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January - March 2015

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Contents

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By **Dr. Rajesh Shukla**

ISBN: 81-901846-1-X, Pb, vi+141 Pages

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This century will be the century of the brain. Intelligence will define success of individuals; it remains the main ingredient of success. Developed and used properly, intelligence of an individual takes him to greater heights. Ask yourself, is your child intelligent! If yes, is he or she utilizing the capacity as well as he can? I believe majority of people, up to 80% may not be using their brain to best potential. Once a substantial part of life has passed, effective use of this human faculty cannot take one very far. So, parents need to know how does their child grow and how he becomes intelligent in due course of time. As the pressure for intelligence increases, the child is asked to perform in different aspects of life equally well. At times, it may be counter-productive. Facts about various facets of intelligence are given here. Other topics like emotional intelligence, delayed development, retardation, vaccines, advice to parents and attitude have also been discussed in a nutshell. The aim of this book is to help the child reach the best intellectual capacity. I think if the book turns even one individual into a user of his best intelligence potential, it is a success.

PEDIATRICS COMPANION

By Dr. Rajesh Shukla

ISBN: 81-901846-0-1, Hb, VIII+392 Pages

Price: Rs.250/-, US$50

Published by **World Informations Syndicate**

This book has been addressed to young doctors who take care of children, such as postgraduate students, junior doctors working in various capacities in Pediatrics and private practitioners. Standard Pediatric practices as well as diseases have been described in a nutshell. List of causes, differential diagnosis and tips for examination have been given to help examination-going students revise it quickly. Parent guidance techniques, vaccination and food have been included for private practitioners and family physicians that see a large child population in our country. Parents can have some understanding of how the doctors will try to manage a particular condition in a child systematically. A list of commonly used pediatric drugs and dosage is also given. Some views on controversies in Pediatrics have also been included. Few important techniques have been described which include procedures like endotracheal intubations, collecting blood samples and ventilation. I hope this book helps young doctors serve children better.

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Pediatric Education and Research
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Malnutrition and Millennium Development Goals in Post-2015 UN Development Agenda

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Health is the most important key to development. Health related issues play important roles as well in the current Millennium Development Goals (MDG) framework, with three out of the eight goals directly dealing with health conditions[1]. The eight Millennium Development Goals are: 1. Eradicate Poverty and Hunger; 2. Universal Primary Education; 3. Gender Equality and Empower Women: 4. Reduce Child Mortality: 5. Improve Maternal Health: 6. Combat HIV / AIDS, Malaria and Other Diseases: 7. Environmental Sustainability 8, and Global Partnership for Development

The MDG of halving the number of people suffering from hunger is within a reach. However, 162 million young children are still suffering from chronic undernutrition [2]. The double burden of malnutrition is a huge issue affecting developing and developed countries. Between 2 and 3 billion people are malnourished - they experience some form of undernutrition, are overweight or obese, or have some sort of micronutrient deficiency [3]. "Nutritional deficiencies" are responsible for over 50% of years lived with disability in children age four and under [4]. Malnutrition is the largest single contributor to disease in the world. Maternal and child undernutrition account for 11% of the global burden of disease [5]. Only caloric intake does not equate to nutritional value, which are necessary for fetal and early childhood physical and intellectual development, and threaten the mother and baby's health during pregnancy (MDG 4 and 5). Infants born to mothers who are poorly nourished are more likely to be underweight and become genetically predisposed to malnourishment. Inadequate nutrient intake leads to children being less productive at school and at home, and even increasing absenteeism (MGD 2). This means they will contribute less to household income through physical labor (i.e. among farming communities) and miss out on opportunities for higher education and future employment (MDG 1).

Overweight is an increasing problem. In absolute numbers there are more overweight and obese children living in low and middle-income countries (LMICs) than high-income countries. The prevalence of infant, childhood and adolescent obesity is increasing in all countries, with most rapid rises occurring in LMICs. An estimated 42 million children were affected by overweight or obesity in 2013. In Africa, the estimated prevalence rate of child overweight and obesity of 8.5% in 2010 is projected to increase to 12.7% by 2020. In Asia, the 2010 prevalence rate of 4.9% equates to approximately 18 million children. If current trends continue, over 70 million infants and young children will be overweight or obese by 2025, the vast majority living in LMICs [6]. These countries have had high rates of child under nutrition and stunting, but now the rates of childhood adiposity are also rising rapidly. Unhealthy nutrition is one of the major causes of Non Communicable Diseases (NCDs). A failure to act to eliminate the obesity epidemic will have medical, social and economic consequences of major magnitude.

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Experience has shown that the poor nutritional value of diets among low-income countries is leading to co-morbidities that are straining global health systems, where diabetes for example has been shown to increase the risk of tuberculosis infection. So-called 'lifestyle diseases' are directly linked to the global disease burden through increased susceptibility to infections and weakened immune response. This means that morbidities associated with infections and the immune system can be significantly reduced through a much more preventative approach. Within the top 16 leading causes of death, high body mass index, iron deficiency and inadequate fruit and vegetable intake are all risk factors that can be addressed through a balanced diet. As nutrient intake represents "a causal bi-directional relationship", it is shortsighted if we do not look beyond the international poverty line standard of 2,100 daily calories consumption as a satisfactory standard for reducing suffering associated with poverty and hunger. Calories alone are not an acceptable measure of *nourishment*.

This proposed revision includes addition of specific targets for reaching minimum nutritional intake of specific necessary and essential vitamins and nutrients from natural sources. While humanitarian aid efforts have been made to distribute nutritional meal supplements for young (usually under-5s or pregnant women), these are not adequate interventions. National education and awareness programs need to integrate the importance of balanced diets, fruit and vegetable consumption, as well as exercise. Food and beverage producers, farming industries and import/exporting agencies must work within new global standards for ensuring that all counties have access to affordable sources of nutrition for a balanced healthy diet. Food quality can leave a permanent imprint on physical and mental growth, which will affect the economy as a result. Good nutrition status improves intellectual capacity in children and adults and therefore is essential for sustainable development. Prevention of under nutrition in early childhood leads to wage rates that are 48% higher; individuals who are 33% more likely to escape poverty; and women who are 10% more likely to own their own business [7]. Investments in nutrition have high returns. GDP totals in Africa and Asia are less than 90% of what they would be in the absence of undernutrition, and in China, approximately 95% of what they would be in the absence of obesity. There have been estimated new benefit-cost ratios for scaling up nutrition interventions in 40 countries. Across these 40 countries, the medi-an benefit-cost ratio is 16 for every dollar, rupee, birr, or peso invested, at the median more than 16 will be returned, which is highly competitive with investments in roads, irrigation, and health [3].

We would like to put a list of sub-goals

a. Advocate breastfeeding and ameliorate maternal nutrition
b. Improve countrie's capacities to collect, monitor and report nutrition data
c. Invest in appropriate micronutrient treatment by food supplementation and fortification
d. Promote and improve food education
e. Make nutritious food more accessible to everyone

The global nutrition targets endorsed by the World Health Assembly in resolution WHA65/6 have been widely adopted by global initiatives [3]. There are number of high-quality case studies to demonstrate the success in the government level. The right to adequate nutrition and food is firmly recognized in a number of international human rights instruments. By implementing policies that attain this right, state leaders can, therefore, fulfil an obligation and realize an investment opportunity at the same time [5,8]. When looking at malnutrition data, it is important to take into account the local con-text in any level-geography, local governance, socioeco-nomic status, etc. Within the framework of MDG 1, it is a human right to have access to, and awareness of what a balanced and healthy diet should consist of. Proper immune response can significantly increase the chances of survival from common infections and communicable and non-communicable diseases. Through simple investments in education and food subsidies for fruits, vegetable, legumes and whole grains, offering alternatives to high-calorie and low-nutrient rich food, the burden on health systems will be significantly alleviated.

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Original Article

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Prevalence of Seizures in Children in Central India

Harish Agrawal*, Tushar Jagzape, Jayant Vagha***, Bhavna Lakhkar****, Amar Taksande*****

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Abstract

Background: Seizure is one of the common causes of childhood hospitalization with significant mortality and morbidity. There is limited data regarding the prevalence of seizures in children from the developing countries. *Aim & Objectives:* To find the prevalence of epileptic and non-epileptic seizures and the common etiology of seizures in various age groups presenting to tertiary care center in Central India. *Material & Methods:* This was a hospital based observational study carried out in the Department of Pediatrics, Acharya Vinoba Bhave Rural Hospital, Jawaharlal Nehru Medical College, Sawangi (Meghe), Wardha from 1st August 2012 to 31st July2014. All patients who were fulfilling the inclusion criteria within the age group of >28 days to 15 years were enrolled for the study. *Results:* A total of 169 patients were admitted for seizures with 115 (68%) males and 54 (32%) females. Among these patients, Maximum patients were in the age group between 1.1 year to 5 years of age (41%). the prevalence of epileptic seizures was 6.5/1000 population whereas the prevalence of non-epileptic seizures was 4.1/1000 population. Most common type were epileptic seizures (61.5%) followed by febrile seizures (25.5%) and Acute symptomatic seizures (13%).Generalized tonic-clonic seizures were the most common type of seizure presentation (59.2%). *Conclusion:* To conclude, with respect to the age and sex of patients, the prevalence of epilepsy in our region is not so much different from that of patients in other parts of the country.

Introduction

Seizure is a common problem evaluated in paediatric emergency departments [1]. A seizure is defined as transient, involuntary alteration of consciousness, behaviour, motor activity, sensation, or autonomic function caused by an excessive rate and hypersynchrony of discharges from a group of cerebral neurons. A postictal period of decreased responsiveness usually follows most seizures, in which the duration of the postictal period is proportional to the duration of seizure activity [2]. Epilepsy is considered to be present when >2 unprovoked seizures occur in a time frame of > 24 hours[3].[3] Acute symptomatic seizures occur secondary to an acute problem affecting brain excitability such as electrolyte imbalance or meningitis. Remote symptomatic seizure is thought to be secondary to a distant brain injury such as an old stroke [3]. Febrile seizures are seizures that occur between the age of 6 and 60 months with a temperature of 38°C or higher, that are not the result of central nervous system infection or any metabolic imbalance, and that occur in the absence of a history of prior afebrile seizures [3]. The prevalence of epilepsy varies from 4 to 10 per 1000 population (the lower figures in developed countries, while the higher figures in developing countries) [4]. Majority of studies conducted in Asia, the age-adjusted prevalence of 10.2 per 1000 in Asian Turkey [5] was higher than both the age-adjusted prevalence of 6.6

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per 1000 and 9.8 per 1000 in the studies conducted in Turkey and Pakistan by Aziz et al [6]. This prevalence was much higher than the age-adjusted prevalence reported in studies conducted in India and China, where prevalence ranged between 2.2 and 4.4 per 1000.[7 8 9]

The incidence rates of febrile seizures in India are comparable to those in the developed world. The Yelandur survey [10] conducted in rural South India estimated the prevalence to be 3.28-5.71/1000 whilst the more recent Uttarakhand survey[11] found a prevalence of 2.27 per 1000 population. **This study was done to** find out the prevalence of epileptic and non-epileptic seizures in Central India and to determine the different etiological types of seizures.

Materials and Methods

The study was conducted at Department of Pediatrics, Acharya Vinoba Bhave Rural Hospital, Jawaharlal Nehru Medical College, Sawangi (Meghe), Wardha. It was an observational descriptive study which was conducted for a period of two years from 1st August 2012 to 31st July2014. The study was initiated only after obtaining permission from the Institutional Ethics Committee. All patients who were fulfilling the inclusion criteria i.e., Children with an episode of seizure or history of seizure irrespective of the etiology within the age group of >28 days to 15 years admitted in Pediatrics ward/ICU of Acharya Vinoba Bhave Rural Hospital, Sawangi, Wardha were enrolled for the study. The sample size was calculated by considering of prevalence of seizures as 6/1000 population[12] with 95% Confidence Interval and precision of 3%.The minimum value calculated was 136.

In total, we recruited 169 subjects. Detailed history including past history of any seizures and history of prior treament were noted. After noting the history, general and systemic examination was carried out and noted in the proforma.

Seizures were divided into two groups:

1. Epileptic seizures
2. Non-epileptic seizures

Epilepsy is considered to be present when >2 unprovoked seizures occur in a time frame of > 24 hours[3].

In epileptic seizures, we divided into following two categories:

a. *Idiopathic:* The cause of seizures not known.

b. *Secondary:* which were secondary to other diseases like cerebral palsy, neurodegenerative disorders, syndromic children, congenital malformations, and neurocutaneous syndromes, remote symptomatic seizures due to space occupying lesions, neurocysticercosis, and old stroke.

In Non-epileptic seizures we included:

a. Febrile seizures

b. Acute Symptomatic seizures like meningitis, encephalitis, acute vascular insult, metabolic problems. We included acute symptomatic seizures in non-epileptic group as they primarily need treatment of the underlying condition and anti seizure drugs are required for a shorter duration of time [13].

After a complete clinical examination , cases had undergone investigations like complete haemogram, ESR, Serum Calcium, Blood Sugar, Blood Urea, Serum Creatinine, Liver function tests, Lumbar puncture, Serum electrolytes, Chest radiograph PA view wherever indicated.

Relevant investigations like computed tomography (CT) scan, Magnetic Resonance Imaging (MR) and EEG were advised when necessary.

Antiepileptic treatment was started according to the Guidelines for Management of Pediatric Epilepsy by IAP [14]. In case of febrile seizures, intermittent clobazam therapy was advised. The data was arranged in Microsoft excel sheet and various percentages were calculated and statistical analysis was performed using the statistics software SPSS for windows (17.0 SPSS, Chicago). Appropriate tests of significance were applied.

Results

Maximum patients were in the age group between 1.1 year to 5 years of age(41%) with mean age being 3.1 years followed by the age group between 5.1 year to 10 years of age(23%) with mean age 7.8 years. Out of total 169 patients, 68% were males and 32% were females with a ratio of M: F =2.1:1. We found that the prevalence of epileptic seizures was 6.5/1000 population whereas the prevalence of non-epileptic seizures was 4.1/1000 population. Most common type were epileptic seizures (61.5%) followed by

febrile seizures (25.5%). Acute symptomatic seizures were found to be 13% in the study. Secondary epilepsy (53%) was frequently observed than idiopathic epilepsy (47%). In febrile seizures, simple type (60.5%) was more common than complex (39.5%). Most frequently presented seizure was GTCS type (59.2%).Partial seizures were found to be 18.8% in our study. Table 1 shows the demographic data of children presenting seizure. Sodium valproate was the most frequently prescribed drug in GTCS (44.2%) , Tonic

Table 1: Demographic data of children presenting with seizure

Age Group(yrs)	No of children	Percentage (%)
>28 days -1 yrs	28	16.57
1.1 – 5 yrs	69	40.83
5.1 – 10 yrs	39	23.08
>10 yrs	33	19.52
Total	169	100.00
Gender		
Male	115	68.05
Female	54	31.95
Total	169	100.00
Etiology of Seizure		
Epileptic	104	61.5
Febrile	43	25.5
Acute symptomatic	22	13.0
Total	169	100
Seizure Presentation		
GTCS	100	59.2
Tonic	19	11.2
Clonic	4	2.4
Atonic	2	1.2
Myoclonic	6	3.6
Absence	1	0.6
Simple partial	19	11.2
Complex partial	13	7.6
Partial Seizure with secondary generalization	1	0.6
Unclassified	4	2.4
Total	169	100.0

(50%), myoclonic (83.3%), absence (100%), partial seizures with secondary generalisation (100%) and unclassified type (75%).Carbamazepine was used more often in clonic type (75%), simple partial (52.6%).

Discussion

Seizures are the most common paediatric neurologic disorders, occurring in almost 10% of children[3]. Childhood seizure is one of the most important causes of attending medical centres, especially emergency departments, and can be a cause of morbidity and disability in childhood. Age plays an important role in the etiology of seizures. 4 -10% of children suffer atleast one seizure in 1st 16 years of life [2]. In the present study, maximum number of patients were in the age group between 1.1 year to 5 years of age(41%) with average age being 3.1 years.

Various other studies have also found that seizures were maximum in the age group 1.1 to 5 years. Baheti et al [15] in Rajasthan also reported the maximum number of patients (41%) were in age group between 1.1 year to 5 years of age with average age 3.5 years which is similar to our study. A study conducted by Ashraf M et al [16] in Kashmir also reported the maximum number of patients (48%) in this age group which is comparable to our study. The percentage of male children was comparable to the study by Ashraf M et al [16] which was conducted in Kashmir, where percentage was 63%.

A study done in Karnataka by Joseph et al[17] reported the similar percentage (65%) of male patients in pediatric age group.One of the reasons for the above observation could be due to febrile seizures which are more common in males [18]. The Yelandur survey also found that there was a male preponderance (72%) in cases with active epilepsy [12]. Selena H Banu et al [19] also reported the similar findings where 65% patients were male with a male: female ratio of 1.85 which is in concordance with our study. The total prevalence of seizures was calculated to be 10.6 per 1000 population. The prevalence of epileptic seizures was found to be 6.5 / 1000 population whereas the prevalence of non epileptic seizures was 4.1 / 1000 population.

The World Health Organization (WHO) regards epilepsy prevalence as an indicator of countries Development [20]. A recent meta-analysis of published and unpublished studies puts the overall prevalence rate of epilepsy in India at 5.59 per 1,000 population, with no statistically different rates between men and women or urban and rural residence which is in concordance with our study[12]. Sridharan and Murthy reported overall prevalence of 5.3 / 1000 population; in urban population it was 5.1 / 1000 whereas in rural it was reported to be 5.5 / 1000 population[21]. This rate is surprisingly similar to that in developed nations. The CRESS study in Andhra Pradesh showed a prevalence rate of 6.2 per 1000 population[12].The prevalence in Kerala, a more developed state with high awareness of health related issues, is 4.3 per 1000 population[7]. A recent rural epilepsy surveillance program from Uttarakhand showed a prevalence rate of two or more unprovoked seizures to be 7.5 per 1000[11]. A Pediatric study from Kashmir valley shows prevalence rates of 3.74 / 1000 in males and 3.13 / 1000 in females[22]. A study conducted in Kolkata's urban population showed an annual incidence rate of 27.27 per 100,000 per year[23]. The prevalence of epilepsy in the Kolkata study is similar to that obtained in earlier Indian studies[24]. In the present study, the prevalence of non-epileptic seizures i.e., febrile seizures and acute symptomatic seizures was 4.1 / 1000 population. Earlier Indian studies [12] suggested the prevalence of febrile seizures as 3% of all hospital admissions but the Yelandur survey[10] estimated the prevalence to be 3.28-5.71 / 1000 which is comparable to our study whilst the more recent Uttarakhand survey p[11] found a prevalence of 2.27 per 1000 population.

There is limited number of studies on epidemiology of acute symptomatic seizures. Saravanan [25] conducted a study in South India and reported 20% of the patients with acute symptomatic seizures. This finding is similar to our study where we got a prevalence of acute symptomatic seizures as 13%. A population based study done in Taiwan [26] reported the incidence of acute symptomatic seizures to be 0.46 per 100 population comparable to our findings. Worldwide, febrile seizures are the most common type of acute seizures in children[27]. In a recent study conducted by Saravanan [25] in Tamil Nadu, they reported the epileptic seizures as 33%, febrile seizures 37% and symptomatic seizures 20%. Adhikari et al [28] in their study of 551 children from Western Nepal also observed seizure disorder as 33.6%, febrile seizures 30.5% and symptomatic in 25% patients. These findings were not comparable to our study. The disparity in findings could be due to the fact that patients of febrile seizures are generally taken care of by private practitioners and our centre being a tertiary care, we get more cases of epilepsy mostly referred from peripheries.

In our study, GTCS was the most common type of seizure (59.2%), irrespective of the underlying etiology (epileptic or non epileptic) followed by simple partial (11.2%) and complex partial seizures (7.6%). In the literature available it is noted that generalized tonic clonic, (GTCS) seizures are the most common type of childhood seizures, occurring in almost 61% of cases [29]. which is in concordance with our study. Poudel P et al [30] also reported GTCS as the most common type 58.4% followed by simple partial 5% and complex partial 7.8% which is comparable to our study. Mistry et al [31] reported that sodium valproate was the frequently presecribed drug for generalised seizures and unclassified seizures whereas carbamazepine was used more frequently in partial seizures. These findings were comparable to our observations.

Conclusion

In this study we find a higher frequency of epilepsy than febrile seizures and acute symptomatic seizures.

The prevalence of epilepsy in our region is not so much different from that of patients in other parts of the country.

Limitations

It was a hospital based study so the actual prevalence of seizures in children might be higher than our findings. Details of other causes contributing for seizures like inborn error of metabolism, associated development delay like genetic causes could not be specified due lack of investigations.

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Orginle Article

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Evaluation of Revised National Tuberculosis Control Programme, District Kangra, Himachal Pradesh, India - A Revised Version

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Abstract

Background: The present evaluation study has been conducted with the following objectives: (i) To assess the treatment outcomes of Revised National Tuberculosis Control Program (RNTCP) in five microscopic centers of Kangra district under five tuberculosis units and (ii) To identify gaps and underlying contributing factors. Based upon the findings of (i) and (ii) we suggest appropriate measures to narrow down the existing gaps. *Materials and Methods:* We identified and interviewed health personnel involved, reviewed the documents and records pertaining to evaluation plan / guidelines, training records and reports generated by five tuberculosis units. We assessed the inputs, processes and outputs of the program across five tuberculosis units. We calculated the proportion of staff of various categories trained and internal quality control (case detection); availability of drugs, Directly Observed Treatment Short- course (DOTS) providers and supervision (case management) and Information, Education and Communication (IEC) and funds distribution. (Logic model) *Result:* Around 60% to 88% of staffs of various categories trained with overall 25% gap of supervisory visits. In Tuberculosis Unit (TU) Nurpur the discordant slides while cross-checking were 8% and 25%. The total proportions of sputum positivity are 5.1%; the highest in Kangra-2.3% (National norms of 10%-15%). There was no full cross checking of the positive slides despite internal quality in place. Increased numbers of the extra pulmonary tuberculosis in young cases (EPTB) are present in all TUs, as high as 61% in TU Dharamshala (Normal range 15%-20%). A gap of 20% DOT centre exists- the least in (58%) in TU Nurpur. The awareness level in the TU Dehra is minimum (51%); more so in adolescent females and rural set up.. *Conclusion:* RNTCP has successfully achieved all its targets in all the five TUs of Kangra District as per national norms despite several gaps. We recommend (i) filling of vacancies of medics and paramedics with re-orientation trainings / refresher courses; (ii) conduction of supportive supervision by the seniors; (iii) investigation of cause of increased number of the extra pulmonary cases in adolescent and young ages and (iv) need of aggressive IEC activities.

Keyword: Extra Pulmonary Tuberculosis; Kangra; RNTCP Tuberculosis Unit.

Introduction

Tuberculosis is as old as mankind and is mentioned in Vedas and Ayurvedic Samhitas. *Caries* spine has been found in Egyptian mummies in 3500 B.C. Robert Koch demonstrated that it was caused by the bacillus, called as Mycobacterium tuberculosis (Koch' bacillus) [1]. The World Health Organization (WHO) has identified 22 high-burden Tuberculosis countries which collectively contribute 80 percent of the global burden of tuberculosis (TB). Tuberculosis is responsible for 5% of all deaths worldwide and

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9.6% of adult deaths in the 15-59 years old-economic productive age groups[2]. Tuberculosis kills more women worldwide than all causes of maternal mortality. The case fatality rate of tuberculosis is high; approximately 50% of untreated cases die of the disease. One out of every three HIV / AIDS patients has TB. The latest WHO report on the global status of Multi-Drug Resistant Tuberculosis (MDR-TB) lists Henan Province, China as a "hot spot" for its high number of MDR-TB cases. Around 5.3% of new TB cases in China are multi-drug resistant.

Asia carries the largest number of TB cases worldwide. Out of the 22 high-burden TB countries reported by the WHO, 10 are in Asia [3]. Three-fourths of TB patients in Asia develop active TB during their most productive years between the ages of 15 and 54 years old. India has the largest number of TB cases in the world, accounting for nearly one-fifth of the global burden [4]. In Himachal Pradesh, tuberculosis is quite wide spread in the poor socio-economic classes and the slum areas where women are the most sufferers. In the state, it occupies the seventh place (3.61%) in the women from the top 10 leading causes of the diseases [5] while in district Kangra; it is numbered on third place as 3%. So it is one of the diseases of the public health importance in the district which needs to be studied in detail and evaluated all-round [6]. The key of this strategy is to cure TB through Directly Observed Treatment at a time and place convenient to the patient [7]. Case finding is passive detection by means of a patient-friendly and clinically efficient service based primarily on smear microscopy. The present evaluation study has been conducted with the following objectives: (1) To assess the treatment outcomes of RNTCP in five microscopic centers of Kangra district under five tuberculosis units and (2) to identify gaps and underlying contributing factors. Based upon the findings of 1 and 2, we suggest appropriate measures to narrow down the existing gaps.

Materials and Methods

Engaging all stake holders

All the stakeholders were first identified and their opinion, suggestions and consensus were obtained for this evaluation of RNTCP project through personal meetings and group discussions; with the chief medical officer, district tuberculosis officer, medical officer tuberculosis and medical officer and senior treatment supervisor / senior treatment laboratory supervisor. Through personal visits and group discussion details of the evaluation project was shared such as, (1) Evaluation objective (2) Evaluation issues under assessment (3) Methodology to be adopted for the evaluation (4) Data collection methods (5) Data analysis and (6) Dissemination of results.

In-depth interviews using semi-structured questionnaires were developed for different health officials such as, Chief Medical Officer (CMO), District Tuberculosis Officer (DTO), Medical Officer Tuberculosis Center (MOTC), Senior Treatment Supervisor (STS), Senior Treatment Laboratory Supervisor (STLS), laboratory technician at the MC, and DOTS provider at the DOT center. We interviewed them during the study. We discussed the different parameters / indicators of the RNTCP programme with all the stake holders and also about the selection of the tuberculosis units and microscopic units.

Description of the RNTCP Program

Review of the documents

We reviewed the following documents on Tuberculosis: India RNTCP status report prepared by the Government of India, Directorate General of Health Services, Ministry of Health and Family Welfare, New Delhi. Tuberculosis India RNTCP performance report 2006; Operational Manual for District Tuberculosis Units; Operational Manual for Medical Officers tuberculosis; Operational Manual for STLS / STS; Reporting formats for DTC / TU (New case detection, sputum conversion, cure rate and Personal Medical Records Information (PMRI) Peripheral Health Institution (PHI) report forms.

Evaluation of the Program

Study Area:- District Kangra

The total population covered under RNTCP in the year 2001 was 13, 38,536 (Census 2001). The population has been divided in five Tuberculosis Units and 28 microscopic centers plus one microscopic centre conducted by Tibetan Delek hospital, Dharamshala-supervised by five STS (Senior Treatment Supervisor) and five STLS (Senior Tuberculosis Laboratory Supervisor). Five microscopic centers were selected for evaluation of the DOTS program. (1) DTC, Dharamshala, (2) Designated Microscopic Center (DMC) Kangra, (3) Designated Microscopic centre Dehra, (4) Designated Microscopic Centre), Nurpur and (5) Designated Microscopic Centre, Palampur under the Tuberculosis Unit Dharamshala, Kangra, Dehra, Nurpur and Palampur respectively [8].

One microscopic centre was chosen from each of the five tuberculosis units at random for the study viz., Dharamshala, Kangra, Dehra, Nurpur and Palampur of Kangra district, Himachal Pradesh. Ten cases from each microscopic centre of corresponding TU were selected from 2nd quarter to fourth quarter 2006 by lot method. In all 50 new slides positive patients were selected under the DOTS programme. These TUs were selected for study just because they are performing satisfactorily.

Data sources

Data sources were primary data collection and the secondary data available from the records.

Data collection techniques and tools

1. Quantitative methods

Review of registers and records (Tuberculosis register, laboratory register, treatment cards) and Logic model for evaluation carrying three parts: *Case detection, Case management and Information, Education and Communication (IEC)* under RNTCP.

2. Qualitative methods

In depth interview using semi-structured questionnaires to District Tuberculosis Officer, Medical Officer Tuberculosis Center, Senior Treatment Supervisor, Senior Treatment Laboratory Supervisor, Laboratory technician at the DMC, and DOTS provider at the DOT center. They were interviewed during the study. Apart from the health officials, 50 patients who had completed treatment were selected from 2nd quarter to fourth quarter 2006 to check the consistency of the reports and actual outcome.

Observation

Different level of health institutions likes, District TB center, Microscopic center, DOTS Center and Tuberculosis patient's house have been visited during the study to understand the structure of RNTCP, its functioning at different levels and ultimately the treatment outcomes i.e. the cure rate, sputum conversion rate and annualized case detection rate with the use of checklist (Annexure 1, 2) and semi-structured questioner.

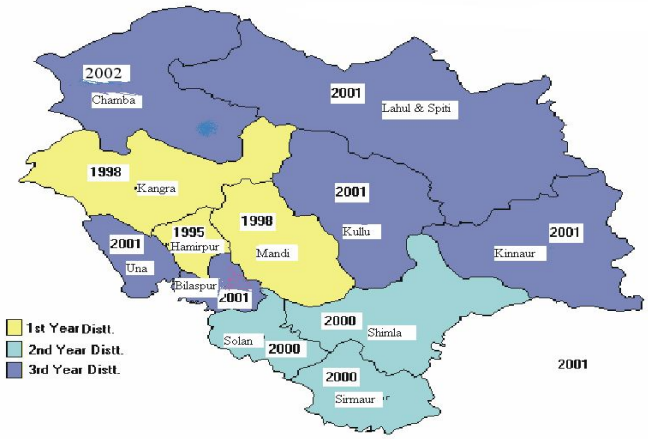
Data analysis

Data generated was analyzed by use of computer using Epi info and Excel.

Description of RNTCP

Background: RNTCP was implemented in Himachal Pradesh in phased manner. Out of twelve districts Hamirpur was the first District where RNTCP was implemented in 1995, *followed by Kangra and Mandi in 1998.* These three districts are collectively called as *1st year district.* Shimla, Solan and Sirmaur have started the programme from 1st July 2000. These three districts are collectively called as *2nd year districts.* Out of remaining six (collectively called as *3rd year districts)* districts Lahaul and Spiti, Una and Kullu have started service delivery from first quarter of 2001 and Bilaspur in the 2nd quarter of 2001.Kinnaur and Chamba have also started service delivery in December 2001 and January 2002 respectively.

Fig 1: Status of RNTCP implementing District in HP



Source: Directorate of health services Himachal Pradesh

RNTCP in State and Kangra District

Structure

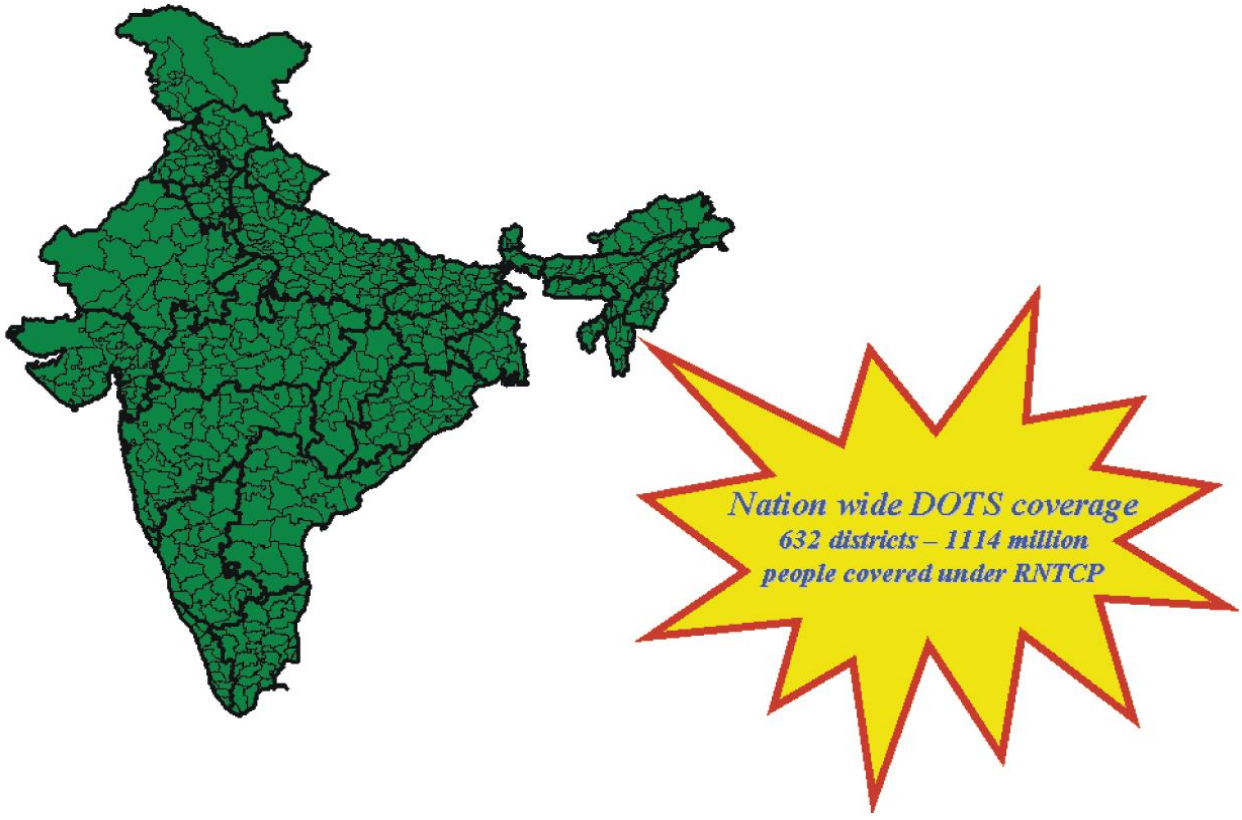
State level: At state level, the *State Tuberculosis Officer* (STO) is responsible for planning, training, supervising and monitoring the programme in the state. He is responsible administratively to the State Director of Health Services and technically follows instructions of the Central TB Division.

District Tuberculosis Centre level

RNTCP had been started in the Kangra district since October, 1998. The district tuberculosis officer (DTO) at the DTC has the overall responsibility of the programme at the district level and is assisted by a Medical Officer, a statistical assistant and other paramedical staff. District Tuberculosis Control Society with the District Collector as the Chairman, DTO as Member Secretary, with governmental and non-governmental representatives has been created and made functional. It is responsible for monitoring the programme implementation, arranging necessary logistics such as transport and procuring materials such as laboratory consumables.

Tuberculosis unit level: A team comprising a specifically designated Medical Officer-Tuberculosis Center (MO-TC), Senior Treatment Laboratory Supervisor (STLS) and Senior Treatment Supervisor (STS) are based at a sub-divisional level i.e. the Tuberculosis Unit (TU) level. The team constitutes the Tuberculosis Unit, and the STS and STLS are under the administrative supervision of the DTO. The STS is responsible for accurate maintenance of the tuberculosis register and timely submission of quarterly reports along with monitoring and supervision at the TU level.

DOTS Implementation Status by District, India
31st March 2006



Data analysis

Data generated was analyzed by use of computer using Epi info and Excel.

Results

Evaluation of RNTCP

The findings of study are briefly listed. We took one microscopic centre each at random, from 5

tuberculosis units for evaluation, the results of which are shown in the following logic model tables 1, 2 and 3. Under *case detection evaluation,* in all five TUs / DMCs, proportions of the trained medial officers are 88% with a gap of 12% excepting the medical officers TC (60%) with a further gap of 40%; laboratory technicians-80% with a gap of 20% and 10% gap of health workers. It has superimposed 25% gap of supervisory visits. Around 70% training sessions have been conducted. The laboratory equipments and reagents are in plenty supply in all TUs. The poor performing Tuberculosis Unit Nurpur has the discordant slides while cross checking as 8% and 25%. The total proportions of sputum positivity are 5.1%; the highest in Kangra-2.3%. There was no full cross checking of the positive slides despite internal quality in place. Increased numbers of the extra pulmonary cases are present in all TUs, as high as 61% in TU Dharamshala (Normal range 15-20%). Under *case management evaluation*, despite all five STS fully trained in TUs, abundance buffer stocks of the drugs and cards, a gap of 20% DOT centre exists- the least in (58%) in TU Nurpur. Around 96% of supervised treatment with median of 66% of supervisory visits has been conducted. Cure rate ranges in between 81% to 90% with the sputum conversion rate at 3rd month in between 91% and 97%. Under *IEC management evaluation,* sufficient IEC materials and funds of Rs. 108000/- for 5 TUs have been distributed. The awareness level in the TU Palampur is the highest (76%); more so in young males and urban set up while that of TU Dehra it is minimum (51%); more so in adolescent females and rural set up.

Discussion

This study was conducted for the evaluation of RNTCP in district Kangra from 2nd to 4th quarter, 2006. Its evaluation was based upon the quantitative logic model which consisted of three parts; *Case detection, Case management and IEC model.*

In the case detection evaluation, *in the input indicator,* in all five TUs 60% to 88% trained staffs of various categories; MO TC, medical officers, laboratory technicians and health care workers with overall gap ranging as low as 12% to as high as 60%. Shortage of the equipments, faulty microscopes and lack of the Continuation of Medical Education (CME) among the staff are the factors responsible for reduced number of the collection and examination of the slides, especially, in TU Palampur (0.88%). Overall on average, the supervisory visits done by the different officials in the given five TUs are 75%-a gap of 25% exists which needs to be bridged up either by new recruitment of the staff or stepped up facilitative supervision by the senior supervisors. *In the process indicator*, Out of 10 planned sessions of trainings only seven (70%) have been done-a gap of 30% while the proportions of the suspected slides referred to the microscopy are 1.53% which is less as compared to the normal of 2-3% of the programme. The overall proportion of the slides cross checked is 20% which is above the normal figure of 10%-15% but only in TU Nurpur the discordant slides were 8% and 25%. The laboratory technician has been found to be deficient in doing his technical work as reported by STLS and secondly, the MO TC had the dual responsibility of attending outdoor patients during day hours and also night emergency duty. He was also concurrently working as a part time MO TC, with the result the programme suffers. There are chronic shortages of staff of various cadres due to political interference in the shape of frequent transfers and deputations.

In the output indicator, The total proportions of sputum positivity are 5.1% as against the national norms of 10-15%. Despite the internal quality control in place, there is no full cross checking of the positive slides and 10%-20% of the negative slides by the STLS in any of the TUs of the district, especially in TU Nurpur. The reason for the same was the late posting of the STLS and a part time working MO TC. There is no external quality control by the accredited laboratory of the other states. The highest positivity rate of the district Kangra (2.3%) was because of presence of the government medical college in the district.

In outcome indicator, on account of further cross checking with 50 random cases, there was downward trend of the disease transmission which was reflected by minimal default, failure and mortality rates and so are the transferred out and relapse rates. Maximum death rate (13%) (National standards being 0%-7%) was in TU Palampur, especially in the rural belted villages. This was because of long vacancy of MO TC of TU Palampur for one year. Other important findings in all TUs are the increased number of the extra pulmonary cases, as high as 61% in TU Dharamshala as against the normal range of 15%-20%. The reasons for their higher detection need to be explored further.

Table 1: Logic Model for evaluation of Revised National Tuberculosis Control Program (RNTCP), District Kangra-Himachal Pradesh, India, 2007. (Case detection)

Levels of the logic model	Indicators	Data needed for the indicator	Source of data	Evaluation design	No. of TUs evaluated	Data collection Techniques	Tools
Input -Trained medical officers -Trained lab. -Technicians -Trained health care workers -Laboratory reagents/equipments -Internal Quality Control.	Proportion of the medical officers attending DOTS training (88%)	No. of medical officers attending DOTS training=194 Total no. of the medical officers=220	District training Records	Review of the records	DTC, 5 TUs	Interview of DTO	Training register
	Proportion of the lab. Technician attending DOTS training (80%)	No. of the lab. Technician attending DOTS training=35 Total no. of the lab. Technicians=44	District training Records	Review of the records	DTC, 5 TUs	Interview of DTO	Training register
	Proportion of the health care workers attending DOTS training (89%)	No. of the health care workers attending DOTS training=653 Total no. of the health workers=727	Block/district training records	Review of the records	DTC, 5 TUs	Interview of DTO	Training register
	No. of the microscopic centres equipped with reagents, slides and microscopes (96%)	No. of the microscopic lab. having the facility for the microscope and reagents=28 Total no. of microscopic centres=29	District stock registers/records	Review of the stock registers.	DTC, 5 TUs	Interview of DTO, district health educator	Training register
	No. of supervisory visits for internal quality control (75%)	No. of the supervisory visits conducted=72 No. of the visits planned=95	District tuberculosis office records	Review of the records	DTC, 5 TUs	Interview of DTO, MO TC	Tour diary.
Process Trainings	No. of the trainings (70%)	No. of the trainings conducted=7 Total no. of the trainings planned=10	District tuberculosis office records	Review of the records	DTC	Interview of DTO,	Training register
Sputum collection and examination Cross-checking of slides	Proportion of the suspected slides referred to the microscopy (1.53%)	No. of the slides referred to the microscopy=2158 Total no. of the suspected slides=140304	Health care facility OPD register	Review of the OPD Registers.	DTC, 5 TUs	Interview of DTO, MO TC	OPD and laboratory register
	Proportion of the slides cross-checked (20%)	No. of the slides cross-checked=1627 Total no. of collected slides=8051	Tuberculosis unit	Review of the records	DTC, 5 TUs	Laboratory technician	Laboratory register
Output Cases identified for sputum positivity	Proportion of the cases detected for sputum positivity (5.1%)	No. of the cases detected sputum positive=443 Total no. of the cases referred for the sputum microscopy=8586	Microscopic centre	Review of the lab. Register of the microscopic centre	DTC, 5 TUs	Laboratory technician	Laboratory register

Table 2: Logic Model for evaluation of Revised National Tuberculosis Program, Kangra-Himachal Pradesh, India, 2007 (Case Management)

Levels of the logic model	Indicators	Data needed for the indicator	Source of data	Evaluation design	No of TUs/MCs evaluated	Data collection Techniques	Tools
Input Drugs DOTS providers Senior treatment supervisors Treatment cards	Drugs available as per requirement (100%)	Drugs available=2510 boxes Drugs required=2505 boxes	Health care facility records/district records	Review of the records	DTC, 5 TUs	Interview of STS	Stock register
	No. of DOTS providers in position (79%)	No. of DOTS providers in position=358 Total no. of DOTS providers sanctioned=451	District tuberculosis office records	Review of the records	DTC, 5 TUs	Interview of DTO, STS	Staff position record
	No. of the senior treatment supervisor in position (100%)	No. of the STS in position=5 No. of the STS sanctioned=5	District tuberculosis office records	Review of the records	DTC, 5 TUs	Interview of DTO	District tuberculosis centre record
	No. of the treatment cards available (109%)	No. of the treatment cards available=600 Treatment cards required=550	Health care facility records	Review of the records	DTC, 5 TUs	Interview of DTO,STS	District tuberculosis centre record
Process Supervised treatment Supportive supervision	Proportion of the cases receiving the supervised treatment (96%)	No. of the patients receiving the supervised treatment=211 Total no. of the patients put on the treatment=220	Health care facility records/ Interview of the patients	Review of the records/interview of the patients	DTC, 5 TUs	Interview of STS, Patient	Patient treatment record, Dots provider
	No. of the supervisory visits (75%)	No. of the supervisory visits undertaken=72 Total no. of the visits planned=95	District tuberculosis office records	Review of the records	DTC, 5 TUs	Interview of DTO,MOTC	Tour dairy
	Number of the supervisory visits (75%)	Number of the supportive supervisory visits conducted=10 Number of the supportive supervisory visits planned=12	District records	Review of the records	DTC, 5 TUs	Interview of STS	Treatment register
Output The patients successfully	Proportion of the cases successfully completing the	No. of the patients successfully completing the treatment=168	District records	Review of the records	DTC, 5 TUs	Interview of STS	Treatment register

Table 3: Logic Model for Evaluation of Revised National Tuberculosis Program, Kangra-Himachal Pradesh, India, 2007 (IEC)

Levels of the logic model	Indicators	Data needed for the indicator	Source of data	Evaluation design	No. of TUs evaluated	Data collection Techniques	Tools
Input ▪ IEC materais, viz., banners, posters, pamphlets etc	No. of the health facilities having the Information, Education and Communication materials. (100%)	No. of the health facilities having the IEC materials=101 ▪ Total no. of the health facilities=101	District records	Review of records	DTC, 5 TUs	Interview of DTO, Health educator	
	▪ Proportion of tuberculosis funds allocated for IEC activities (100%)	Fund allocated for IEC (108,000) Total funds (Rs.108,000)	District records	Review of records	DTC, 5 TUs	Interview of DTO, MO TC.	Cash register
Process ▪ Display of the IEC materials	Proportion of the health facilities displaying the IEC materials (100%)	▪ No. of the health facilities displaying the IEC materials=101 Total no. of the health facilities=101	Health facility/District record	Review of records	DTC, 5 TUs	Interview of DTO, MOTC	Survey of the TUs, MCs.
	Proportion of the health facilities utilizing the funds for IEC (100%)	Number of the health facilities utilizing the funds for IEC=101 Total number of health facilities=101	Health facility/District record	Health facilities survey/Review of the records	DTC, 5 TUs	Interview of DTO	
Output ▪ Awareness about the symptoms and treatment of the Tuberculosis.	Proportion of the population who knows they should seek attention for a cough longer than 3 weeks and its treatment (61%)	No. of the persons who know they should seek attention for a cough longer than 3 weeks and its treatment=153 Population surveyed=250	Community	Randomly select one TU, and select one village	5 TUs	Interview villagers	Village people

Table 4: Interview / Treatment card / Laboratory Register / TB Register of patient registered in Quarter 4th, 2006, Kangra, Himachal Pradesh, India. (Mark 1 for Yes and 0 for No)

S. No	Indicator	P1	P2	P3	P4	P5	P6	P7	P8	P9	P10
	Interview of patient Check consistency between recorded patient information versus actual patient information (Carry treatment cards for interview)										
1.	Did the patient has any previous H/o treatment taken from the pt. practitioner/or X-rayed?										
2.	Is the patient aware that he/she is/was undergoing treatment for TB?										
3.	Did the patient complete/cure/default/fail/transferred out during the treatment?										
4.	Does the patient know the correct duration of treatment for his TB?										
5.	Did the patient take at least 20 of 24 doses under direct observation in the I P?										
6.	Did the patient take at least one dose in a week under direct observation in the CP?										
7.	Does the patient know that no taking drugs under direct observation can lead to unfavorable Rx outcomes?										
8.	Does the health worker pay any home visits										
9.	Is participating in DOT convenient to the patient? (In terms of DOT place, DOT provider DOT time)										
10.	Did the patient have to pay for sputum examination at the MC?										
11.	Did the patient have to pay for TB drugs after being registered in the RNTCP?										
12.	Did the patient mention that he provided at least two sputum samples before the start of treatment?										
13.	Did the patient mention that he provided at least two sputum samples at the end of two months of treatment?										
14.	Age of the patient(completed age in years)										
15.	Sex of the patient(M= male, F=female)										
16.	Is the patient Tribal?										
17.	Was the patient satisfied with the interaction and support provided by the programme staff										
	Check treatment card (check consistency of information between treatment and Lab register)										
18.	Is the patient's 2 month follow up sputum result on treatment card consistent with result and grade recorded in Lab register?										
19.	Is the patient's treatment regimen on the treatment card consistent with the categorization in the TB register?										
20.	As per the treatment card, is the patient reported to have been on DOT during IP? (at least 20 of 24 doses)										
21.	As per treatment card, is the patient reported to have been on DOT during CP (at least one dose a week)										
	Check Laboratory Register (Check consistency of recording between TB register and Lab register at the MC)										
22.	Treatment outcome of the patient as per the TB register (Cured/Completed/Died/Failure/Transferred/ Defaulted)										
23.	In the laboratory register, is there a record of the patient's initial sputum examination?										
24.	As per the Lab register, did the patient have at least two initial sputum samples examined before start of treatment										
25.	Is the result (including grade) in the Lab register consistent with the result in the TB register										
26.	Is there a record of patient's two-month follow up sputum examination in the Lab register?										
27.	Did the patient have at least two follow up sputum exams at the end of two months?										

In the case management

In the input indicator, despite abundance buffer stocks of the drugs and cards, a median 85% of the DOTS centers with a gap of 20% are there. Minimal DOTS centers (58%) are in TU Nurpur due to the political considerations. Five STS are present and fully trained. DOTS centres need to be activated to thefull strength. *In process indicator,* 96% of the cases are getting the supervised treatment. The number of the supervisory visits by the different health officers/officials lies in the range of 0% to 100%, the median being 66%. The lower down in the ladder of the health providers, the facilitative supervision and motivation/counseling also dwindles down owing to lack of communication and CME; rough and tough topography and shortage of the staff and skill. *In Output Indicator,* the successful completion of the NSP cases reflects in the range of 86% to 93%, the median being 89%. The social stigmas of tuberculosis; distantly set up DOT centers and side effects of the anti tubercular medicines in the form of nausea, skin rashes and a few cases of jaundice in the area are some of the reasons for the increased defaulter rate in TU Dharamshala (6%). *In Outcome Indicator,* the cure rate rolls in the range 81% to 90%; the lowest in TU Dharamshala as 81% (median being 86%) the sputum conversion rate at 3rd month lies in between 91% to 97% (median being 95%). So, finally we observed that the outcome/impact indicators are in consistence with programme targets of the RNTCP in district Kangra.

In the IEC management

In input indicator, all five TUs/DMCs have sufficient IEC materials and funds of Rs. 108,000/- to be equally divided among five TUs. *In process indicator,* sufficient IEC materials have been displayed in all 29 microscopic centres with Rs. 21,500/- spent for IEC activities from each TU. *In output indicator,* the awareness level in the TU Palampur is the highest (76%); more so in males and urban set up and the minimum being in TU Dehra (51%), adolescent females and rural set up [9].

Limitation of study

1. Sample population selected was very small.

2. Time spent on study was very small and limited.

3. Parameters chosen were many, like cure rate, defaulter rate, death rate etc. These may be dealt each in the separate study.

Conclusion

Despite several gaps identified as part of the evaluation such as (i) vacancies of medics and paramedics, (ii) Gaps in knowledge in health personnel, (iii) Insufficient supportive supervision by the seniors, (iv) increased number of the extra pulmonary cases in young and adolescent population, (v) Increasing defaulter rate; RNTCP has successfully achieved all its targets in all the five TUs of Kangra District as per national norms.

Recommendations

- Fill the vacancies of medics and paramedics. Re-orientation trainings/refresher courses need to be started for the medical officers and other para-medical staff.
- Medical officer of tuberculosis unit, senior treatment supervisor and senior treatment laboratory supervisor must be regularly supervised.
- Evolve a method to cross check the supervisory visit of the junior supervisors by the senior supervisors.
- Explore the causes for the increased number of the extra pulmonary cases in the Kangra district and that too in young and adolescent population.
- Patient should be counseled about the importance of directly observed treatment and so as to avoid the social stigma and humiliation, DOTS should be provided at home

by health providers, like multiple health workers/anganwari workers/village health guides.

Future scope of the study

Many studies are yet to be done in this field as this program is still in the evaluation period. Some suggested studies are:

- There should be a cross-sectional study on the hospital based data to evaluate sputum microscopy, prescribed drugs to all defaulters and relapse cases.
- To evaluate defaulter and relapse in RNTCP, a prospective study should be done.
- Adverse reaction of anti tubercular treatment may be a topic for the study.
- Sputum negative tuberculosis- Category should be studied in detail.
- Imbalance ratio of NSP: NSN needs further exploration in the district.
- Knowledge, attitude and perception status of general population and the contact cases of the patient is an important area of study.
- Causes of the defaulters and relapse cases may be studied in detail.
- The study on multi-drug resistance TB is to be done.

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Annexure-1

Checklist for a visit to Microscopic Center

Interview with laboratory staff
- How many staff works in the laboratory?
- Have they received the RNTCP training? When?
- Do they have RNTCP laboratory manual?

Smear request form
- How are smear requested and reported?
- Is the RNTCP smear request form used?

Sputum containers
- Are there adequate supplies?
- Are they marked properly (laboratory number on the side)?

Laboratory register
- Is the RNTCP laboratory register used?
- Is it up to date?
- Is it filled in completely?
- Do negative suspects have three negative smears?
- Do positive cases have two positive smears?
- Are positive results written in red?
- How many smears (diagnosis and follow up) were examined recently?

Slides
- Are there adequate supplies?
- Are slides marked with a diamond pen?
- Is the laboratory number marked properly on the slide?
- Check some positive and negative smears for smear preparation, staining, and correct reporting?

Reagents
- Are there sufficient quantities of reagents?
- Are bottles labeled correctly with name and date of preparation?

Microscope
- Type (binocular / monocular electric/ light) and its condition?

Quality control
- Are slides kept for quality control?
- Are there sufficient slide boxes?
- How often are slides sent for quality control?
- How are slides sampled for quality control?
- Has the laboratory received results of quality control?

Disposal
- Method of waste disposal (burial/ burning)?

Annexure-2

Check list for TB Clinic

Interview with patient

Interview with staff
- Who sees the patients in the clinic?
- Have they received the RNTCP training? When?
- Do they have RNTCP manual?
- How do they supervise treatment?
- Who does late patient tracing?

Treatment cards
- Are cards stored properly?
- Check correctness completeness, consistency and credibility?
- Check categories, treatment, and medicine taken?

TB Register
- Is it up to date?
- Check correctness completeness, consistency, and credibility?

- Compare with laboratory register; any pretreatment defaulters? Any discrepancies?
- Compare with treatment card – any discrepancies?

Cohorts

- Check reports prepared by treatment center staff?
- Prepare case finding, two-month conversion and treatment outcome cohorts?
- Any discrepancies?

Store

Medicines

- Are there adequate quantities of anti-TB medicines?
- Are medicines stored properly?
- Check expiry dates. Is a FEFO system used?
- Are stock cards kept up to date?
- Do the stock card match the actual stocks (check at least one medicine)?

Annexure-3

Form-1

Questionnaire for State Tuberculosis Officer

Name…… Designation…….....

Name of the State……..

No. of service years in this position…….. Date of Visit…….....

GENERAL

Q. When was the RNTCP started in State of Himachal Pradesh?

Q. What is the population under RNTCP?

Q. What were the reasons for developing RNTCP?

Q. What are the objectives of RNTCP?

Q. When was the last RNTCP training for Medical Officers and health workers organized?

Q. How many meetings do you hold with all the District Tuberculosis Officers to discuss administrative and technical matters pertaining to RNTCP implementation in a year?

Q. On what basis is the state quarterly analysis report prepared?

Q. How often do you review quarterly reports and send feed back to the districts.

Q. How often do you visit each implementing district in a year?

Q. How often does state health secretary review the programme?

Q. Is the RNTCP being implemented successfully in the state?

Q. In your opinion what further steps can make the programme more successful?

Form -1

Questionnaire for District Tuberculosis Officer

Name……..…… Designation…….....

Name of the State……..... Name of the District……..

No. of service years in this District…… Date of Visit…….....

Q. When was the RNTCP started in District Shimla of Himachal Pradesh?

Q. What is the population under RNTCP?

Q. What were the reasons for developing RNTCP?

Q. What are the objectives of RNTCP?

Q. When was the last RNTCP training for medical officers and health workers organized?

Q. How many technical and administrative review meetings do you hold with MO-TC and all STS/STLS in a year?

Q. How often do you visit Tuberculosis Unit of your district in a year?

Q. Is there documentary evidence of 2.2(e.g. trip report, diary)?

Yes ☐ No ☐

Q. How often do you visit the microscopic centers of your district?

Q. Is there documentary evidence of 2.4(e.g. trip report, diary)?

Yes ☐ No ☐

Q. How often does the District Magistrate review the programme and facilitates coordination with other sectors / programmes?

Q. How often does the Chief Medical Officer review the programme and facilitates?

Q. Has there been any drug stock out in the district in the past one year?

Q. Has there been any expiry of drugs in the district in the past one year?

Yes ☐ No ☐

Q. Is the RNTCP being implemented successfully in the state?

Q. In your opinion what further steps can make the programme more successful?

Form-2

QUESTIONNAIRE FOR MOTC in-charge of the TU

Name……..…… Designation…….....

Name of the District……..... Name of the TU…….....

No. of service years in this Institution…… Date of Visit…….....

General

Q. What is the population of the area served by this TU?

Q. What are the private health services available in the area?

Q. What are the numbers of beds in the institution?
Sanctioned In Position

Q. What are the numbers of outpatients for last one year?

Q. What are the major public health problems in the area served by the institution?

Q. What are the services available in the institution?

Q. What is the staff available in the institution?

Diagnosis of Tuberculosis

Q. What definition do you use for TB suspect?

Q. Where does screening of TB suspect take place?

Q. Who does the screening of TB suspect?

Q. How is the screening of TB suspect done?

Q. What routine investigation is ordered for TB suspects?

Q. How many sputum smear examinations are ordered for a TB suspect?

Q. Do people with respiratory symptoms use the private sector? If so how are they managed?

Treatment of TB

Q. Where does patient get their treatment?

Q. What treatment categories, regimens and dosage are used?

Q. Who directly observe treatment?

Q. What quantity of medicines is dispensed in the intensive phase?

Q. What quantity of medicine is dispensed in the continuous phase?

Q. Who gives patient education and counseling?

Q. How often are patients called for follow up during treatment?

Q. How often are smear examinations ordered during treatment?

Q. By whom, when and how is the late patient tracing done?

Q. Do patient with TB gets treatment in the private sector? What treatment regimen does private practitioner use?

Q. Is preventive therapy used, if yes for whom?

Recording and reporting

Q. Who maintains treatment cards and TB registers?

Q. Who prepares the quarterly reports?

Q. Is there a system for cross checking the TB registers with the laboratory register?

Training and Supervision

Q. When was the last RNTCP training for health workers in the institution?

Q. How often health workers trained?

Q. How often do RNTCP supervisors visit the institution?

Q. When was the last supervisory visit from the RNTCP?

Q. What do supervisors do on their visits?

Q. Do supervisors use a supervision checklist?

Q. Is feedback verbal or written provided by the supervisors?

Medicines

Q. How are anti TB medicines ordered?

Q. How often do supplies of medicines come?

Q. Are quantities sufficient?

Q. Has there ever been shortage of ant TB medicines?

Q. How many supervisory visits have you made in last one month to the Peripheral Health Institutions?

Q. What was the smear conversion rate reported for the TU in the lastquarter?

Q. What was the cure rate reported for the TU in the last quarter?

Form-3

Questionnaire for Medical Officer of The Mc

Name…… Designation…….....

Name of the District…….. Name of the TU…….....

No. of service years in this Institution…… Date of Visit…….....

General

Q. What is the population of the area served by this MC?

Q. What are the private health services available in the area?

Q. What are the numbers of beds in the institution?
Sanctioned In Position

Q. What are the numbers of outpatients for last one year?

Q. What are the major public health problems in the area served by the institution?

Q. What are the services available in the institution?

Q. What is the staff available in the institution?

Diagnosis of Tuberculosis:

Q. What is the definition used for TB suspect?

Q. Where does screening of TB suspect take place?

Q. Who does the screening of TB suspect?

Q. How is the screening of TB suspect done?

Q. What routine investigations are ordered for TB suspects?

Q. How many sputum smear examinations are ordered for a TB suspect?

Q. Do people with respiratory symptoms use the private sector? If so how are they managed?

Treatment of TB:

Q. Where does patient get their treatment?

Q. What treatment categories, regimens and dosage are used?

Q. Who directly observe treatment?

Q. What quantity of medicines is dispensed in the intensive phase?

Q. What quantity of medicine is dispensed in the continuous phase?

Q. Who gives patient education and counseling?

Q. How often are patients called for follow up during treatment?

Q. How often are smear examinations ordered during treatment?

Q. By whom, when and how is the late patient tracing done?

Q. Is preventive therapy used, if yes for whom?

Recording and reporting

Q. Who maintains treatment cards and TB registers?

Q. Who prepares the quarterly reports?

Q. Is there a system for cross checking the TB register with the laboratory register?

Training and Supervision

Q. When was the last RNTCP training for health workers in the institution?

Q. How often are health workers trained?

Q. How often do RNTCP supervisors visit the institution?

Q. When was the last supervisory visit from the RNTCP?

Q. What do supervisors do on their visits?

Q. Do supervisors use a supervision checklist?

Q. Is feedback verbal or written provided by the supervisors?

Medicines

Q. How are anti TB medicines ordered?

Q. How often do supplies of medicines come?

Q. Are quantities sufficient?

Q. Has there ever been shortage of ant TB medicines?

Q. Are you trained in RNTCP?

Yes ☐ No ☐

Q. Do you have a copy of any of the following documents?
1) Technical guidelines. 2) RNTCP at a glance. 3) Key facts and concepts. 4) Desk reference.

Yes ☐ No ☐

Q. What was the number of sputum smears examined last month in the MC and what percentages of them were positive.

Q. How often do you review patient treatment activities with Multi Purpose Worker?

Q. Have any irregular/defaulting patients brought back on treatment?

Yes ☐ No ☐

Form -4

Questionnaire for Sts at The Tu Level

Name……..…….. Designation…….....

Name of the District…….. Name of the TU…….....

Date of Visit……..

Q. How often do you visit each DOT center in your TU area?

Q. What do you do to bring irregular patient back on treatment?

Q. How often do you review patient treatment activities with Multi Purpose Worker?

Q. How do you maintain details of your field activities?

Form 5

Questionnaire for Stls at the Tu Level

Name……..…….. Designation…….....

Name of the District…….. Name of the TU…….....

Date of Visit……..

Q. How do you review the slides?

Q. How do you maintain details of your field activities?

Form -6

Questionnaire for Lt at The Mc Level

Name……..…….. Designation…….....

Name of the District…….. Name of the MC…….....

Date of Visit……..

General

Q. What are the numbers of staff working in the laboratory?

Q. What is the number of staff who does smear examination?

Q. What other investigations are done in the laboratory?

Q. What are number of sputum smears examined each day/month/year for AFB?

Q. Does the laboratory do any other investigations for TB (culture/sensitivity etc)?

Equipment and supplies

Q. What is the type of microscope and power supply the laboratory has?

Q. What is the condition of the microscope?

Q. How are supplies (sputum containers, slides, reagents, and chemicals) ordered?

Q. How often are they supplied?

Q. Has there been any shortage of supplies?

Q. Are there adequate supplies of reagents, slides and other consumables for the next one-month?

Q. Who prepares the reagents, how are they prepared and where are they prepared?

Q. Are reagents labeled?

Q. How long are reagents used for?

Q. Any problems with old reagents?

Sputum Collection

Q. Where do patients cough up their sputum specimens?

Q. Does any one observe them?

Q. Where is sputum collected in?

Q. How are sputum containers labeled?

Q. How many sputum specimens are collected for each TB suspect?

Smear preparation and examination

Q. Who prepares the smears?

Q. Who stains them?

Q. What stains are used?

Q. Who examines the smears?

Q. How long does it take to examine a negative smear?

Q. For the previous quarter, were three sputum smears done for 80% of the chest symptomatic? Count from the Lab register.

Yes ☐ No ☐

Q. For the previous quarter, were two sputum smears done for 80% of the follow up patients? Count from the Lab register.

Yes ☐ No ☐

Recording and reporting

Q. Do you have a smear examination form?

Q. Who fills it in?

Q. Do you have an RNTCP laboratory register?

Q. Who fills it in?

Quality control

Q. What quality control system do you have?

Q. Are slides kept for quality control after examination?

Q How do you preserve slides for review by STLS?

Q. How often are slides sent for quality control?

Q. Has the laboratory received any feedback on quality of smear examination?

Training and Supervision

Q. How often do laboratory technicians receive training from RNTCP?

Q. When was the most recent training by the RNTCP?

Q. Do you have a supervision system for the laboratory?

Q. When was the most recent supervisory visit?

Q. What is the importance of 3 sputum exams for diagnosis and 2 sputum exams for follow up?

Form - 7

Questionnaire for Dots Provider

Name..... Designation.....

Name of the District..... Name of the TU.....

Name of the PHC / CHC..... Name of the HSC.....

No. of service years in this area..... Date of Visit.....

General

Q. What is the population of the area served by the institution?

Q. What other public health services are in that area?

Q. What other private health services are in that area?

Q. What are the numbers of outpatients per year?

Q. What are the major health problems in the area served by the institution?

Q. What are the services available in the institution?

Treatment of TB

Q. Where does patient get their treatment?

Q. How do you maintain boxes for each patient?

Q. Who directly observe treatment?

Q. How do you mark the treatment cards at the time of giving each dose?

Q. How do patient receive every dose of drug during Intensive Phase?

Q. How do patient receive every dose of drug during Continuous Phase?

Q. When do patients bring back empty blister packs, when they collect weekly drugs?

Q. Check the consistency between number of doses on treatment card and drug box? Check any two boxes?

Box - 1 Yes ☐ No ☐

Box - 2 Yes ☐ No ☐

Q. Does the treatment observer make home visits to verify addresses of patient?

Yes ☐ No ☐

Q. Do you have clean water, disposable cups, and privacy for DOT patients?

Yes ☐ No ☐

Recording and reporting

Q. Who maintains treatment cards?

Q. At what dose in intensive phase are you supposed to give the sputum container for follow - up examination?

Q. How do you bring irregular patients back on treatment?

Q. How often are smear examinations ordered during treatment?

Training and Supervision

Q. When were you trained under RNTCP?

Q. How often do RNTCP supervisors visit the institution?

Q. When was the last supervisory visit from the RNTCP?

Q. What do supervisors do on their visits?

Q. Is feedback verbal or written provided by the supervisors?

Review Article

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A Light on The Literatures of Reaction Time from The Past Leading to The Future – A Narrative Review

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Abstract

Reaction time (RT) is the measure of how rapid the person responds to the given stimulus. Most of the literatures have used RT as one of the outcome measure in training neurologically intact children and adults to achieve excellence. Here we present the detailed narrative review about RT from various databases such as PubMed, ProQuest, OvidSP and EBSCO. From critical analysis of this narrative review, it is found that there is dearth in literature lacking the reference standards of RT among them.

Keywords: Attention; Children; Reaction Speed; Narrative Review; Ruler Drop Method.

Introduction

Reaction time is defined as interval of time between presentation of stimulus and appearance of appropriate voluntary response in a person[1]. It varies with number of possible valid stimulus, type, order and intensity of stimulus, arousal, age, gender, physical fitness, hand dominance, practice and error, fatigue, fasting, distraction, alcohol, finger tremor, stress, drugs, intelligence, learning disorder, brain injury, illness, personality type, accuracy in hearing and vision [1,2].

Lesser the reaction time it multiplies ones achievements in many areas such as, sports, academics, music, dance, driving, defense, etc. By identifying the person's reaction time, we can predict reacting abilities in the above mentioned situations. In case of children, this helps us to identify the children with prolonged reaction time and to identify the cause. Thereby individual attention can be given to these children at their younger age. Thus estimating the reaction time of children at their younger age is more prior.

In the human life the age between 6-11years are the rich years filled with growth and change and more remarkable changes in executive attention occurs between 6 and 8 years of ages where they make a move towards adult hood from their childhood [3,4]. At the age of six years the child shows remarkable shift in the cognitive skills [5]. Which includes perception memory, intuition, awareness, reasoning, attention, judgment, and initiation-termination of activities [6]. These cognitive changes transform the body and mind of a child along with biological and psychological changes [7]. So, if reaction time norms for children are estimated during these age span, identifying the children deviating from these norms would be made easy.

Reaction time of an individual is estimated clinically by computerized neuropsychological test [8]. But high cost and professional guidance in estimating reaction time makes this unavailable for the school children. Though mobile based android applications are available for estimating reaction time, but the restricted usage of mobiles at schools makes this as a tough task. Thus there is a desire

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need to develop reference standard norms for RT using simple instrument used in schools like Ruler.

Eckner et al validated his simple instrument for the estimation of reaction time [9]. But the instrument has ceiling effect and in case of children it might have major effect. To minimize this effect, Aranha et al have proposed a simple method to estimate reaction time by a ruler dropped at least a meter distance from the ground. They used a stainless steel meter ruler in the study to estimate the reaction time in the children [10].

This narrative review will help us in identifying the literature available on RT and what the literature lacks on with special reference to children.

Narrative Review of Literature

Reaction time (RT) is defined by various authors in multi ways. RT is a interval of time between presentation of stimulus and appearance of appropriate voluntary response in a person [1] also defined as the 'the interval of time between application of stimulus and detection of a response [11]. It measures the cognitive functioning of an individual [12-,14]. This reaction time mainly depends on the type, number and duration of possible stimulus [2].

The first clinical examination of RT was performed by a psychologist F.C. Donders in 1868. He defined RT as the Speed of Mental Processes and assessed by means nerve conduction velocity using 'subtractive method'. Here he gave electric shock to both feet of the subject randomly as a stimulus to infer how much time was needed for comparing the tasks, such as identification, comparison or other higher-level judgments. The subject responded to the stimulus by pressing the telegraph key with his left or right hand with respect to the leg in which the shock is received [11,14-16]. Many studies were carried out by different investigators to find RT by using Donders's subtractive method but the obtained RT was varied from person to person and laboratory to laboratory [14].

Later in the year 1930 the 'father of modern psychology' William Wundt, along with his students, extended the subtractive method into experimental psychology and also they found a new application where RT was evaluated once the stimulus was identified through which they measure the duration of mental processes, attention, memory, and the integration of the ideas. They estimated attention or apprehension span in the form of result [14,17].

In the year 1938 Julia from the University Minnesota found the relation of RT of 5 year old children to various factors by using Mill's reaction board with accessory key and she is aimed to find the speed of reaction to auditory stimulus in relation to their sex, intelligence and work status. In this study she selected 50 girls and 50 boys of age five year five month to five year seven month. During procedure the main board of apparatus was held by experimenter and the part was placed in front of the child. The Experiment was consisted with 25 trials in which the children were divided into of group of five trials and first three group of tests performed with the rest of 15 min; the fourth and fifth groups of tests conducted with the rest of 30 seconds each [18].

Sternberg et al introduced a new method for calculating RT known as 'additive factor method' to overcome limitation of Donders and other methods. It explains the stages of information processing. In this method the stimulus was given by a sequence of visually presented digits ranging from zero to nine. The subject will give either positive response or negative responses [14].

There was a major shift of cognitive behavior from operational orientation after the World War II. The philosophical adjustment leads to evolution of computerized batteries in calculation of RT in 1970-80s, hence these years are known as golden years [19,20]. Various studies were performed to evaluate RT by using computer.

In the year 1972 Spring et al performed a study Reaction Time in Learning-Disability and Normal Children. They estimated the RT of 22 children with poor reading and 22 children with normal reading, aged between seven to 12 years and IQ of 94 to 130 by pressing one switch of corresponding letter when two upper-case letters were presented simultaneously. 80 trials were given prior and again 40 trails were given after the rest of ten minutes. At last they concluded that the children with learning disability show longer RT when compared to normal children [21].

RT was also assessed by using the mobile phone with test battery installed. Kaisa Rolig in her thesis estimated the feasibility mobile phones in the calculation of RT. Now a day mobile became an important part of life hence it reduces cost effective for the subjects. The subject can repeat the measurement whenever required. But these measurements are varied from laboratory measurement with controlled environment due to the variation in different models of mobile phone which has comparatively smaller screen and buttons than computer [19].

Ruler drop method (RDM) is another simplest method to estimate the RT. Subject / athlete was asked to perform RDM by sitting with their dominant forearm resting on a flat horizontal table surface, with their open hand at the edge of the surface. The examiner / assistant was suspending the ruler vertically such that the other end of ruler was aligned with the top of the subject / athlete open hand. When the examiner / assistant releases the apparatus, the subject / athlete should catch it as quickly as possible. Then the distance travelled by the ruler is the converted into time by the formula $d = vt + \frac{1}{2}at^2$ [22].

Eckner et al validated this RDM through his observational study on evaluating a clinical measure on RT, where he evaluated the RT of 65 healthy individual with mean age 45.5 years and right hand dominants by RDM. They found excellent inter-rater (ICC= 0.92) and test-retest (ICC = 0.86) reliability also they calculated RT by using a soft ware of simple reaction time task developed using E-Prime which was installed in a personal laptop for validation of RDM. The participant were asked to sit in front of computer such that their dominant forearm should rest on the laptop keypad and they have to press space bar as the black circle on the white background on the computer screen was changed to a black randomly at the time interval of 4-15 seconds. Time interval between stimulus and pressing the button was recorded by computer in milliseconds. Feedback was given after the each trial [9].

Later Eckner et al evaluated the RT of Division I Football Players from National Collegiate Athletic Association by RDM. He selected Cog State Sport tests passed 68 athletes aged between 18-23 years. The study was aimed to compare RT by RDM (RT_{clin}) with RT by computer (RT_{comp}) with neuropsychological test battery installed. This computer monitor consist playing cards in the middle with inverted face. Athletes should press the key 'K' as quickly the card turns upward. And they conclude that there is a positive correlation between RT_{clin} and RT_{comp} (r =0.44) [20].

Fong et al was conducted a study to compare the physical fitness and RT of 20 Taekwondo practicing children aged between 10 to 14 years and the 20 children from the community with same age group. The RT of was estimated by RDM and the physical fitness was measured in terms of Sit-and-Reach Test, Leg-Split Test, One-Minute Curl-Up Test and Skin fold Measurements. The procedure of RDM was repeated for three times and the average of these was used for data analysis. They estimate RT of Taekwondo practicing children was 0.19 millisecond and RT of children from the community was 0.22 millisecond [23].

Aranha et al, evaluated the reliability and validity of RT of 12 school children aged between 6-10 years by using RDM. They used a metal ruler with one meter length with a small modification in the procedure that the metal ruler was suspended vertically such that across 5 cm was aligned with the top of the child's open hand. The distance travelled by the ruler from starting 5 cm was recorded. The trial was repeated 3 times. To estimate the validity of RDM, they used an android based mobile application known as criterion referenced Reaction speed®. They found good intra-rater reliability (ICC= 0.81) [10] and moderate to good degree of validity (ρ =0.54) [24]. But no one has established the standard reference norms for RT among the children.

Conclusion

The path-breaking work done by the narrative review will open up a new dimension of RT and its literature lacking among the children.

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Short Communication

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Father's Involvement in Upbringing a Child

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Introduction

The father has an important potential role at each developmental stage that his children pass through. Fathers play a significant role in fostering social-emotional, cognitive, language, and motor development in the lives of their young children. Research shows that the active participation of father in nurturing a child will strengthen the development of their children. A child without a father is like a house without a roof. The great *FATHER* should be faithful, attentive, a teacher, a hero, an encourager and a recreationalist.

Benefits for the children

Children with actively involved fathers are having the following benefits:

- Access to resources that facilitate healthy development (e.g., food, clothing, shelter, quality medical care).
- Children develop problem-solving skills.
- Show higher level of sociability and high level of school performance.
- More positive attitude and better behavior at school and become more independent.
- Fathers who love their children are more likely to develop strong emotional bonds with their fathers and develop healthy self-esteem.
- Fathers tend to use a more physical style of play (e.g., wrestling) that offers a number of benefits to children, including enhanced cognitive ability
- By being actively involved in a child's life, a father promotes a trusting relationship. The child does not have to worry about being abandoned.
- Fathers have a unique opportunity to teach their children valuable skills that will enable them to grow up to be healthy and productive adults.
- Positive father involvement decreases the boy's behavioral problems and better mental health for girls.
- Active fathers listen and support their children when they experience joy, sadness, anger, fear, and frustration.
- Children are less likely to engage in early sexual activity, thus reducing their chances for teen pregnancy and sexually transmitted diseases.
- Children with actively involved fathers are less likely to drop out of school, less likely to commit suicide and less likely to commit juvenile crimes than children with uninvolved fathers.
- The chances that a child will commit crimes as an adult also diminish when he grows up with an actively involved father.

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- Father provides their children with an environment in which they can become competent, productive and self directed members of society.

Benefits for the Family

- Better communication between fathers and family members
- A greater sense of commitment to the family
- Less troubling conflict with teenage children
- Fathers who are involved in nurturing a child will have happy family life that promotes optimal development of children.

Benefits for Fathers

- Enjoy a secured attachment relationship with their children
- Cope well with stressful situations and everyday hassles
- Feel more comfortable in their occupation and feel that they can do their job well
- Feel confident they have a lot to offer others in terms of their job skills, parenting skills, and social relationships.

Guidelines to be an effective father:

1. Fostering a positive relationship with the children's mother
2. Spending time with children
3. Nurturing children
4. Disciplining children appropriately
5. Serving as a guide to the outside world
6. Protecting and providing
7. Serving as a positive role model

1. Fostering a positive relationship with the children's mother

- Father should treat the mother of their children with affection, respect, and consideration.
- Children who witness affectionate, respectful, and sacrificial behavior on the part of their father are more likely to treat their own, future spouses in a similar fashion.
- Couples who can raise issues with one another constructively, compromise, and forgive one another for the wrongs done generally have happier marriages and happier children than those who do not handle conflict well or who avoid addressing issues in their relationship.

2. Spending time with children

- Fathers should spend considerable time with their children playing and having fun. Fathers' play has a unique role in the child's development, for example, how to explore the world and how to keep aggressive impulses in check.
- Fathers should maintain the active, physical, and playful style of fathering as their children age. When it comes to father-child fun, active pursuits like tossing the football, playing basketball, kicking, or going to the library are more valuable than spending time in passive activities such as watching television.
- Fathers should engage in productive activities with their children such as household chores, washing dishes after dinner, or cleaning up the backyard. Doing such shared activities promote a sense of responsibility and significance in children that is, in turn, linked to greater self-esteem, academic and occupational achievement, psychological well-being, and civic engagement later in life.
- Fathers should spend time fostering their children's intellectual growth. Fathers' involvement in educational activities from reading to their children to meeting with their child's teacher is more important for their children's academic success than their mother's involvement.
- Fathers can conduct family meeting several times a week, and encourage every member to offer ideas about how to keep the home a happy place.

3. Nurturing children

- Fathers should be responsible in infants care such as holding and hugging them often, and

participate in their basic care (e.g., feeding and changing diapers).

- Fathers should praise their children when they behave well or accomplish something, hugging and kissing their children often, and comfort them when they are sad or scared.
- Fathers should continue to praise adolescents, especially when they achieve significant accomplishments.
- Do not expect adult behavior from young children but expect them to behave as well as they can.

4. Disciplining children appropriately

- Father must maintain control of his emotions, his body language, and his hands when he disciplines his children.
- Fathers who scream at their children, who pound the table, or who strike their children are destined to fail as disciplinarians, and lose their children's respect when they are not able to control their emotions.

The keys to good discipline are

- ❖ Set clear rules and enforce them.
- ❖ Be consistent.
- ❖ Keep anger out of discipline.
- ❖ Do not confuse bad behavior with a bad child. Parents need to verbalize to children that it's the bad behavior that they don't like, not the child.
- ❖ Use time-outs and other appropriate consequences.
- ❖ Praise good behavior.
- ❖ Combine rules and limit setting with explanations. Helps them to learn what is acceptable and what is not acceptable behavior.

5. Serving as a guide to the outside world

- When the children are in preschool, fathers can prepare their children for the outside world by engaging in vigorous, physical play and encouraging small steps in the direction of autonomy.
- As children begin school, fathers can tell their children of his own experiences in school and encourage them to study hard and teach them about money management and teach them a sport that will help his children learn about teamwork.
- Fathers of adolescents should incorporate discussions of their core beliefs and life experiences into ordinary conversations with their teens and have meals with their children on a regular basis.
- Father should talk to their children about peer pressure and the dangers of alcohol, drugs, early sexual activity, and violence.
- Fathers should give controlled freedom to the adolescents.
- Fathers need to be preparing their children for the challenges and opportunities of adulthood by gradually giving them more opportunities to act independently and to make good use of their independence.

6. Protecting and providing

- Fathers are expected to provide protection for their family financially.
- Fathers play an important role in ensuring their children's safety. This is particularly important in communities that experience high rates of violence and crime.
- Fathers should pay close attention to the type of peers with whom their children are spending time. If they determine that their children's peers are engaged in unethical, dangerous, or unlawful activities, they need to minimize their children's contact with these children.
- Fathers should monitor children's health in terms of immunization, dental care and monitoring child safety.

7. Being a role model

- The better way that fathers treat other people, spend their time and money, and handle the joys and stresses of life will help in guiding the behavior of their children in better way.
- Father's relationship with opposite sex, his ability to control his own emotions, and his approach to work, all play a formative role in shaping his sons' and daughters' approach to romantic relationships, marriage, interpersonal relationships, school and work.

Conclusion

Various studies have indicated that when the fathers are in the delivery room, delivery times are shorter, anesthetic agents are used less frequently, mothers and babies are calm, and infant feeding problems are less. Father involvement makes a real difference for children in the areas of intellectual development, sex-role development, or psychological development. Most children do better when their relationship with father is close and warm, and when father lives with them. Undoubtedly fathers have important roles to play in their children's lives.

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