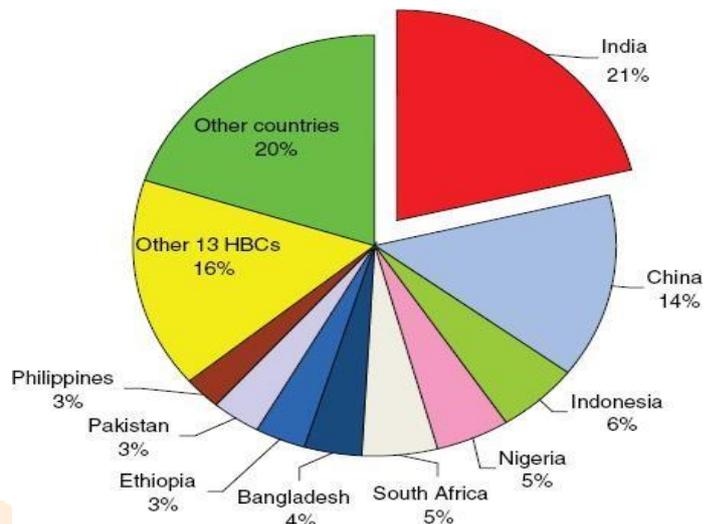

Fig 1. This chart shows India having the highest burden at 21% based on the data provided by WHO.

NEED OF THE STUDY

The emergence and spread of MDR (multidrug-resistant) and XDR (extensively drug-resistant) bacteria is growing concern worldwide, and health workers play a critical role in preventing and controlling infections caused by these organisms. Therefore, assessing the knowledge of health workers regarding MDR and XDR is essential to determine whether they have sufficient knowledge and skills to manage and control these infections.

A study to assess the knowledge regarding MDR and XDR among health workers could help to identify gaps in their knowledge and training, which could potentially compromise their ability to identify and manage these infections. This study can also provide insights into the factors that influence knowledge levels among health workers, such as their level of education, experience, and exposure to MDR and XDR infections.

Furthermore, this study can also help in developing appropriate educational interventions or training programs to improve the knowledge and skills of health workers in managing MDR and XDR infections. These interventions can be designed to address the specific knowledge gaps identified through the study, and can

potentially improve patient outcomes, reduce morbidity and mortality, and prevent thespread of MDR and XDR bacteria.

PROBLEM STATEMENT

"A Pre-experimental study to assess the effectiveness of structured teaching programme on knowledge regarding MDR & XDR TB among health workers in Balh Block, Mandi (H.P) 2023".

OBJECTIVES

1. To assess the pre-test knowledge regarding MDR – TB and, XDR – TB among health workers in Balh block, Mandi (H.P) 2023.
2. To develop and implement STP on knowledge regarding MDR-TB and XDRTB among health workers in Balh block, Mandi (H.P) 2023.
3. To assess the effectiveness of STP on knowledge regarding MDR-TB and XDRTB among health workers in Balh block, Mandi (H.P)2023.
4. To determine association of Pre-test & post-test knowledge regarding MDR –TB and, XDR – TB with selected demographic variables.

HYPOTHESIS

✦ **H1 -** There will be significance difference between pre-test and post-test knowledgescores on MDR & XDR –TB among Health workers.

✦ **H₂** - There will be significant association between knowledge scores with selected demographic variables

REVIEW OF LITERATURE

The literature review on different aspects of the study has been organised under three main headings.

1. Knowledge regarding MDR& XDR-TB.
2. Effectiveness of STP on TB & MDR & XDR-TB.
3. Knowledge regarding DOTS therapy.

LITERATURE RELATED TO KNOWLEDGE REGARDING MDR XDR-TB:

Amna Saifullah, Tauqeer Hussain Mallhi et al. (2023): Conducted retrospectively study among patients seeking medical care at a tertiary care hospital during 2014–2019, this study focused on those diagnosed with DR-TB and DS-TB. DR-TB types included rifampicin-resistant tuberculosis (RR-TB), Multidrug-resistant tuberculosis (MDRTB), and extensively drug-resistant tuberculosis (XDR-TB).

Among 580 patients, DSTB was diagnosed in 198 (34.1%) patients, while DR-TB was present in 382 patients. Specifically, RR-TB, MDR-TB, and XDR-TB were diagnosed in 176 (30.3%), 195 (33.6%), and 11 (1.9%) patients, respectively. Significant differences (P < 0.05) in demographics and clinical-laboratory characteristics were observed between DS-TB and DR-TB patients. Logistic regression analysis identified age ≤38 years, single marital status, tobacco use, previous treatment, treatment failure, and cavity on chest Xray as independent risk factors for MDR-TB

Yuanping Pan, Yingying Yu(2023): Conducted as a descriptive study, this research aimed to explore the differences in drug resistance patterns and risk factors for multidrug resistant tuberculosis (MDR-TB) in patients with and without diabetes mellitus (DM). The study revealed no significant differences in resistance patterns, except for arbitrary resistance to some drugs and pre-XDR-TB. Additionally, it observed a significant downward trend in MDR-TB and pre-XDR-TB patterns from 2016 to 2021. Moreover, the study identified distinct risk factors for MDR-TB in patients with and without DM.

LITERATURE RELATED TO EFFECTIVENESS OF STP ON TB(MDR&XDR-TB):

Divya Dayal(2023): Conduct a pre-experimental study to examine how a comprehensive teaching program improved patients' understanding of pulmonary tuberculosis and DOTS therapy in the OPD of selected hospitals in Bhiwani, Haryana. The study involved 60 patients from the DOTS clinic, selected via convenience sampling. Data was collected using a structured knowledge questionnaire over ten days, with pre-tests on May 17, 2021, and post-tests ten days later. Results showed the mean pre-test score was 9.45 (SD 2.65), and the post-test mean was 19.40 (SD 1.86). The mean difference was 9.95, with a paired 't' test result of 24.60 (p-value 0.01), indicating statistical significance.

Bharti Sachdeva, Nisha etal (2022) Conduct a one-group pre-test, post-test study to evaluate the effectiveness of a training program on multidrug-resistant tuberculosis for 50 staff nurses. Purposive sampling was used to select the sample, and their knowledge was assessed using a structured questionnaire. Results showed the mean post-test knowledge score was 16.48, higher than the mean pre-test score of 7.4, indicating an improvement. Descriptive and inferential statistics revealed a significant difference between the mean pre and post-test knowledge scores.

LITERATURE RELATED TO KNOWLEDGE REGARDING DOTS THERAPY

Rohit Kamble,Dr, Sunil Kulkarni(2024):A Quantitative Research approach and PreExperimental- One grouppre-test -post-test design was adopted for the study. The conceptual framework used in the study was an open system by Ludwig Von Bertalanffy's. The study was conducted in selected DOTS centres of Sangli, Miraj Kupwad corporation. The sample size was obtained by power analysis and the NonProbability Incidental sampling technique was used with a sample size of 65 patients. Data collection was done by using Demographic variables and a structured knowledge questionnaire. Result And Conclusion- The pre-test revealed that the majority of patients receiving DOTS therapy 49(75.39%) had poor knowledge (Score 06-09), 10(15.38%) had average knowledge (Score 10-13), and 6(9.23%) had good knowledge (Score 14-17) scores. The post-test revealed that the majority of patients 51(78.47%) had average knowledge (Score 10-13), 10(15.38%) had poor knowledge (Score 06-09), and 4(6.15%) had good knowledge (Score 14-17) score. The calculated paired t -value is 17.2485.

Nayana Kalane (1- JAN-2022): Conducted a nonexperimental, descriptive study using purposive sampling to select 30 participants based on predetermined criteria. Data were analyzed and interpreted according to the study's objectives and hypotheses, employing descriptive and inferential statistics with a significance level of 5%. Demographic characteristics were described by frequency and percentage distribution, showing that 26.6% were aged 15-25 years, 80% were male, most had a high school education, and 73.3% were Hindu. Among the 30 DOTS providers, 40% had moderate knowledge of DOTS therapy, 33.3% had adequate knowledge, and 26.6% had inadequate knowledge.

Material Methods:

This study used a quantitative research approach with a pre-experimental one-group pretest-posttest design, conducted at CHC Ratti in Balh block. The target population was health workers with a sample size of 30 selected through convenience sampling. A self-structured knowledge questionnaire and socio-demographic tool were used, and the structured teaching programme (STP) was delivered via PowerPoint. The conceptual framework of the study was based on Ludwig von Bertalanffy's General System Theory,Validity was ensured using the Delphi technique, feasibility tested through a pilot study on 3 health workers, and reliability confirmed using Karl Pearson's correlation (r = 0.7)
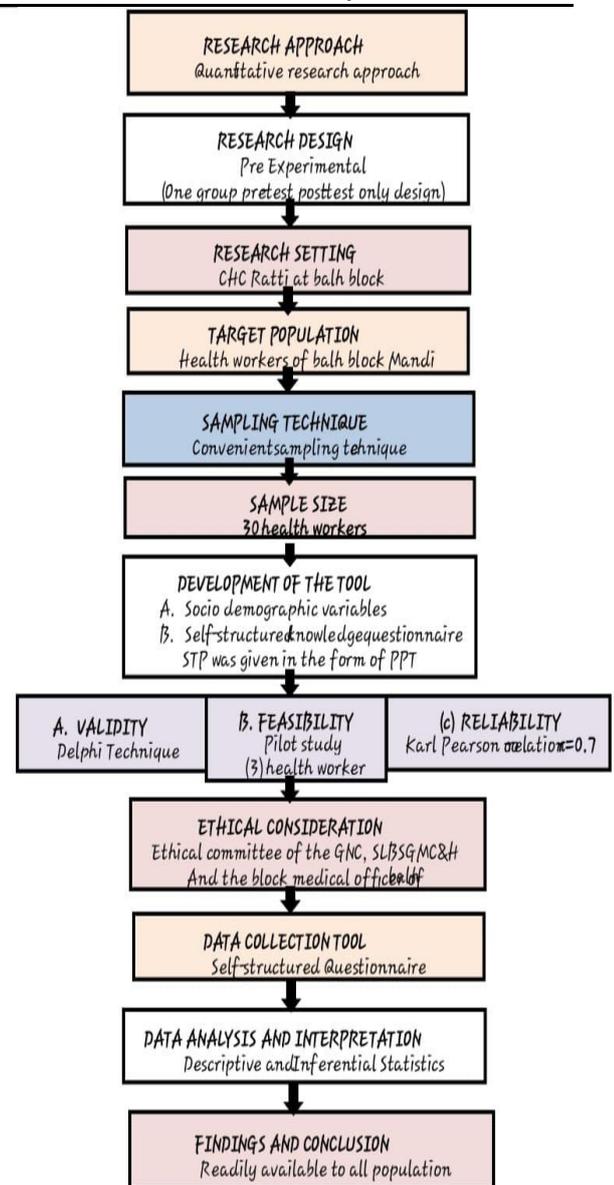
DATA ANALYSIS:

Organization of Analyzed Data:

The analyzed data was organized according to the objectives and presented under the following sections:

SECTION A

Findings related to Frequency(f) and percentage (%) distribution of health workers according to their sociodemographic variables.

SECTION B

Findings related to comparison of pre-test and post-test knowledge score

SECTION C

Findings related to association between knowledge score with their selected socio demographic variables of health workers on knowledge regarding MDR&XDR-TB.

SECTION-A

Description of demographic profile

This section describes the demographic characteristics of the sample under study. The data obtained describes the characteristics pertaining (Age, gender, education qualification, year of experience, work setting, job title, monthly income, are you aware about MDR&XDR TB, any experience with TB patient, area of residence)

TABLE 4.1: Findings related to Frequency(f) and percentage (%) distribution of health workers according to their sociodemographic variables.

N=30

Variables	Options	Frequency/%
Age	21-30 years	3(10.0%)
	31-40 years	**16(53.3%)**
	41-50 years	7(23.3%)
	51-60 years	4(13.3%)
Gender	Male	2(6.7%)
	Female	**28(93.3%)**
Education Qualification	ANM	23 76.7%)
	MPW male	2(6.7%)
	MPW female	**5(16.7%)**
Year of Experience	<10 years	8(26.7%)
	10-20 years	**13(43.3%)**
	21-30 years	8(26.7%)
	31-40 years	1(3.3%)
	41-50 year	0(0.0%)
Work Setting	**Sub-center**	**29(96.7%)**
	PHC	0(0.0%)
	CHC	1(3.3%)
	DOTS Centers	0(0.0%)
Job Title	MHW	2(6.7%)
	FHW	**28(93.3%)**
Monthly Income	<20000	2(6.7%)
	20001- 30000	8(26.7%)
	30001-40000	**10(33.3%)**
	>40000	**10(33.3%)**
Are you Aware about MDR& XDRTB	**Yes**	**30(100.0%)**
	No	0(0.0%)
Any Experience With TB Patient	Yes	27(90.0%)
	No	3(10.0%)
Area of residence	**Rural**	**19(63.3%)**
	Urban	11(36.7%)

SECTION – B

FINDINGS RELATED TO COMPARISON OF PRETEST AND POST TEST KNOWLEDGE SCORE

This section describes the frequency and percentage distribution of pre-test& post test scores of housewives.

Table 4.2: Comparison of frequency (f) and percentage (%) distribution of pretest & post-test knowledge score of health workers regarding MDR&XDR-TB.

N=30

Level of score	Pre-test f & %	Post test f & %
Inadequate	15 (50%)	0 (0%)
Moderate	15 (50%)	12 (40%)
Adequate	0 (0%)	18 (60%)

Table 4.3: Comparison of pre-test and post-test knowledge score of health-workers.

N=30

Descriptive Statistics	Mean ±S. D	Mean%	Range	Mean diff.	Paired T-test	P value	Table value at 0.05
Pretest knowledge	10.53±1.167	35.10	8-12	10.600	52.698 ***	<0.001	2.05
Post test knowledge	21.13±1.479	70.40	19-24				
Maximum Score= 30							**Minimum score=0**

Table 4.4: Comparison of pre-test and post-test knowledge score of healthworkers

N=30

	EFFECTIVENESS OF STP					
Mean%	Pre-Test Knowledge	Post Test Knowledge	Difference	Pre-Test Knowledge Score %	Post-test Knowledge Score %	Difference%
Average	10.53	21.13	10.60	35.11	70.44	35.33
Maximum Score =30				**Minimum Score=**		**0**

The effectiveness of an educational intervention can be evaluated by comparing pre-test and post-test knowledge scores. In this case, the average gain in knowledge is 10.60 percentage points. Before the intervention, participants had an average pre-test knowledge score of 35.11%, which increased to an average post-test knowledge score of 70.44%, resulting in a gain of 35.33 percentage points. This substantial improvement demonstrates the positive impact of the educational intervention on enhancing participants' understanding and retention of the material. The increase in knowledge scores indicates that the intervention was successful in bridging the gap between initial knowledge levels and desired proficiency, ultimately leading to a significant enhancement in overall knowledge acquisition.

SECTION - C

Table 4.5 : Findings related to association between post-test knowledge score with their selected demographic variables of health workers on knowledge regarding MDR&XDR TB.

N=30

| Variables	PRE-TEST				POST- TEST			
	Chi Test	P Value	df	Table Value	Chi Test	P Value	df	Table Value
Age	1.869	0.600	3	7.815	1.590	0.662	3	7.815
Gender	0.000	1.000	1	3.841	0.089	0.765	1	3.841
Education qualification	2.191	0.334	2	5.991	1.033	0.597	2	5.991
Year of experience	3.400	0.143	3	7.815	2.476	0.480	3	7.815
Work setting	1.043	0.309	1	3.841	0.690	0.406	1	3.841
Job title	0.000	1.000	1	3.841	000.089	0.765	1	3.841
Monthly income	5.700	0.127	3	7.815	1.7710	0.621	3	7.815
Are you awar about MDR&XDR-TB	NA	NA	-	-	-	-	-	-
Any experience with TB patient	0.370	0.543	1	3.841	0.062	0.804	1	3.841
Area of residence	0.144	0.705	1	3.841	1.531	0.216	1	3.841
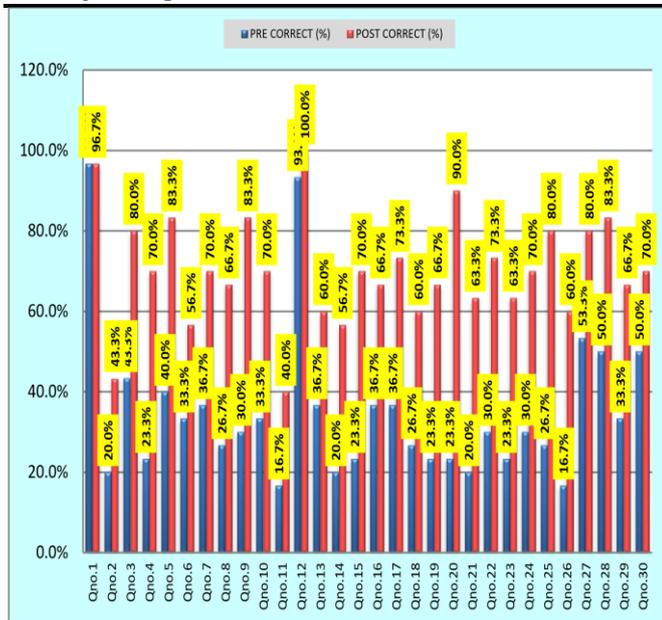
Fig.: Bar diagram representing Item wise analysis comparison of pre-test and post-test level of knowledge.

Discussion:

The findings of the study discussed were based on the objectives as:

To assess the effectiveness of STP on knowledge regarding MDR-TB and XDRTB among health workers in Balh block, Mandi (H.P)2023. The average post-test knowledge score stands at 21.13, with a standard deviation of 1.479, reflecting the spread of scores around this mean. Furthermore, the mean percentage score for the post-test knowledge is 70.40%. The paired T-test results reveal a significant difference in knowledge between the pretest and post-test phases. Before the intervention, the average knowledge score was 10.53±1.167 (35.10%), while after the intervention, it markedly increased to 21.13±1.479 (70.40%).

Hence, research hypothesis H₁ was accepted and null hypothesis H₀₁ was rejected.

Similarly **Kamlesh Joshil, Sharath S, Abid Mohammad** conduct "Planned teaching programme on prevention and treatment of Multi drug resistant and extensively drug resistant TB among staff nurses" aimed at development of planned teaching program for assessing the knowledge of 80 staff nurses in S.S.S.B. Govt. Satellite and Late Sh. Khemraj Katara Govt. Satellite Hospital at Udaipur city, Rajasthan.In this study samples were drawn by using simple random technique method. Data was collected by using structured knowledge questionnaire. From the findings of the study it was found that the pre-test mean knowledge score was 16.66, post-test mean knowledge score was 23.96.

Dr. Navneet Kumar Sharma

One more study is conducted to assess the effectiveness of planned teaching programme on knowledge regarding prevention and treatment of multi drug resistance tuberculosis among health workerThe quasi experimental research study showed the effectiveness of Structure Teaching Programme on knowledge regarding prevention and treatment of multi drugs resistant TB among health workers in a selected health workers. A 60 health workers were selected using purposive sampling technique The level of knowledge during pre-test and post-test were compared to prove the effectiveness of Structure Teaching Programme using paired "t" test t=18.50*, t(29)= 2.756, (P=0.05).

Conclusion:

The study reveals that health workers initially had limited knowledge regarding MDR and XDR tuberculosis, with none demonstrating adequate understanding before the intervention. However, the structured teaching program significantly improved their knowledge, as evidenced by the substantial increase in post-test scores. The findings highlight the effectiveness of educational interventions in enhancing the knowledge of health workers on critical public health issues like MDR and XDR-TB. Moreover, the study found no significant association between socio-demographic factors and the improvement in knowledge, suggesting that the intervention was universally effective across different demographic groups. This underscores the importance of implementing such educational programs widely to equip health workers with the necessary knowledge to manage MDR and XDR-TB effectively.

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