TNJPHMR

Letter from the

Editor's Desk

We are happy to release yet another issue of TNJPHMR. As usual it covers a wide range of subjects, ranging from anaemia, NCD control and post-Covid impact etc. with local evidence. This will enable us to refocus on the areas of challenge and impact.

Further this is one of the scientific journal which supports every cadre without any expenditure like registration fee, admin fee and processing fees etc., to promote public health science with potential to reach around an lakh employees working in the health department.

We are trying focus research on current program challenges like strengthening surveillance under IHIP and tracking of MMU RSBK program vehicles etc., wherein research output can be implemented immediately to reach benefits to the public.

It is pleasure to share that, we are in the process of presenting more than hundred scientific articles in the forthcoming Public Health Conference at Madurai on 7-9 December 2023.

Best wishes

Dr. T.S.Selvavinayagam MD., DPH., DNB.,

Director of Public Health & Preventive Medicine

CONTENTS

TNJPHMR3(2);2023

Original Article

Case Study

Why do we do basic research? To learn about

Prevalence of Malnutrition

	Under Weight	Stunting	Wasting
Red	17.65	12.06	3.82
Brown	82.35	87.94	96.18

70%(37)
23%(12)
7%(4)

Obese
Over weight
Normal
Under weight

2.6 2.65 2.7 2.75 2.8 2.85 2.9 2.95

RESEARCH IS TO SEE WHAT
EVERYBODY ELSE HAS SEEN, AND
TO THINK WHAT NOBODY ELSE HAS

ORIGINAL ARTICLE - PUBLIC HEALTH

AN OUTBREAK OF ACUTE GASTRO INTESTINAL ILLNESS IN AVARAMPATTI VILLAGE OF   DINDUGAL DISTRICT, TAMIL NADU, INDIA, 2021

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Abstract

BACKGROUND : On 29 December 2021, public health officials reported a cluster of 45 cases with loose stools and vomiting after eating food at a feast organised for a funeral at Avarampatti village of Dindugal district, Tamil Nadu, India. Our objective was to identify source of the illness.

METHODS : We did a door-to-door survey to identify additional cases and collected information on demographic, symptom details and date & time of onset of symptoms. Further, we conducted a retrospective cohort study with a cohort comprising of all people who consumed food at the funeral and collected details about type of food consumed and illness. We calculated relative risk with 95% confidence interval for all food items served. We also collected blood samples from 5 patients and stool samples from 15 patients for laboratory analysis.

RESULTS : We identified a total of 94 cases in door-to-door survey. Their mean age was 37 years (SD:17.5) and 55% (n=52) cases were males. The characteristics of epi-curve indicated a point-source outbreak. Median incubation period was 11.5 hours. Spot-map showed sporadic distribution of cases. Attack rate was higher among individuals of 15-30-year age-group (18%). A total of 269 people partook in the feast. 8 food items were ordered from a catering service and one food item spinach (commonly called "Keerai") was cooked locally and served for both lunch and dinner. Attack rate was 35% in males (n=52) and 36% in females (n=42) with (39.5%) were among 15-30 age group of people who consumed food. Of all food items served, incidence of gastrointestinal illness was higher among those who consumed Spinach (RR-3.1,95%CI:2.3-4.3). Other food items did not show association with gastrointestinal illness. Laboratory investigations did not detect presence of Salmonella, Shigella, Vibrio cholera and E. coli.

CONCLUSION : Gastro-intestinal illness might be due to Spinach (Keerai) served during the funeral feast. We recommend appropriate cooking and serving of food items, especially Spinach, to prevent such outbreaks.

KEYWORDS : Acute gastro-intestinal illness, Spinach, Food-borne outbreak

INTRODUCTION

Globally, 6-60 billion cases of gastrointestinal illness occur every year and they result in considerable morbidity, mortality and economic cost.[1,2] Between 2009 and 2018, more than 2600 food-borne disease outbreaks were reported in India with 572 deaths.[3,4] Foodborne acute gastro intestinal illnesses are investigated to prevent both ongoing transmissions of disease and similar outbreaks in the future.[5]

We received a report from public health officials of Dindugal district on 29th of December 2021. It was about a cluster of 45 cases with symptoms of acute gastro intestinal illness that occurred on 28th December 2021 at Avarampatti village of Reddiyarchatiram block, Dindugal district, Tamil Nadu, India. We mobilized a rapid response team on December 30th 2021 to the village to investigate the cluster and implement control measures.

We admitted all 45 people at Dindugal medical college and we enquired about any recent events that occurred in the village. We came to know that, on 27th of December 2021, a funeral gathering that was organized at Avarampatti village of Dindugal. A feast was served between 2pm to 8pm for those who attended funeral. We found that there were 9 food items served namely lentil gravy, spicy gravy, tamarind stew, spinach, cabbage mix, potato mix, pappad, yogurt and pickles. Soon after the funeral feast was over, many people who consumed food at the funeral started having symptoms of loose stools and vomiting.

Our objective of this outbreak investigation was to identify the source of the illness.

METHODOLOGY

We gathered details about previous acute gastrointestinal outbreaks in the Avarampatti health sub-centre area for the past three years in the month of December. We defined the case as "an acute gastrointestinal illness with complaints of

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loose stools or vomiting with onset during 25th to 30th of December 2021 among the residents of Avarampatti village". We searched for cases by active case finding by using door to door search in the village of Avarampatti among all the households. We collected basic demographic details of all the cases, their symptoms history, their time of onset of symptoms and treatment history. Based on those variables we made an epidemic curve to describe the cases based on time of onset of symptoms. We made a spot map by drawing the village map and spotting all the cases in the households. We calculated incidence by age and gender with the number of cases as the numerator and the population of the village as the denominator.

Based on the hypothesis generated from descriptive studies, we conducted a retrospective cohort study to confirm the hypothesis. Our study population had all the residents of Avarampatti village who attended the funeral. We defined the cohort as residents of Avarampatti village of any age who attended the funeral house and consumed food between 2pm to 8pm on 27.12. 2021. People who did not consume food were excluded from the cohort. We defined the exposure as consuming food (lentil gravy, spicy gravy, tamarind stew, spinach, cabbage mix, potato mix, pappad, yogurt and pickles) prepared and served at the funeral house on 27.12.2021 between 2-8pm, while the outcome was exhibiting symptoms of gastrointestinal illness. Of all the food items served at the funeral gathering, we calculated incidence and relative risk with confidence interval of food borne illness for all food items served at the funeral gathering. We collected the data by structured questionnaire by in person interview about the consumption of food items, time of food consumption and occurrence of symptoms. We conducted data analysis in EpiInfo 7.2 by calculating relative risk and 95% confidence interval.

We calculated the incubation period to determine the organism responsible for the symptoms. We calculated by incubation period by the time difference between time of onset of symptoms and time of food consumption at the funeral.

We collected blood and stool samples. Blood samples were taken from 10 cases and stool samples were taken from 5 cases. Samples were taken at Dindugal medical college and the samples were sent to the district public health lab. We tested the samples for Salmonella sp., Shigella, Vibrio and Escherichia coli. We collected the water samples from two overhead tanks in the village. Also, the tap water near the church where the funeral occurred was taken as a sample. The health inspector collected the water samples and they were also sent to the district public health lab.

The study was done with informed consent obtained from the participants and permission obtained from Ethics committee at ICMR-NIE, Chennai and Directorate of Public health and preventive medicine, Chennai, Tamil Nadu. No external funding was acquired for this study.

RESULTS

From the records at health sub-centre indicated very few acute gastrointestinal cases in the previous years in the Avarampatti village area. Additionally, through active case finding we found a total of 94 cases (incidence:8.2%) . Of those 94 case patients, 75 (80%) had vomiting, 90 (96%) had loose stools and 78 (85%) had abdominal pain. Attack rate among 9% (n=52) and females was 7.3% (n=42). Their mean age was 37 (SD:17.5). Majority of cases were among adults of age 15-30 years (incidence:17.9%), 21 cases between 30-45 years of age (incidence:8.3%). All cases were observed within a single incubation period starting from 7PM on 27th December, peaked at 9 AM of 28th December and no cases were reported after 8PM of 28th December all indicating a point source outbreak [Figure 1]. The cases were scattered throughout the village with sporadic distribution [Figure 2]. Range of the incubation period ranged from 4 to 24 hours (mean= 11.5 hours) [Figure 3]. The laboratory investigations showed no growth of organisms in the cultures. Cultures done in blood and stool sample were negative for Salmonella sp, Shigella, Vibrio and Escherichia coli. The water samples were free of E. coli, Shigella, Salmonella and Vibrio. The chlorination was found adequate in the water samples.

Of the 315 people attended the funeral. 16 people were untraceable, 16 people had incomplete entries in the food consumption profile, 14 people had incomplete symptoms profile.

269 people were taken up for study of which 150 were male. The people who consumed food had varied exposure to different food items. The incidence of acute gastro-intestinal cases in people that consumed food was 35% in male(n=52) and 36% in female (n=42) . Majority of the cases (39.5%) were among 15-30 age group people who consumed food. (Table-1)

Of the 175 people who were not sick after food consumption, majority were male (n=98) and their mean age was 38 (SD: 18.0) .55 people belonged to 15-30 age group, 49 people among 31-45 age group and 33 people among 46-60 age group.

Univariate analysis showed that occurrence of acute gastrointestinal illness was observed in people who consumed

Spinach (Keerai) at the feast [relative risk - 3.1 (confidence interval:2.34-4.36)]. All other food items had no association with acute gastrointestinal illness.(Table-2)

Further investigations revealed that Spinach was cooked and served locally at the church while all other 8 items were cooked by a catering service from outside the village.
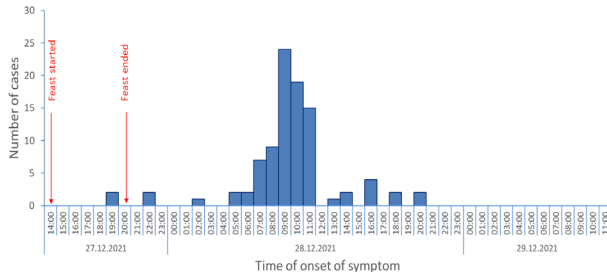

Figure 1: Epicurve showing distribution of cases by time of onset of symptoms among residents of Avarampatti village, Dindugal, Tamil Nadu, 2021
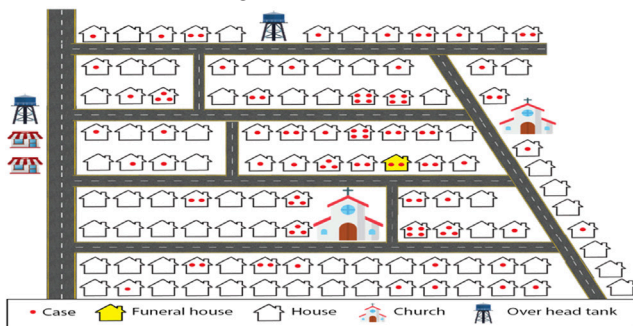
Figure 2. Distribution of cases by households among residents of Avarampatti village, Dindugal, Tamil Nadu, 2021
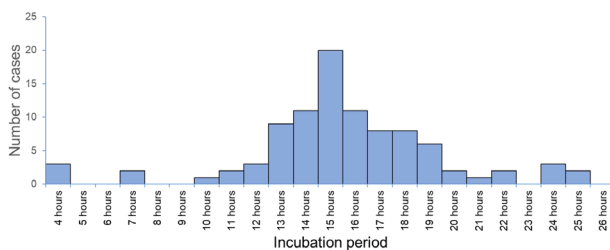
Figure 3: Distribution of cases by incubation period among residents of Avarampatti village, Dindugal, Tamil Nadu, 2021

Table 1: Attack rate by age and gender among residents of Avarampatti village who consumed food at funeral, Dindugal, Tamil Nadu, 2021

Variables		Cases (n=94)	No of people in the Cohort (n=269)	Attack rate (%)
Age Group	0-15	9	26	9.2
	15-30	36	91	39.5
	30-45	21	70	30.0
	45-60	17	50	34.0
	>60	11	32	34.3
Gender	Male	52	150	34.6
	Female	42	117	35.8
Overall		94	269	34.9

Table 2: Attack rate and relative risk of food borne disease based on consumed food items, Retrospective cohort study, Avarampatti village, Dindugal, Tamil Nadu, 2021

Food Items	No of persons those who ate specified food				No of persons those who did not eat specified food				Relative risk	95% Confidence Interval	
	Sick	Not Sick	Total	Attack rate	Sick	Not Sick	Total	Attack rate			
Lentil gravy	86	163	249	35%	8	12	20	40%	0.8	0.44	1.58
Spicy gravy	29	62	91	32%	65	113	178	37%	0.8	0.62	1.27
Tamarind stew	73	148	221	33%	21	27	48	43%	0.7	0.54	1.03
Curd	15	39	54	28%	79	136	215	37%	0.7	0.46	1.23
Potato mix	76	142	218	35%	18	33	51	35%	0.9	0.75	1.56
Cabbage mix	74	130	204	36%	20	45	65	31%	1.1	0.87	1.89
Pickle	6	33	39	15%	88	142	230	38%	0.4	0.23	0.96
Spinach	**56**	**31**	**87**	**64%**	**38**	**144**	**182**	**21%**	**3.1**	**2.36**	**4.34**
Pappad	37	83	120	31%	57	92	149	38%	0.8	0.62	1.13

DISCUSSION

Plant based toxins and some of the components of plants are found to be toxic to human body on regular consumption. An outbreak study in Purulia, India shows that the outbreak of epidemic dropsy could be due to consumption parboiled rice.[7] Similarly, several plants and their components like castor, hemlock, oleander are reported to cause acute gastrointestinal illness.[8] Even regular food items like asparagus, legumes, greens and meat products when not properly cooked or taken in excess could lead to gastrointestinal illness.[9] There are components of plant-based food items like gluten, cellulose and alkaloids that could not be processed by human body resulting in acute gastrointestinal illness.[9]

Spinach was served since it had a bitter taste as a gesture of mourning. During a funeral, it was given as a local religious practice.

Also, Spinach cannot be served for more than 8 hours after cooking, since it has a tendency of getting spoilt in a short span. But the method and time of cooking of the spinach that was served at the funeral feast could not be ascertained.

We were able to epidemiologically link the food served 'Spinach' at the funeral house as the source of the outbreak. This was the first instance in which Spinach was found to be a probable source of the outbreak in the entire locality.

LIMITATION

We could not collect the food samples because they were discarded before the start of the investigation. Also, the collected blood and stool samples did not show the growth of any organism. The samples were not tested for Bacillus sp., Clostridium sp. or other specific toxins. This lack of

laboratory confirmation served as a limitation.

There was a possibility of information bias among the participants. We narrowed it down by a closed-ended questionnaire. There were incomplete symptoms profile and incomplete profile of food consumption, both of which could lead to the underestimation of the relative risk.

CONCLUSION

Initial outbreak investigations revealed that incubation period was most likely to be 12 hours. Hence possible organism could be associated with gastrointestinal cases were E.coli, Salmonella, Shigella, Vibrio, Bacillus , clostridium and other toxins.[6]

Distribution of cases revealed point source outbreak with sporadic distribution. Majority of cases were adults and males in 15-30 age groups. All cases had history of consuming food at the feast. These descriptive findings supported the hypothesis that the outbreak could be due to consumption of food or water served during the funeral feast.

Since the water samples tested were negative for organisms and the environmental examination showed that the water source was free of pathogens, we excluded the water from the hypothesis.

From the retrospective cohort study, the results indicated that the acute gastrointestinal illness could be due to consumption of spinach.

RECOMMENDATIONS

We recommended proper cooking of food items especially spinach and serving them in closed containers before serving them to prevent such outbreaks in the future. We also recommended that food samples be collected on time by relevant authorities in case of suspicion of an outbreak, so that the microbiological agent responsible for the outbreak could be established.

FUNDING SOURCES: Nil

CONFLICT OF INTEREST: Nil

REMARKS

This study was done as a field project of the principal investigator during his MPH-FETP course in ICMR-NIE, Chennai.

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ORIGINAL ARTICLE - PUBLIC HEALTH

SPATIAL AUTOCORRELATION OF BREAST CANCER INCIDENCE AND ITS RELATION WITH HUMAN DEVELOPMENT INDEX IN TAMIL NADU: AN ECOLOGICAL STUDY

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Abstract

INTRODUCTION : Breast cancer is the most common cancer in Tamil Nadu followed by cervical cancer. Spatio-ecological patterns of breast cancer incidence provide us the frame work to understand the association of various socio-economic factors in Tamil Nadu.

AIM : To find the spatial autocorrelation of breast cancer incidence in Tamil Nadu.
To find the association between breast cancer incidence and Human developmental Index in Tamil Nadu.

METHODS : Univariate Moran's I and LISA Maps were used to find spatial autocorrelation of Breast cancer Incidence in Tamil Nadu based on the data from Tamil Nadu Cancer Registry Project. Ordinary least square method was used to find the association between Breast cancer incidence and Human Development Index, Number of government oncological institutions, private oncological institutions.

RESULTS : The univariate Moran's I for Breast cancer incidence is 0.037(p<0.05). The Breast cancer incidence occurs in specific cluster. The incidence for breast cancer positively correlated with Human Developmental Index (Coeff = 29.99, P=0.021), Number of Government oncological Institution (Coeff= -1.22, P=0.00217). The Adjusted R square is 51.1% for this Model. This model explains about the 51% variability in dependent variable (crude incidence of Breast cancer) by independent variables.

CONCLUSION : The Human Development Index is the better predictor for Breast cancer incidence in Tamil Nadu. In high HDI districts Government should focus on life style modifications like strategies to reduce obesity. In low HDI districts Government should focus on increasing new Government institutions to find a greater number of new cases. Government should focus on making policies to ensure the above factors.

KEY WORDS : Breast cancer incidence, Human Developmental Index, cancer cluster

INTRODUCTION

In India breast cancer prevalence were estimated to be 2 lakhs of total cancer burden which contribute about 14% of the total cancers. Cancer breast and cancer uteri were the most common cancer among women in India.[1] In Tamil Nadu most common cancer among women is Breast cancer (Crude incidence rate = 25.5 per lakh population) followed by cervical cancer.[2] Geographic clustering of cancer helps to identify shared exposures of individuals with cancer in small areas, which will facilitate hypothesis generation about the potential role of environmental exposures or shared behaviors by the people in local areas.[3,4]

The incidence of breast cancer increases with the Human developmental index. The reason for high breast incidence was due to westernization, life style changes, age of child birth, reproductive and hormonal factors, obesity, alcohol ,smoking and at the same time there is a better opportunity for screening facilities, more health seeking behavior, good knowledge about disease.[5,6,7,8,9] So there is a relationship between Human developmental Index and Breast cancer incidence globally. In this study we analysed the cancer clustering and the relationship between Human Developmental Index of different districts and breast cancer incidence in Tamil Nadu.

SUBJECTS AND METHODS

It is a secondary data analysis of breast cancer crude incidence based on the data from Tamil Nadu Cancer Registry Project. Tamil Nadu Cancer Registry Project is a collaborative study by the Cancer Institute (W.I.A) and Department of Medical and Family Welfare, Government of Tamil Nadu, Chennai. It covered entire Tamil Nadu population of about 80million as on 2017, the highest in the world by any cancer registry.

The Human Development Index (HDI) is an average achievement in key dimensions of human development: a long and healthy life, being knowledgeable and having a decent standard of living. The HDI is the geometric mean of normalized indices for each of the three dimensions. The HDI for all districts in Tamil Nadu was calculated by state planning commission based on the United Nation development programme.[10]

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Univariate Moran's I was used to find the spatial autocorrelation of Breast cancer crude incidence in Tamil Nadu. Ordinary least square method was used to find the association between Human Development Index, Number of government and private oncological institutions and breast cancer incidence. The Number of government and private oncological institutions list were taken from the official website of Chief Minister's Comprehensive Health Insurance Scheme.[11] The choropleth map was generated using Q GIS 3.30.2 and Moran's I and LISA maps were created using Geo Da software.

RESULTS :

The choropleth map of Tamil Nadu was used to visualize the crude incidence rate of breast cancer, Human Developmental Index, Government and Private oncological institutes in Tamil Nadu.
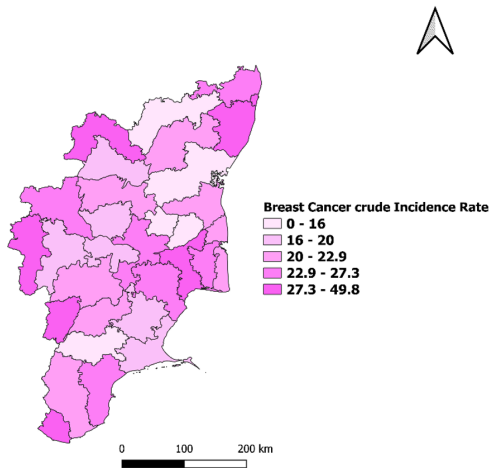
Figure 1: Breast cancer crude Incidence rate in Tamil Nadu
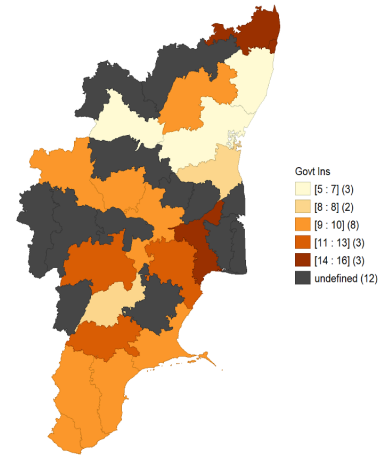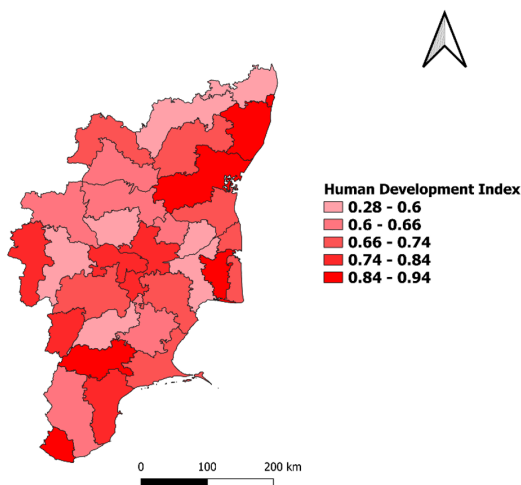
Figure 3: Government Oncological Institutions in Tamil Nadu
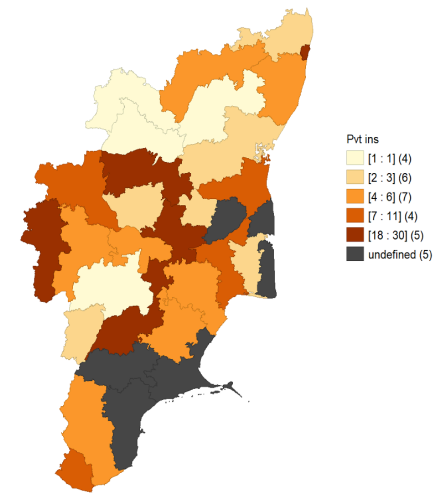
Figure 4: Private Oncological Institutions In Tamil Nadu

The univariate Moran's I for Breast cancer incidence is 0.037(p<0.05) (Fig 5). The Breast cancer incidence occurs in specific cluster. The incidence for breast cancer positively correlated with Human Developmental Index (Coeff = 29.99, P-0.021), Number of Government oncological Institution (Coeff= -1.22, P=0.00217). The R square is 60.9%,Adjusted R square is 51.1% for this Model (Table 1). This model explains about the 51% variability in dependent variable (crude incidence of breast cancer) by independent variables.
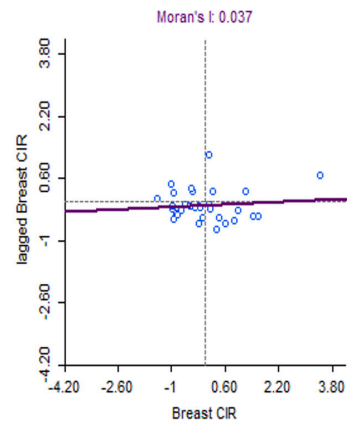
Figure 5: Moran's Scatter plot for spatial clustering of breast cancer incidence

Table 1: Ordinary least square regression

Variable	Coefficient	P-value
HDI	29.9979	0.02165
Govt Institutions	1.22459	0.02172
Private Institutions	0.35773	0.12829

DISCUSSION

The breast cancer incidence in Tamil Nadu occurs in specific clusters. The districts with high Breast cancer incidence were surrounded by other districts having high Breast cancer incidence. The Breast cancer incidence was positively associated with Human Development Index. This result suggests that districts with high cancer incidence on average have neighbours with high Human Development Index. If the HDI of district high means there is a better health service utilization, good knowledge about the disease and better standard of living. So, people in the districts with high HDI utilize breast cancer screening, early approach to the health facilities for treatment and at the same time they were predisposed to sedentary life style, obesity which are considered as the risk factors for the breast cancer. The breast cancer incidence is positively associated with the number of government institutions, this shows that the Government institutions are actively participating in finding case through proper screening.

CONCLUSION

The Human Development Index is the better predictor for Breast cancer incidence in Tamil Nadu. In high HDI districts Government should focus on life style modifications like strategies to reduce obesity. In low HDI districts Government should focus on increasing new Government institutions to find a greater number of new cases. Government should focus on making policies to ensure the above factors.

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ORIGINAL ARTICLE - PUBLIC HEALTH

AN ASSESSMENT OF COVID-19 CALL CENTER FOR THE PUBLIC BY THE GOVERNMENT IN TAMIL NADU, A SECONDARY DATA ANALYSIS STUDY.

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Abstract

INTRODUCTION : World Health Organization (WHO) declared the corona virus disease 2019 (COVID-19) a global pandemic on March 11, 2020. When such a major public health emergency arises, an effective communication between healthcare providers and the general public is a crucial component of the response. In view of this, the Tamil Nadu government initiated the call center to encounter emergency response to the COVID-19 disease outbreak.

METHODOLOGY : A secondary data analysis conducted to analyse the calls received in the COVID-19 call center during the period of November 2020 to June 2023. Official permission to conduct the study was obtained from the DPH&PM, and collected data was analysed using Openepi application.

RESULTS : Maximum calls were received during the year 2021 with morning shift (43.9%) and the majority of calls were from males (80%) between the age group of 16 to 39 years (69.2%). Covid-19 vaccine (65.6%) related calls followed by COVID-19 disease (11.8%) were the most common enquiries made. Maximum number of calls were from residents of Chennai (26.4%) followed by Coimbatore (9.8%).

CONCLUSION : The call center has served what it was meant to achieve. It has been effective in addressing the public and more manpower in needed to reduce the workload during the high call traffic hours. A dedicated call center is to be established for health-related queries during outbreaks which can help the public to prevent from exposure to disease agents and stress.

KEYWORDS : COVID-19, Call center, Health related queries, vaccines

INTRODUCTION

Wuhan, China, reported the first indication of the coronavirus disease 2019 (COVID-19) outbreak in December 2019. This disease was brought on by the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2). The deadly virus has since spread quickly around the world, leading the World Health Organization (WHO) to declare a global pandemic on March 11, 2020. The Government of India has implemented the essential measures to curb the local transmission of the virus and has set up enough diagnostic and treatment facilities in anticipation of the anticipated COVID-19 outbreak. The COVID-19 response included development and dissemination of numerous and new guidelines and directives addressing a wide range of issues such as travel restrictions, situations requiring quarantine, Covid case definition, criteria for RT-PCR testing, use of personal protective equipment, clinic management and quarantine.

When a major public health emergency arises in the modern era, effective communication between health authorities, healthcare providers, and the general public is a crucial component of the response. People call the authorities in the first instance to find a solution. To provide information to the general public and healthcare providers, the Indian government launched the Arogya Setu application. The Ministry of Health and Family Welfare (MoHFW) India included the creation of a national call centre as one of its components, offering all stakeholders a trustworthy source of information.

The Tamil Nadu government initiated the call center to provide support to the stakeholders to encounter emergency response to the COVID-19 disease outbreak. It was established under the State Emergency Operations Center (SEOC).[8] Following the establishment of the state level call center, it was established in all the cities to meet the needs of the people from the particular location. It provided wide range of services to the public and the healthcare authorities.

METHODOLOGY

STUDY DESIGN :

A secondary data analysis was conducted to assess the profile of calls received in the COVID-19 call center initiated by the Health and Family Welfare department to help the

14

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general public regarding queries related to COVID-19 and other related problems. The study included details of calls received from the period of November 2020 to June 2023.

FRAMEWORK :

The Covid 19 call center has been functioning in the SEOC. The following category of calls are being handled at the Covid 19 call center on 24*7 basis. All the employees employed were from the Directorate of Public Health and Preventive Medicine with advanced degrees and training in one of the fields of healthcare delivery system like medical officers, Epidemiologist, nurses, health inspectors, Sector health nurse, and block health supervisor. The telephone number for the call center was distributed in government announcements, in correspondence with the all the directorates of health in Tamil Nadu. In some cases, patients were advised by their providers to contact the call center rather than the official. The call center operated on all days of the week even on government holidays.

COVID-19 CALL CENTRE FUNCTIONS :

The Covid 19 Call Centre (CCC) / Health Help line SEOC was functioning in four different shift patterns.

Shift-01: 8:00 AM to 2: 00 PM - First Shift

Shift-02: 2:00 PM to 8:00 PM - Second Shift

Shift-03: 8:00 PM to 8:00 AM - Night Shift

Shift-04: 10:00 AM to 5:45 PM - General Shift

During peak hours, medical officers and health inspectors assist in answering voice calls received from the general public. They handled following types of voice calls from general public.

1. COVID-19 related doubts

2. Self-reporting of Covid Symptoms

3. COVID-19 Testing facilities

4. COVID-19 Admission facilities

5. COVID-19 Vaccine Related Calls

6. COVID-19 Vaccine Certificate Complaints

7. Complaints regarding passport issues in COVID-19 vaccine certificate

8. COVID-19 Lab Test Results

9. Complaints

10. ArogyaSetu App

11. E-Registration

12. e-Sanjeevani related call

13. Help for Treatment (Non-Covid Conditions)

DATA RECORDINGS :

A dedicated database platform was created for the call

centre to record the details of each call. The data collected were the name, age, gender, time, date and place of each caller, the question asked by the caller and the answer provided in a google form through Gmail ID.

DATA COLLECTION AND ANALYSIS :

After approval from the DPHPM data for the analysis was collected. It included call details of all the call received from the initiation of call center on March 2020 till June 2023. The data was extracted as Microsoft excel and analysed in Microsoft excel. Results are expressed as tabular columns.

RESULTS :

Table 1 shows the call timings and the number of calls received during the call hours. Most of the calls were received during 8:00 am to 2:00 pm followed by 2:00 pm to 8:00 pm.

Table 1 : Duty timings

Shift Timings	Frequency	Percent
8:00 AM to 2:00 PM	1,22,273	43.9
10:00 AM to 5:45 PM	7,823	2.8
2:00 PM to 8:00 PM	1,14,769	41.2
8:00 PM to 8:00 AM	33,800	12.1
Total	**278665**	**100**

Table 2 : Frequency of calls during the years.

Call Received Year wise	No. of Calls	Percent
From 14th November, 2020	7,964	2.86%
2021	2,17,905	78.20%
2022	52,461	18.83%
2023 Upto 6th March 2023	335	0.12%
Total	**278665**	**100**

Figure 1 shows the distribution of gender among the callers. Males were the predominant callers. Table 2 shows the age grouping of those who called the call center. Majority of the calls were from those with in the age group of 16 to 39 years.
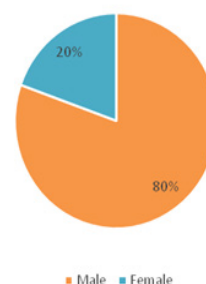

Gender (n=278665)

■ Male ■ Female

Figure 1: Gender distribution of the callers

Table 3 : Age distribution of the callers

Age	Frequency	Percent
0-15 years	1,124	0.4
16-39 years	1,92,834	69.2
40-59 years	77,211	27.7
Above 60 years	7,496	2.7
Total	**278665**	**100**

Table 3 shows the category of call received in the call center. Covid vaccine related calls were the queries for which the call center was used most frequently followed by covid vaccine certificates. It also had international calls from those who wanted to return back to India regarding the guidelines for international travellers. Details other than covid 19 was also among the call received.

Table 4 : Category of call received

Call Category	Frequency	Percent
Covid-Vaccine Related Calls	102163	36.7
Covid-Vaccine Certificate Complaints	83301	29.9
Covid -Related Doubts	32758	11.8
Covid -Lab Test Results	14347	5.1
Complaints related to Covid-19	14276	5.1
Covid -Testing Facilities	12076	4.3
Covid -Admission Facilities	7201	2.6
E-Registration for travel within the District	5414	1.9
Self- reporting of Covid -symptoms	2237	0.8
Complaints regarding passport issues in COVID Vaccine certificate	1383	0.5
E-Pass	1271	0.5
Arogya Setu App	1095	0.4
Covishield vaccine Volunteer call for Sero Survey	466	0.2
Help for Treatment (Non-Covid Conditions)	386	0.1
complaints regarding flood due to rain	214	0.1
eSanjeevani related call	50	0
UK / London returnees Call	19	0
Others	6	0
Complaints regarding water born related illness	2	0
Total	**278665**	**100**

Table 4 shows the details of the action taken or response given to the call. Sharing of information regarding the vaccine was the most common action taken to the calls followed by sharing details of district EOC for local guidance.

Table 5 shows the details of the location from where the calls were made from. Majority of the calls were from Chennai. The call list also contained calls from other state and from other countries.

Table 5 : Type of action taken to the calls received

Action Taken to the Call	Frequency	Percent
Vaccine related information given	102046	36.6
District EOC Helpline contact details given	99544	35.7
Doubts answered	32782	11.8
Complaint related information given	14170	5.1
Testing facilities details given	12102	4.3
E registration related information given	7246	1.9
Admission facilities details given	7169	2.6
Advised & Nearby health facility details given	2452	0.9
E pass related information given	1266	0.5
Counselling Helpline numbers given	584	0.2
App related details given	539	0.2
Volunteer details collected	464	0.2
Non-covid conditions related details given	118	0
eSanjeevani login details given	48	0
Doubts cleared & Local Helpline numbers given	16	0
Others	6	0
Covid -Testing Facilities	1	0
Dialysis Help related details given	1	0
Total	**278665**	**100**

Table 6 : District wise distribution of calls.

Sl No	Name of the District	Frequency	Percentage	Sl. No	Name of the District	Frequency	Percentage
1	Ariyalur	1397	0.5	21	Ramanathapuram	2219	0.8
2	Chengalpattu	12143	4.4	22	Ranipet	2512	0.9
3	Chennai	73431	26.4	23	Salem	7931	2.8
4	Coimbatore	27274	9.8	24	Sivagangai	2706	1
5	Cuddalore	6856	2.5	25	Tenkasi	1819	0.7
6	Dharmapuri	3119	1.1	26	Thanjavur	6402	2.3
7	Dindigul	3376	1.3	27	Theni	3011	1.1
8	Erode	7784	2.8	28	Thiruchirapalli	8457	3
9	Kallakurichi	1795	0.6	29	Thiruvarur	2746	1
10	Kancheepuram	8036	2.9	30	Thoothukudi	2208	0.8
11	Kanyakumari	4508	1.6	31	Tirunelveli	3082	1.1
12	Karur	2967	1.1	32	Tirupattur	1529	0.5
13	Krishnagiri	5322	1.9	33	Tiruppur	7288	2.6
14	Madurai	8180	2.9	34	Tiruvallur	9974	3.6
15	Mayiladuthurai	1628	0.6	35	Tiruvannamalai	3755	1.3
16	Nagapattinam	1743	0.6	36	Vellore	4595	1.6
17	Namakkal	4422	1.6	37	Villupuram	3371	1.2
18	Nilgiris	2041	0.7	38	Virudhunagar	3762	1.4
19	Perambalur	1567	0.6	39	Other State	19358	6.9
20	Pudukkottai	3191	1.1	40	International Call	961	0.3

Table 6 shows the details of maximum calls were received from Chennai District (73431) followed by Coimbatore District (27274) and least calls received from Ariyalur District (1397).

DISCUSSION

The State Emergency operation Centre caller's Help Desk was initiated by the Health and Family Welfare Department, Government of Tamil Nadu at Directorate of the Public Health and Preventive Medicine to compact the Covid pandemic. It has been successfully functioning for

serving the general public. It has been managed effectively by providing adequate training and retraining of those who were posted in the EOC to handle calls and provide guidance to the public. The dedicated healthcare personals made the functioning of it more effective.

Maximum calls were received during the morning shift followed by afternoon shift indicating the high traffic of calls during the standard working hours. This was the time when maximum healthcare workers were posted in the EOC to manage the heavy traffic of calls. Moreover, the public are more health seeking during day times rather than at nights which could be due to lack of awareness in the working time of EOC.

Males were those who reached the call center frequently rather than the females which could be due to the role of head of family lead by males in most families. Middle aged population between the ages 16-39 years were those who used the call centers which could be due to the responsibility and the burden on the middle-aged population to look after the elderly and paediatric population. It also could reflect the awareness on the latest information technologies available in healthcare among the young adults who explore media more frequently than the elderly. Most of the migrant worker in Tamil Nadu are males and the migrant workers who were strongly affected in the lockdown period called for food, groceries, basic needs and health care related queries.

Post introduction of COVID-19 vaccination maximum queries to the call center were regarding vaccine. This was further classified as vaccine related calls such as places of vaccination and availability of vaccines, followed by queries regarding vaccines certificates. Vaccination and certificates of vaccination played a major role in controlling the spread of disease and helped the public to avail resources. COVID-19 related doubts were the most common calls at the initiation of the call center which was during the pandemic.

Call center guided the public in accessing details regarding the testing labs, lab reports of COVID-19, facilities for receiving the care and for applying the travel pass which was difficult to access during the lockdown. Without the call centers many rural communities and marginalised communities would have had a hard time in accessing the health care and general COVID-19 related information. It also provided support to public travelling from other states and nations regarding the guidelines for travellers to reach their family at times of needs,

The actions taken following the calls have been satisfactory from the beneficiaries. Vaccine related queries were given information regarding the purpose of call. Several of the

callers from various districts were guided to their appropriate district EOC for details pertaining to that particular district which varied within the state. Complaints were sorted appropriately and settled on time to relieve the beneficiaries from theirhardships. Non-covid queries were also settled with proper directions and guidance.

Majority of the calls to the call center were from Chennai district followed by Coimbatore and Chengalpattu within Tamil Nadu. When considered all the calls queries from other states were the second highest callers to the call center. Travel was a major problem and crossing interstate boundaries was also a problem for many which was guided through the call center. During the covid19 pandemics the cities that were affected most were those who accessed the call center. Chennai had the maximum number of Covid cases in the entire state and the SEOC call center being available in Chennai was easily accessible by the public in and around it. The least affected cities were those who made the least calls. The call center received reasonable amounts of international call. This indicates the spread of information to those who were in countries other than India.

The call centre in addition to providing the support during the COVID-19 pandemic it all catered other services like helping the 104 health helpline when there was high traffic in calls regarding COVID-19 related queries like the availability of 108 ambulance service and bed for the patients, triaging and covid care center details for those who turned positive for COVID-19. It also guided the health care providers to track the beneficiaries of the Non-communicable disease program in receiving medications and follow-up of cancer patients when they failed to follow up on time.

CONCLUSION

Our study is the first of its kind in Tamil Nadu to assess the healthcare services offered through call centers to the public during the COVID-19 pandemic. The volume and timing of calls received by the call center support our assumption that it served a temporary essential function, facilitating rapid information transfer to the community. Every district and every state should have a dedicated call center to address the problems of the public. In addition to the regular call centers there should be additional dedicated call centers to the public at times of epidemics and emergencies similar to the hotlines available for disaster by national disaster management authorities. There should be provision of calculation of time taken to collect information from the public and the time taken to address the problem to assess the efficiency of the information providers.

This call center should be incorporated with the Disaster Management Authorities at times of natural calamities to provide more support to the public in reducing their sufferings. More dissemination of information regarding the call centers functioning, working hours and periods and the information shared through it should to done to improve the access by all the people from highly developed cities to poorly developed villages. The challenges of reaching the marginalised communities can be easily accessed by these centers with development and usage of telecommunication in the modern era.

CONFLICT OF INTEREST
Nil.

FINANCIAL ASSISTANCE
Nil.

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ORIGINAL ARTICLE - PUBLIC HEALTH

AN EVALUATION OF THE PROGRESS OF THE INTEGRATED DISEASE SURVEILLANCE PROGRAMME THROUGH INTEGRATED HEALTH INFORMATION PLATFORM IN TAMIL NADU FROM 2021 TO 2023.

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Abstract

INTRODUCTION : The surveillance system is the armour of public health and preventive medicine. In India surveillance is monitored in real-time through the Integrated Health Information Platforms Integrated Disease Surveillance Programme(IHIP-IDSP). Effective implementation and surveillance depend on the efficiency of the healthcare providers at all levels from peripheral reporting units to the State surveillance units(SSU). The aim of the study was to evaluate the performance of the Surveillance units of Tamil Nadu in IHIP-IDSP.

METHODOLOGY : This cross-sectional study was carried out using the data extracted from the IHIP-IDSP platform from 2021 to 2023 after obtaining official permission from the Director of Public Health and Preventive Medicine, Tamil Nadu. Data was analyzed using SPSS version 21. Results are expressed as frequency and proportion for categorical variables and mean and standard deviation for continuous variables.

RESULTS : There has been a rapid improvement in reporting in the IHIP-IDSP with the number of units reporting, consistency, and quality of the reporting units. The number of units reporting increased from less than 10% at initiation to more than 90% in 2023. Improvement in flagging of events and urban mapping is to be improved. There has been a rapid improvement in the consistency of reporting, and the quality of reporting is improving at a steady phase.

CONCLUSION : The overall performance of the state has been improved but it lacks quality in certain fields. It has to be improved with proper sensitization measured with training and retraining sessions with pre and post-training assessment and mock drills to improve hands-on skills.

KEYWORDS : Integrated Health Information Platform, Integrated Disease Surveillance Programme, Surveillance, Outbreak

INTRODUCTION

India is a developing country with a triple burden of diseases which includes communicable diseases, non-communicable diseases, and nutritional disorders. Several initiatives have been established to fight this triple burden.[1] Non-communicable disease and nutritional disorders are chronic conditions which has a long window period, whereas communicable diseases are major public health problem that has the potential to cause disharmony in the public. They have the potential to spread from one individual to another leading to epidemics or outbreaks of diseases. The recent pandemic of COVID-19 is an example that could have been controlled if the initial cases were identified timely, isolated, and adequate surveillance was initiated.[2,3]

To strengthen the communicable disease surveillance in India, the Ministry of Health, and Family Welfare (MoHFW) launched the Integrated Disease Surveillance Programme (IDSP) in November 2004 with the assistance from World Bank till 2012.[4] The key elements of IDSP are the major five activities which are i) collection of data, ii) compilation of data, iii) analysis and interpretation of data, iv) follow-up action, and v) feedback. Reporting in IDSP was earlier weekly reporting of data collected in the field, institutions,

and laboratories using the 'S' syndromic; 'P' probable; & 'L' laboratory formats using standard case definitions. The data was collected as aggregate numbers rather than as line list. Further, the weekly data was analyzed by the State Surveillance Unit (SSU) or District Surveillance Unit (DSU) to assess the disease trends. In case of a rising trend of illness, it was investigated by the Rapid Response Team (RRT) to perform an outbreak investigation and control the outbreak if any existed. It was later merged with the National Health Mission as a program.[5,6]

In April 2021 IDSP was brought under the next generation highly refined version which is an overarching platform Integrated Health Information Platform (IHIP) as IHIP-IDSP with several updates. It is in sync with the National Digital Health Mission (NDHM).[7] It is a decentralized state-based surveillance system that focuses on major epidemic-prone

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diseases. The IHIP-IDSP helps to identify the early warning signals of impending outbreaks of the reported diseases so that timely and effective responses can be initiated to combat the challenges regarding health in the country at the block level, district level, state level and national level effectively and timely manner.[8,9] However in spite of IHIP-IDSP being functional for almost three years, there has been only few studies on the performance in reporting S/ P/ L form but the performance as a whole is still lacking.

Tamil Nadu ranks second in the health index based on NITI AAYOG report. Tamil Nadu being one of the developed states in India has performed well in terms of healthcare. It has been on the list of top few states to achieve all the goals set by the MoHFW towards the well-being of the community. But only a countable number of studies has been conducted on the performance of individual form or the entire performances in IDSP before the initiation of IHIP-IDSP and hardly any after 2021 for the total performance. Hence this study has been conducted to evaluate the performance of Tamil Nadu in IHIP-IDSP and to focus on the fields where action has to be taken to improve the performance.

METHODOLOGY

STUDY AREA: Tamil Nadu is the tenth largest state in India and covers a population of 7.21 crores according to census 2011 and estimated to be around 8.21 crores as of 2023.[10] It is organized administratively into 38 districts with 12 major corporations. All the districts have designated District Surveillance Units (DSU) headed by the District Surveillance Officer (DSO) and they are monitored by a State Surveillance Unit (SSU) headed by the State Surveillance Officer (SSO). All the 38 DSUs were included in the study at the state level.[11]

STUDY DESIGN AND DATA COLLECTION: This retrospective cross-sectional study was carried out in the state of Tamil Nadu using the data extracted from the IHIP-IDSP platform from its initiation in April 2021 till October 2023. The data contained the performance of all the DSU in the field of performance of daily reporting of S form, P form, L form, and the outbreak in terms of health events response and outbreak investigation and response. The collected data was entered in Microsoft Excel and analysed using IBM-SPSS Version 21. The results were expressed in frequencies, and proportions for categorical variables and interpreted accordingly with appropriate charts and figures. Continuous variables were expressed as mean and standard deviation and expressed as tabulations. Prior permission to carry out the study was obtained from The Directorate of Public Health and Preventive Medicine (DPH & PM) and the SSU.

PERFORMANCE ASSESSMENT: The performance of each District/ State can be monitored in the performance dashboard of the IHIP-IDSP platform. Figure 1 shows how performance is calculated based on (i) Reporting performance, (ii) Urban area mapping (wards to subcenters), and (iii) Outbreak response. They are further classified as S-form reporting, P-form reporting, L-form reporting, Cases reporting, Urban mapping and Outbreak response. The scoring is done on a daily basis and for a selected period the mean score of that period is shown. Each report is given a weightage for performance and a ranking is issued based on the reporting.[11,12]
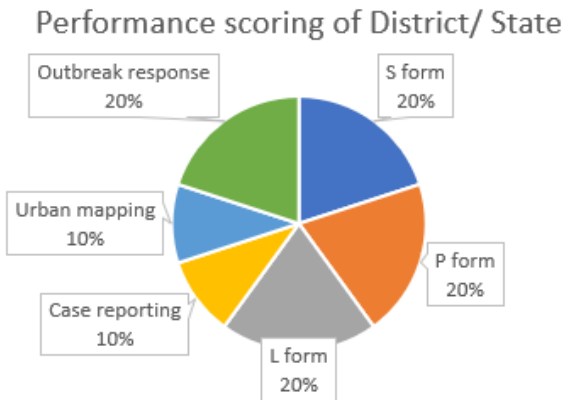
Figure 1: Variables used to assess the performance scoring in IHIP-IDSP.

Performance scoring and weightage for S/ P/ L form is showed in Figure 2. For S/ P/ L forms daily reporting of each unit is given a score based on a specific weightage and the DSU scoring is calculated from the average of all the reporting units (RU) under them. The above scoring of all the DSUs is considered for the scoring and ranking of the SSU/ State which is the average of all the DSUs. When no cases are detected in the field or institution, or the laboratory nil case reporting is mandatory for receiving a score of 20 points. If the case entry or nil case entry is not done on a particular day the scoring for that RU will be lost which will reflect in the performance of the DSUs and SSUs.[11,12]

Case reporting is assessed by the reporting of cases in the IHIP-IDSP platform. It is scored based on the performance of the RUs. It reflects the quality of reporting of the RUs and the effective monitoring of the RUs by the DSUs and SSUs. Even the entry of a single case detected in the field in the S-form or a case identified in the institution for the P-form or a Laboratory confirmed case in the L-form will provide a full score for the reporting of cases.[11,12]

Urban mapping is scored based in the percentage of urban wards mapped with the sub-center. Maximum scoring is provided to all the DSUs when they have completely mapped all the reporting units. It involves mapping the sub-center

with the corresponding village of the panchayat in the block with the corresponding district in the particular state. When the mapping is completed the DSUs will be provided points which has an impact of the SSU.[11,12]
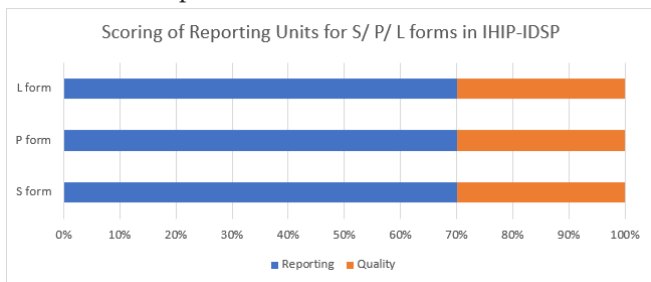
Figure 2: Scoring for reporting units based on reporting S/ P/ L forms in IHIP-IDSP.

Outbreak response of the performance has two components which are shown in Figure 3 with further classifications in scoring. They are the event alert response time and the outbreak completion time. Scoring is given when the response was within the time frame provided with the required details of the event of outbreak.

An event can be flagged by anyone with a reporting login credentials. It can be a healthcare worker (HCW) from the government, a private practitioner, any RU, DSU, SSU, CSU or Media team. Performance scoring for the event alert is analysed based on the investigation by the DSU's investigation team/ Rapid Response Team (RRU) and either converting the event into an outbreak or by closing the event with proper reporting that there is no outbreak potential. The entire event investigation has a window period of 48 hours to be completed to receive the maximum scoring.[11,12]

An outbreak is initiated when an event with outbreak potential is approved by the DSO to be converted as an outbreak. The outbreak is considered completed when no cases have been reported for two incubation periods of the particular disease since the last identified case. Activities scoring in outbreak completion involves deployment of RRT, composition of the RRT, updating details of the outbreak by the RRT members, line listing of cases identified during the investigation, investigations sent to labs, updating results of investigations, feedback and updates by the DSO and sending the outbreak investigation completion with appropriate documents.

Scoring for outbreak performance involves certain criteria. They include,

(i) Events responded- Percentage of events responded out of the events reported during the selected period of time.

(ii) Response time- Percentage of reported events which closed/converted within 2 days of reporting, out of event reported during the selected period.

(iii) RRT deployment- Percentage of new outbreaks where the date of RRT deployment is within 2 days from the outbreak creation date, out of outbreak created during the selected period.

(iv) RRT composition- Percentage of new outbreaks where at least one RRT member is District / State RRT, out of outbreaks created during the selected period.

(v) RRT updates- Percentage of Outbreaks where at least one RRT update was submitted, out of outbreak created during the selected period.

(vi) Line listing of cases- Percentage of Outbreaks where at least one case/death reported line listed, out of outbreak created during the selected period.

(vii) Sample collection- Percentage of Outbreaks with at least one human sample collected, out of outbreak created during the selected period.

(viii) Updating of results- Percentage of Outbreaks with at least one human sample result updated, out of the outbreaks created during the selected period.

(ix) DSO updates- Percentage of Outbreaks where at least one D$O update is available, out of the outbreak created during the selected period and

(x) Outbreak completion- Percentage of outbreaks completed, out of the outbreak created during selected period.[11,12]
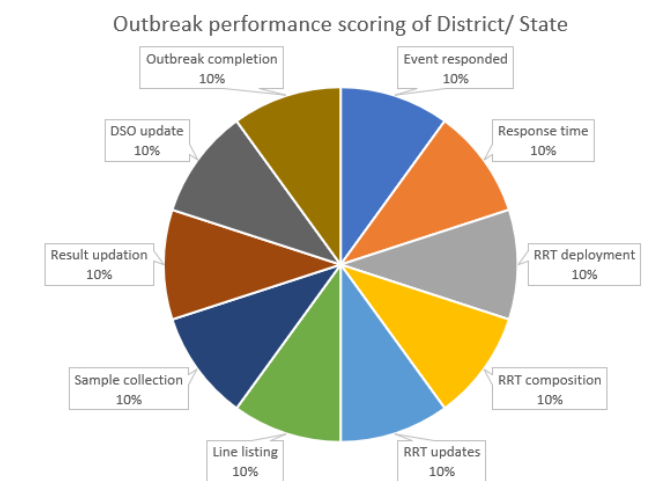
Figure 3: Scoring system for Outbreak performance in IHIP-IDSP.

RESULTS

The performance in IHIP-IDSP is obtained from the IHIP. The mean performance score of States in India from January to October 2023 in IHIP-IDSP is shown in Figure 4. The mean performance score of India in IHIP-IDSP is 70.24. Tamil Nadu has a performance score of 80.25 for the above period which is higher than the National mean and ranks 9th overall behind States like Odisha, Telangana, Bihar, Gujarat,

Karnataka, Tripura, and Union Territories like Daman & Diu, and Puducherry. Overall best performance is observed in Daman & Diu with 93.44 in Union Territories and Odisha with 91.99 in the States.

The total RUs for S-form, P-form and L-form as of October 2023 in Tamil Nadu is 10868, 5732 and 48056 units. The performance of these units has been increasing over the years since the inception of IHIP-IDSP. S-form reporting in IHIP-IDSP was initiated in April 2021 with 431 units reporting initially which improved to 1813 in January 2022 and 8734 units in January 2023. During the year 2023 there was a gradual increase in reporting to 10001 units in September 2023 which fell a few RUs in October 2023 to 9936 units. Similarly, P-form has 5732 RUs which was initiated in 2021 with 392 units reporting at the initiation. The performance improved rapidly to 3625 and 4907 in January 2022 and 2023. The maximum reporting of P form was in the month of September 2023 which has a slight fall in reporting by October to 5514 units. Similar to S-form and P-form, L form RUs as of October 2023 in Tamil Nadu is 4805 units among which 399 units started reporting 2021 when initiated. This reporting improved in significant number to 2912 and 3986 in 2022 and 2023. The maximum reporting of L form was observer during the month of September 2023 with 4628 units reporting and by the end of October 4562

units were reporting in L form. The progress over the years of reporting in the IHIP-IDSP platform is shown in Figure 4.

Table 1 shows the performance of Tamil Nadu in the IHIP-IDSP platform from its initiation in 2021 with a mean score of 37.74 ± 3.95 to October 2023 with a mean score of 78.77 ± 9.34. The performance over the years has been increased during the past three years in all the fields such as S-form 1.83 ± 2.41 to 16.89 ± 3.31 , P-form 7.21 ± 1.87 to 17.48 ± 1.46 , L-form 8.27 ± 2.17 to 17.84 ± 1.52, case reporting 2.25 ± 0.92 to 6.08 ± 2.14 and outbreak response 8.77 ± 3.96 to 12.07 ± 3.91. The urban mapping 8.40 ± 2.52 has been stagnant for all these years.

Table 2 shows the 2023 performance of all the districts in Tamil Nadu in completion of S-form, P-form and L-form. The scoring of these forms' performance is based on the consistency and quality which has been expressed as mean and standard deviation. S form performance ranged from 0.00 in Chennai to 99.99(± 0.24) in Dharmapuri, P form performance ranged from 55.23(± 29.23) in chennai to 91.63(± 12.11) in Dharmapuri and L form performance ranged from 46.62(± 28.23) in Chennai to 92.5(± 11.01) in Cu

Table 3 shows the improvement in the performance of the state of Tamil Nadu in reporting S-forms, P-forms and L-forms over the period of years. The performance improved

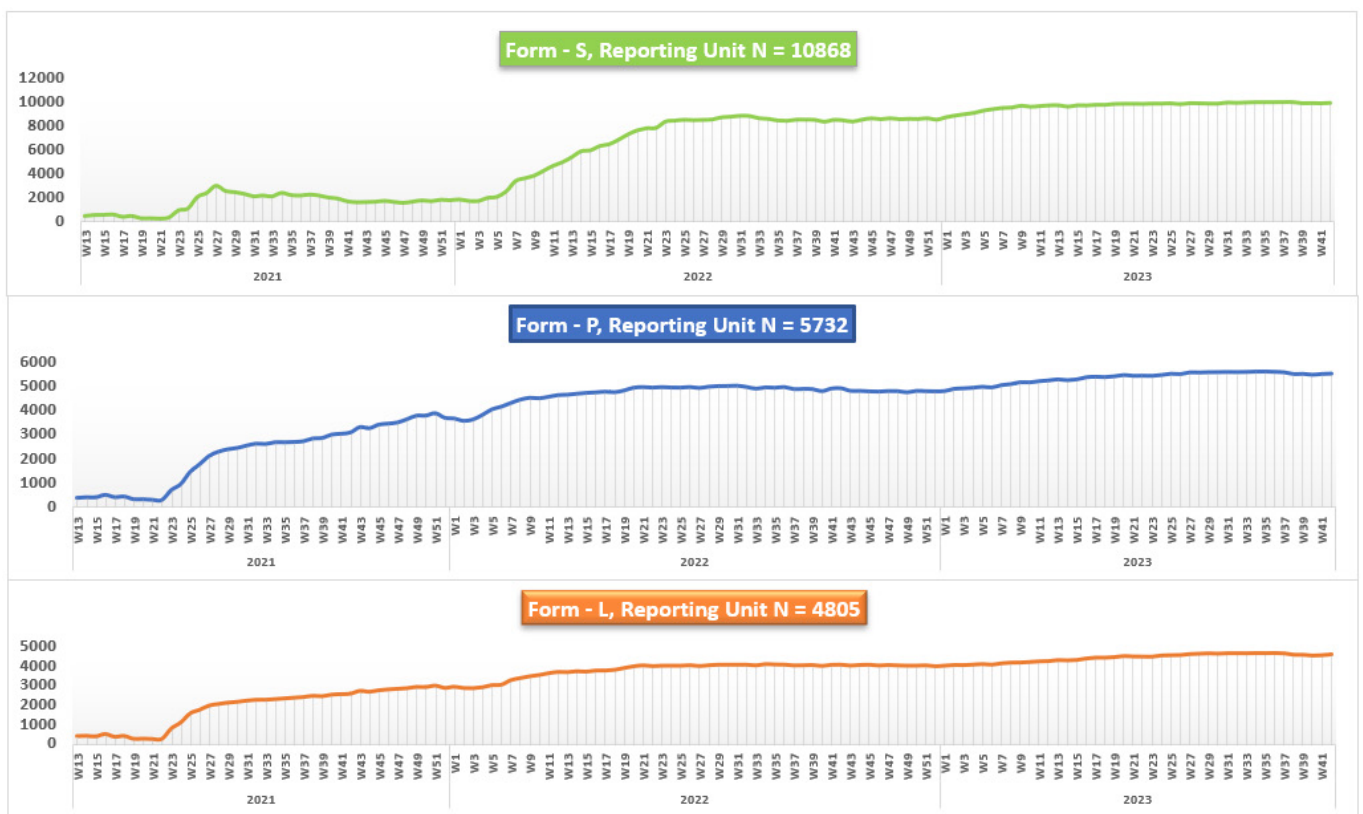*Figure: 4, Line diagram showing the daily reporting trend of S-form, P-form and L-form in Tamil Nadu from April 2021 to October 2023.*

Table 1: IHIP-IDSP performance.

Factors	2021 to October 2023 Mean (SD)	2021 Mean (SD)	2022 Mean (SD)	October 2023 Mean (SD)
Total Score (100)	62.5258 (9.09)	36.7368 (8.95)	67.2889 (12.36)	78.7739 (9.34)
S-Form Score (20)	10.305 (2.81)	1.8347 (2.41)	11.2153 (15.40)	16.8982 (3.31)
P-Form Score (20)	13.6768 (1.76)	7.2082 (1.87)	15.3953 (2.61)	17.4797 (1.46)
L-Form Score (20)	14.3192 (1.90)	8.2742 (2.17)	15.9537 (2.56)	17.8392 (1.52)
Case Reporting (10)	4.5695 (1.57)	2.2463 (0.92)	5.0692 (1.91)	6.0803 (2.14)
Urban Mapping (10)	8.4047 (2.52)	8.4047 (2.52)	8.4047 (2.52)	8.4047 (2.52)
Outbreak Response (20)	11.2505 (2.96)	8.7687 (3.96)	11.2508 (3.75)	12.0718 (3.91)

Table 2: Tamil Nadu District wise performance in S-form, P-form, and L-form.

District name	S-form District-wise performance 2023 Mean (SD)			P-form District-wise performance 2023 Mean (SD)			L-form District-wise performance 2023 Mean (SD)		
	Consistency Score	Quality Score	Total Score	Consistency Score	Quality Score	Total Score	Consistency Score	Quality Score	Total Score
Ariyalur	68.5 (1.30)	24.9 (10.03)	93.4 (10.35)	67.35 (8.65)	22.6 (9.85)	89.95 (15.84)	67.37 (9.33)	20.44 (11.93)	87.81 (17.66)
Chengalpattu	55.15 (12.78)	9.49 (10.05)	64.64 (20.25)	50.03 (18.91)	16.31 (12.40)	66.34 (30.55)	47.4 (21.12)	14.42 (13.34)	61.82 (33.52)
Chennai	0	0	0	45.55 (21.20)	9.69 (10.30)	55.23 (29.23)	39.7 (22.1)	6.91 (9.34)	46.62 (28.23)
Coimbatore	54.34 (11.02)	2.58 (3.94)	56.92 (11.06)	59.27 (8.87)	10.38 (10.44)	69.65 (17.17)	55.54 (12.84)	4.96 (8.51)	60.5 (17.39)
Cuddalore	61.48 (6.06)	2.51 (5.51)	63.99 (6.69)	65.36 (5.18)	23.9 (7.34)	89.26 (11.26)	67.89 (3.49)	24.61 (8.54)	92.5 (11.01)
Dharmapuri	69.93 (0.17)	29.97 (0.07)	99.9 (0.24)	69.98 (0.11)	21.66 (12.09)	91.63 (12.11)	69.99 (0.05)	20.16 (13.19)	90.15 (13.19)
Dindigul	62.01 (8.41)	3.87 (8.48)	65.88 (12.25)	59.34 (12.24)	18.31 (11.08)	77.65 (20.80)	59.22 (13.25)	17.23 (12.08)	76.46 (22.54)
Erode	61.33 (9.31)	25.49 (5.89)	86.81 (14.03)	63.45 (5.71)	13.8 (11.71)	77.25 (16.15)	64.83 (5.93)	14.84 (11.98)	79.68 (16.32)
Kallakurichi	69.42 (0.79)	25.78 (5.02)	95.21 (5.15)	66.6 (4.56)	23.98 (9.17)	90.58 (12.07)	67.81 (3.61)	22.31 (11.36)	90.12 (13.89)
Kanchipuram	61.38 (7.16)	8.98 (9.14)	70.37 (11.27)	55.06 (12.96)	18.07 (9.18)	73.13 (21.44)	57.64 (15.24)	18.1 (10.78)	75.73 (24.81)
Kanniyakumari	67.15 (3.06)	25.23 (8.57)	92.38 (9.11)	60.46 (9.19)	13.19 (10.98)	73.65 (17.70)	63.68 (8.87)	16.72 (11.11)	80.4 (17.95)
Karur	64.03 (4.56)	25.65 (4.93)	89.68 (7.90)	62.54 (9.63)	19.93 (11.06)	82.47 (18.21)	67.01 (3.28)	23.17 (10.71)	90.19 (12.85)
Krishnagiri	62.51 (7.69)	26.5 (3.5)	89.01 (11.06)	57.14 (15.93)	22.06 (9.05)	79.2 (23.84)	57.31 (17.63)	20.07 (11.35)	77.39 (27.29)
Madurai	62.32 (8.74)	1.17(4.62)	63.49 (9.82)	62.53 (8.70)	16.36 (12.49)	78.89 (18.79)	62.58 (10.13)	13.61 (12.07)	76.19 (19.90)
Mayiladuthurai	65.84 (8.09)	28.12 (3.56)	93.96 (11.59)	62.4 (15.49)	24.97 (8.37)	87.38 (23.09)	63.36 (16.53)	25.92 (9.26)	89.28 (25.20)
Nagapattinam	63.04 (8.14)	26.87 (3.67)	89.91 (11.63)	60.93 (9.29)	22.71 (9.40)	83.63 (16.72)	62.16 (10.22)	21.74 (10.72)	83.9 (19.41)
Namakkal	62.74 (6.73)	26.14 (3.53)	88.88 (9.79)	50.66 (20.48)	18.58 (11.01)	69.24 (30.81)	51.87 (22.78)	16.42 (13.17)	68.29 (34.25)
Perambalur	58.16 (3.6)	24.93 (1.54)	83.09 (5.14)	57.15 10.62)	18 (11.56)	75.15 (18.51)	61.48 (6.53)	17.39 (12.11)	78.87 (16.89)
Pudukkottai	66.24 (3.6)	15.91 (11.24)	82.15 (12.44)	63.55 (7.35)	21.61 (11.01)	85.16 (16.44)	65.67 (7.58)	24.46 (9.89)	90.14 (16.10)
Ramanathapuram	48.39 (10.70)	10.3 (10.69)	58.69 (18.53)	60.99 (6.81)	18.36 (11.04)	79.35 (16.70)	63.58 (6.69)	20.31 (10.14)	83.89 (15.97)
Ranipet	56.64 (8.22)	23.04 (4.81)	79.68 (12.29)	52.18 (15.18)	20.66 (7.91)	72.84 (22.66)	57.29 (17.60)	22.92 (8.81)	80.21 (26.03)
Salem	64.13 (8.7)	26.24 (6.02)	90.37 (13.02)	58.08 (15.11)	20.17 (11.28)	78.25 (24.62)	61.19 (12.46)	20.24 (11.65)	81.43 (22.06)
Sivaganga	59.22 (11.25)	24.46 (6.14)	83.68 (16.11)	55.2 (13.91)	19.84 (9.93)	75.04 (22.65)	51.98 (15.17)	16.38 (10.91)	68.36 (23.88)
Tenkasi	68.26 (2.16)	28.11 (2.18)	96.38 (3.93)	58.86 (15.07)	18.88 (11.04)	77.73 (23.97)	59.06 (17.42)	17.95 (10.54)	77.01 (26.16)
Thanjavur	64.84 (1.11)	27.09 (2.50)	91.92 (3.03)	67.39 (9.50)	17.56 (11.89)	84.96 (17.38)	66.98 (11.19)	18.93 (12.15)	85.91 (19.03)
The nilgiris	66.01 (3.35)	1.39 (3.43)	67.4 (4.79)	60.24 (10.35)	21.35 (9.38)	81.58 (17.51)	62.09 (10.30)	18.74 (12.16)	80.84 (19.73)
Theni	62.06 (7.18)	1.93 (5.19)	64 (9.29)	55.41 (14.53)	15.57 (11.69)	70.98 (23.26)	61.35 (14.30)	18.13 (11.81)	79.48 (23.18)
Thiruvallur	57.12 (16.22)	18.73 (11.33)	75.85 (24.47)	55.79 (14.95)	20.77 (9.00)	76.56 (22.64)	58.66 (16.60)	20.28 (10.70)	78.94 (25.56)
Thiruvarur	53.16 (9.79)	1.21 (3.57)	54.37 (10.17)	44.78 (19.95)	16.46 (10.61)	61.24 (29.79)	51.06 (22.17)	18.39 (12.19)	69.45 (33.18)
Tiruchirappalli	45.36 (15.36)	6.19 (7.00)	51.55 (17.78)	51.21 (14.60)	15.62 (10.73)	66.83 (22.63)	53.36 (13.34)	16.46 (9.99)	69.81 (20.66)
Tirunelveli	56.35 (8.20)	2.18 (4.30)	58.53 (7.39)	55.17 (13.12)	15.88 (10.85)	71.05 (21.02)	55.18 (15.51)	13.17 (11.51)	68.36 (23.98)
Tirupathur	64.08 (5.66)	25.71 (3.55)	89.79 (8.74)	53.67 (21.82)	21.86 (9.90)	75.53 (31.39)	57.45 (19.61)	21.63 (10.72)	79.08 (29.30)
Tiruppur	65.86 (3.59)	9.93 (11.45)	75.79 (9.60)	63.84 (4.50)	17.56 (11.46)	81.4 (13.16)	66.4 (3.68)	17.21 (11.17)	83.61 (13.55)
Tiruvannamalai	57.21 (12.48)	24.43 (5.40)	81.64 (17.84)	49.66 (15.85)	18.87 (8.98)	68.54 (23.52)	51.68 (20.58)	19.48 (11.30)	71.16 (30.98)
Tuticorin	59.15 (13.50)	0.85 (3.54)	59.99 (13.99)	55.63 (13.99)	17.31 (11.01)	72.95 (22.55)	56.76 (14.29)	16.49 (12.39)	73.25 (23.75)
Vellore	60.46 (9.22)	16.08 (10.37)	76.54 (15.12)	56.04 (11.75)	19.06 (9.53)	75.09 (18.79)	56.33 (18.29)	14.81 (12.22)	71.14 (27.95)
Villupuram	44 (16.41)	18.81 (7.04)	62.81 (23.45)	52.99 (10.89)	18.33 (10.03)	71.32 (18.36)	57.79 (10.38)	19.03 (11.40)	76.83 (20.40)
Virudhunagar	59.5 (12.40)	6.09 (6.84)	65.59 (15.80)	48.02 (19.04)	17.13 (10.61)	65.15 (28.34)	50.76 (18.56)	17.59 (11.15)	68.35 (28.18)
Total	**55.57 (19.36)**	**14.38 (12.63)**	**69.95 (27.23)**	**56.92 (15.23)**	**17.35 (11.33)**	**74.27 (23.79)**	**56.95 (17.48)**	**16.13 (12.32)**	**73.09 (26.97)**

from 5.71 (± 10.89) for consistency and quality 2.42 (± 4.65) in 2021 to 55.57 (± 19.36) and 14.38 (± 12.63) in 2023. Similarly for P form Consistence and quality improved from 18.97 (± 17.99) and 7.85 (± 7.84) in 2021 to 56.92 (± 15.23) and 17.35 (± 11.33) in 2023. Similarly for L form Consistence and quality improved from 20.45 (± 2.13) and 8.5 (± 8.71) in 2021 to 56.95 (± 17.48) and 16.13 (± 12.32) in 2023. The progress in the performance is evident from the tables.

Table 3: S-form, P-form, and L-form performance over the years.

Year	Factors	S form reporting (n=10869)		P form reporting (n=5726)		L form reporting (n=4789)	
		Mean (SD)	Range	Mean (SD)	Range	Mean (SD)	Range
2021 to October 2023	Total Score	42.91 (21.07)	98	55.81 (24.39)	98	55.55 (27.83)	99
	Consistency	33.61 (14.67)	69	41.91 (15.94)	69	42.18 (18.28)	69
	Quality	9.31 (8.3)	29	13.89 (9.48)	29	13.36 (10.60)	30
2021	Total Score	8.14 (15.53)	94	26.82 (25.79)	98	28.95 (28.8)	98
	Consistency	5.71 (10.89)	66	18.97 (17.99)	69	20.45 (20.13)	69
	Quality	2.42 (4.65)	28	7.85 (7.84)	29	8.5 (8.71)	29
2022	Total Score	46.67 (28.62)	100	62.32 (30.75)	100	61.03 (33.55)	100
	Consistency	36.39 (20.73)	70	46.75 (21.52)	70	46.31 (23.42)	70
	Quality	10.28 (10.12)	30	15.58 (10.96)	30	14.73 (11.95)	30
2023	Total Score	69.95 (27.34)	100	74.27 (23.79)	100	73.09 (26.97)	100
	Consistency	55.57 (19.36)	70	56.92 (15.23)	70	56.95 (17.48)	70
	Quality	14.38 (12.63)	30	17.35 (11.33)	30	16.13 (12.32)	30

Table: 4 Number of outbreaks reported

Disease/ Illness	2021	2022	Upto October 2023
Acute Diarrhoeal Disease	13	17	14
Acute Gastro Enteritis/Food Borne Illness	1	0	5
Dengue	12	11	3
Diphtheria	5	2	2
Fever	3	3	0
Others / Food borne illness	6	28	9
Jaundice	1	1	4
Acute Hepatitis	0	0	2
JE	1	0	0
Leptospirosis	1	3	1
Mixed fever	4	5	0
Typhoid	2	0	0
Measles	0	1	4
Allergic Conjunctivitis	0	1	0
Chicken pox	0	13	15
Animal Bite - Dog Bite	0	0	1
Animal Bite - Others	0	0	1
ARI/Influenza Like Illness (ILI)	0	0	1
Cholera	0	0	5
Dysentery	0	0	1
Fever with Rash	0	0	6
Hepatitis A	0	0	3
Mumps	0	0	3
Only Fever < 7 days	0	0	9
Rubella	0	0	1
Scrub Typhus	0	0	1
TOTAL	**49**	**85**	**91**

Table 4 shows the number of outbreaks reported in IHIP-IDSP over the years. The early flagging of an event in the platform and conversion of the event into an outbreak over the years has been expressed. The trend of the outbreaks has varied since 2021 with acute diarrhoeal disease being the most common in 2021 to food borne illness in 2022 and chicken pox in 2023.

DISCUSSION

This study is the first of its kind in assessing a state's progress in IHIP-IDSP performance by the completion of S-form, P-form, L-form, mapping, case reporting and outbreak response. It shows the sectors where the performance of S/ P/ L form, Case reporting and Outbreak performance has been lacking in the state and the districts which have to be rectified to improve the performance. Over the years the performance has been increased in the IHIP-IDSP which probably could be due to the orientation training given to the stakeholders of the State and District surveillance unit and the transfer of that knowledge to the peripheral reporting units. Periodic refreshing training and weekly review and the knowledge and awareness could have played a major role in the improvement of the performances.

S-form performance has been improved over the years. The majority of the districts have been performing well in reporting of S-form with consistency while the quality of reporting has to be improved. The probability of poor performance in some districts could be due to the shortage of field staff due to superannuation or other administrative responsibilities. The poor performance noted in districts with major corporations are due to the lack of health subcentres where field staffs are available in the corporations. All districts are a combination of rural villages and urban corporations where some part of them (rural villages) update a part of the districts S form with exception of Chennai. Chennai corporation is a unique system, with no rural villages and affects the entire performance of the districts S form. For those districts, more emphasis has to be placed on identifying the right staff for reporting. In addition to replacing the deficiency of staff, improving the knowledge on the importance of updating the line list of cases identified in the field to improve the quality of reporting which on the other hand will help in identifying the impending outbreak is crucial. Consistency with the quality of reporting in S-form is of vital importance in solving the epidemiological challenge of the iceberg phenomenon.

P-form entry has also seen a remarkable improvement in the state. Compared to the S-form, P-form needs more time and knowledge on which disease should be considered in which category. This could be the reason for a lag in P-form performance compared to S-form performance. Most of the districts couldn't achieve their P-form performance similar to their S-form performance. P-form consistency is not equivalent with the S-form but the quality of P-form is above average and better than S-form as those reporting the P-form report the line list. Public and private institutions are included

in P-form reporting, which has proven difficult because most private institutions are either too small or too understaffed to devote the necessary staff to reporting the line list. In the same way, some government institutions are understaffed to maintain the P-form. In some public institutions, the change in the reporting person due to administrative reasons or due to a change in institution for educational reasons has been a major problem to be addressed.

L-form has also seen a remarkable improvement, but it has similar flaws to the P-form when compared to the S-form. Laboratory reporting of lab-confirmed cases is vital in the confirmation of disease diagnosis in taking appropriate measures to control the outbreaks. The consistency and quality of L-form reporting is similar to P-form. L-form reporting involves both public and private institutions and requires dedicated staff. Updating the results has been a hurdle to overcome in most reporting units which has to be managed with adequate staff, material resources and sensitization of the laboratories is vital.

As discussed in the reporting of S-form, P-form, and L-form updating the line list plays a major role in the performance. A line list helps to get a clear picture of the situation and the steps to be taken to prevent any outbreaks. Case reporting has seen steady progress in IHIP-IDSP with a gradual increase in line listing. The change in disease surveillance from IDSP to IHIP-IDSP is to get a quality line listing which was not available in IDSP where aggregate data was collected without the case details. More emphasis should be focussed on improving the knowledge and awareness about the vital role of line listing to the HCWs to reduce the hidden burden on them during outbreaks by preventing them.

Urban mapping was completed within a year of the initiation of IHIP-IDSP. Majority of the districts have completed their mapping while some corporations had issues in mapping. Certain major corporations had problems in urban mapping which has been addressed to the CSU and the progress is still in process which has further reduced the performance of few districts.

Outbreak response hasn't seen much progress as seen with other performance indicators. With changes in the definition and criteria for defining an outbreak, the flagging of an event has not seen a commendable improvement. The updating of RRT deployment, RRT composition and RRT updates are still inadequate in most events and outbreaks. Completion of line listing and update of the results of laboratory test is yet to reach the desired standards. In addition, DSO updates and timely completion of outbreaks is yet to be improved. With more awareness, the outbreak response can be improved to a benchmark level in the district which could also improve the state as a whole.

CONCLUSION

It's a cross-sectional study analysing secondary data extracted from IHIP-IDSP platform alone and HCWs direct participation was not a part of this study. The current evaluation of the monitoring of SSU over DSUs and DSUs over the HCWs from the peripheral reporting units were not collected. The current manpower in the DSUs and peripheral units were not collected and analysed. The comparison of the performance of IDSP before 2021 was not compared with the current IHIP-IDSP.

It is evident from the above findings that there is a scope for improvement in the performance of the state in IHIP-IDSP by improving the performance of districts. The major elements to be addressed in the districts are to improve the human resources in the peripheral reporting units, periodic refreshment training for the HCWs, and monitor their performance at timely intervals. All level reporting HCWs from the SSUs, DSUs and the peripheral reporting units should be allowed to provide periodic feedback on the hurdles in reporting. Frequent refreshing training for the HCWs from both public and private institutions with a pre- and post-training assessment is of utmost importance to maintain sustainable performance. The quality of training should be improved by emphasizing mock exercises and hands-on skills in reporting. Timely auditing of the resources available and the functionality of the resources to ensure efficient reporting is vital.

All DSUs should ensure that every HCW nominated for reporting in IHIP-IDSP is aware of the job responsibilities and they are properly trained in handling the platform. The SSUs should monitor the DSUs and provide training for the new HCWs recruited for the DSUs and refreshment training for the existing HCWs. Every DSU and SSU should have a dedicated RRT who will be ready to respond to any impending outbreak or existing outbreak and they should be aware of their role and responsibilities in IHIP-IDSP updating and the field activities.

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ORIGINAL ARTICLE - PUBLIC HEALTH

EFFECTIVENESS OF CONTEMPORARY TASK ORIENTED APPROACH BASED OCCUPATIONAL THERAPY INTERVENTION FOR CHILDREN WITH HANDWRITING AND FINE MOTOR DIFFICULTIES

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Abstract

AIM: To find the effectiveness of contemporary task-oriented approach-based occupational therapy intervention for children with handwriting and fine motor difficulties. Objectives: To screen handwriting and fine motor difficulties by using evaluation tools of children with handwriting (ETCH-M). To assess handwriting and fine motor difficulties by using fine motor skills checklist (6-12). To determine the effectiveness of contemporary task-oriented approach-based occupational therapy intervention for children with handwriting and fine motor difficulties. To evaluate the alphabet writing, numeral writing, near point copy, far point copy, dictation, sentence composition by using the Evaluation tool of children with hand writing (ETCH).

METHODOLOGY : Totally 74 subjects (37 in experimental group and 37 in control group) of age group of 6 to 12 years participated in current study.

RESULTS: Significant reducing in handwriting and fine motor difficulties, with regard to contemporary task-oriented approach-based occupational therapy intervention for children with handwriting and fine motor difficulties.

KEYWORDS : Contemporarytaskorientedapproach, handwriting, fine motor difficulties, Occupational therapy, ETCH.

INTRODUCTION

Handwriting all the way through narration and in all cultures has been a means for children and adults to communicate ideas and information. Despite the extensive use of knowledge and word processors today, the assignment of handwriting consumes much of the school day for elementary school-aged children. At school, children are expected to copy numbers for arithmetic computations, reproduce spelling words, compose creative stories and take notes.[5] A functional written message is needed at home, when children write "thank you" notes, play word games, dictate telephone messages and numbers.[18]

In the school setting, educators are accountable for handwriting instruction which usually occurs in the primary grades. Accomplishing the technicalities of handwriting in the early elementary years, children are better able to perform daily school activities which require handwriting production.[8] Automatic creation of the written language, children are able to go forward to higher-level writing tasks such as story composition and advanced arithmetic, which necessitate incorporated and multifarious cognitive process.[7] Children who are unable to master indispensable handwriting often experience difficulty in academic recital.[7] Characteristic handwriting troubles present as the illegible script, evasion of writing due to the demanding effort to produce a manuscript, lack of automaticity of handwriting,

and the incapability to stay pace with written schoolwork.[6]

Children by means of handwriting difficulty are often referred to occupational therapists and learning specialists at private and public schools, children's hospitals, paediatric clinics, and private professional practice.[4] In India, children who are experiencing difficulty with academic and school performance are mandated a free and appropriate public education as adopted by national legislation in 1995. As a result, occupational therapists working in school systems are frequently requested to evaluate certain functional problems which are interfering with a child's ability to perform educational activities.[15] Complexity with handwriting production is one of them for the most part common reasons for referring school-aged children to occupational therapy in the school setting.[3,17]

Occupational therapists repeatedly evaluate children who are experiencing trouble with handwriting. The role of the occupational therapist is to establish which domains of handwriting are problematic for student.[14] Influential which,

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27

if any, essential sensory, the visual motor, the cognitive or psychosocial deficit is inquisitive with handwriting invention, and which environment variables are affecting recital in the classroom, are addressed by the pediatric occupational therapy practitioner.[13] A scrupulous occupational therapist evaluation of a child's handwriting typically includes in sequence and gathered her from interviewing the teacher, parent, and supplementary team members, observing the child inscription in the classroom, comparing the child's handwriting production to that of peers, and administering formal and informal tests.[5,9]

Handwriting is a multifarious activity that involves widespread research in regulating to master the mandatory skills. Elementary-age children spend a large part of their day participating in fine motor activities connecting handwriting in subjects such as math, reading, spelling, social studies, and science.[8,20] The relevance of handwriting to a child's education is signified determine the effects of group-task-oriented training on gross and fine motor function, activities of daily living (ADL), and social function of children.[1,12]

Prime of life of evidence-based motor intercession children with handwriting difficulties, an implementation by the quantity of in-class time spent in executing activities that require the skill of handwriting.[2,10] The contacted Multi-sensory Approach compared to a Task-Oriented Approach on Handwriting Legibility amongst Elementary School Children revision was preschool students spend an average of 37% of their school day engaged in fine motor activities, of which 10% are paper-and-pencil tasks.[11,22] Handwriting and writing program co-taught by teachers and occupational therapists for first-grade children students spend up to 46% of their day completing fine motor activities, of which 42% are paper-and-pencil tasks.[19,28]

Handwriting associated activities start near the beginning of a child's education and increase in importance as the child advances in his or her basic education.[21,24] petite-group format with entrenched individualized supports allows the therapist to guide and monitor student performance, Handwriting difficulties may affect up to 27% of school-age children, with up to 60% of the school day constant to fine motor activities.[23] Hence, the early identification and remediation of handwriting deficiencies before the child reaches middle and high school when handwriting demands increase in convolution and intensity can prevent difficulties allied with handwriting.[25]

Handwriting/fine motor difficulties are well documented as serious hindrances to academic learning for kindergarten and elementary school children.[21] Intercession techniques to remediate these troubles have been researched by educators and occupational therapists.[26] Efficient occupational therapy interventions have been found to include visual-motor tasks, kinaesthetic and dexterity training, and motor planning strengthening actions. Occupational therapists, mandated by the persons with Disabilities Education Act, work with these students in the school setting to enhance handwriting and fine motor skills to meet classroom curriculum hassle. In India, teachers have reported a high occurrence of students with these deficits in their classrooms yet reported a low occurrence of referral to occupational therapists for intervention.[15]
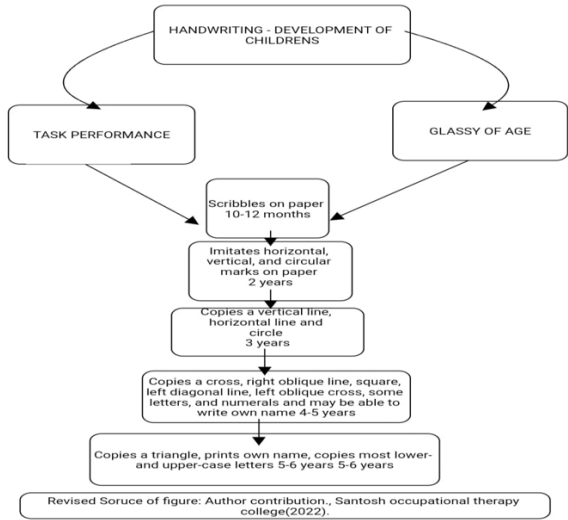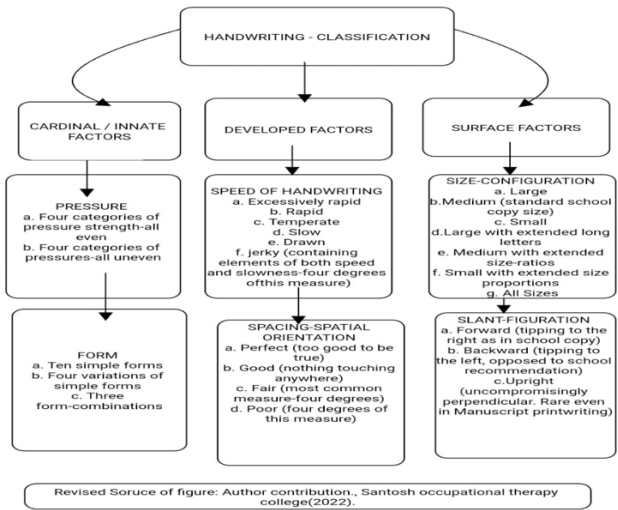

Figure:1

Figure:2

Paediatric occupational therapists Intervention application of weights as a treatment modality focusing on higher-level processes employ a task-oriented approach includes the use of various strategies while teaching handwriting such as the use of sensory-motor approach.[27] A task-oriented approach is based on the assumption that handwriting acquisition

requires direct instruction and practice in different tasks and environments[21] and is often associated/combined with motor learning principles of practice was more pronounced for the judgments of boys because, in Grades2, their conduct was perceived as less adequate than was girls' behavior.[29,30]
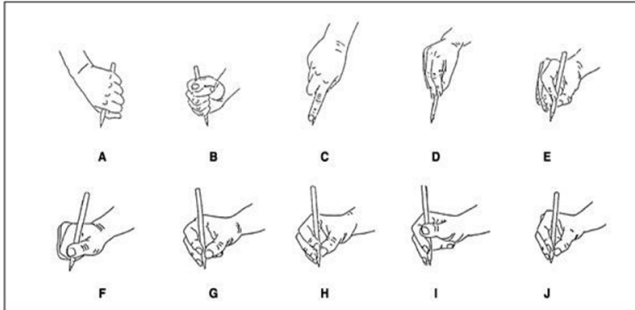
A = radial cross palmar grasp; B = palmar supinate grasp; C = digital pronate grasp, only index finger extended; D = brush grasp, E = grasp with extended fingers; F = cross thumb grasp; G = static tripod grasp; H = four fingers grasp; I = lateral tripod grasp; J = dynamic tripod grasp.

Figure:3

Resources: J. Case-Smith & C. Pehoski (Eds.). Development of hand skills in the child

AIMS

To find the effectiveness of contemporary task-oriented approach-based occupational therapy intervention for children with handwriting and fine motor difficulties.

OBJECTIVES

• To screen handwriting and fine motor difficulties by using evaluation tools of children with hand writing (ETCH-M).

• To assess handwriting and fine motor difficulties by using fine motor skills checklist (6-12)

• To determine the effectiveness of contemporary task-oriented approach-based occupational therapy intervention for children with handwriting and fine motor difficulties.

• To evaluate the alphabet writing, numeral writing, near point copy, far point copy, dictation, sentence composition by using the Evaluation tool of children with hand writing (ETCH).

HYPOTHESIS

NULL HYPOTHESIS: The null hypothesis states that there will be no significant "Effect of Contemporary Task-Oriented Approach Based Occupational Therapy Intervention for Children with Handwriting and Fine Motor difficulties."

ALTERNATIVE HYPOTHESIS: The alternative hypothesis states that there will be a significant "Effect of Contemporary Task-Oriented Approach Based Occupational Therapy Intervention for Children with Handwriting and Fine Motor difficulties."

METHODOLOGY

STUDY DESIGN: The study is done with two groups of pre-

test and post-test of quasi-experimental design (Pre-Post Experimental Study).

• Experimental group=pretest and post-test.

• Control group = pre-test and post-test.

SOURCE OF DATA: Brain child rehab centre, Karur, Tamilnadu.

SAMPLE SIZE: 1. Consecutive samples of 74 subjects will be taken in this study.

2. The subjects will be divided into two groups the experimental (regular paediatric occupational therapy)and control group (irregular without occupational therapy) (37 each).

METHOD OF DATA COLLECTION

INCLUSION CRITERIA:

• Children with handwriting and fine motor difficulties

• Between the ages 6-12 years.

• Both males and females will be included.

EXCLUSION CRITERIA:

• Age should not be more than 12 years or less than 6 years.

• Lack of voluntary control or cognitive function.

• Lack of basic head stability during upright positioning.

• Vision or hearing is not sufficient to participate in self-rating scales.

• Children with neurologic problems.

SAMPLING TECHNIQUE: Random sampling technique was adopted.

MATERIALS AND TOOLS REQUIRED

MATERIALS REQUIRED: Testing materials are the examiner's manual, master response booklets, master score sheets, task sheets, wall charts, quick reference sheets, scoring card, a stopwatch, and two No. 2 pencils. The stopwatch and pencils are not included in the test kit. A description of materials follows below.

Table: 1 the seven tasks of the etch-m (etch-m) measure the fol-

A.	Task 1 writing alphabet from memory
B.	Task ii writing numerals from memory
C.	Task iii near-point copying
D.	Task iv far-point copying
E.	Task v manuscript-to-cursive transition
F.	Task vi dictation
G.	Task vii sentence composition

OUTCOME MEASURES:

- Evaluation tool of children with handwriting (ETCH)

The ETCH contains seven cursive writing tasks and six manuscript writing tasks plus items addressing the child's ability to handle the writing tool and paper. Although each task represents a distinct handwriting skill used by children in educational settings, the entire test should be administered as a unit.

RELIABILITY

A study measuring test-retest reliability of the ETCH-Manuscript with early elementary children is in progress. The study will provide information related to the stability of the children's ETCH scores over time. In other words, an acceptable level of test-retest reliability will give a practitioner confidence that when a child's test scores change from the beginning to the end of the academic year, it truly reflects changes in performance and not test error. Another study addressing ETCH-Cursive test-retest reliability is also needed.

VALIDITY

Studies using the ETCH and other tests that measure areas such as visual-motor control, motor planning, self-esteem, and in-hand manipulation related to handwriting are suitable validity investigations. The relationship of these performance components with functional handwriting of groups of children with various conditions (e.g., attention deficit hyperactive disorder, learning disabilities) would be worthwhile to examine. A critical and planned validity study will address the relationship of legible letter and legible word percentages to the readability of handwritten passages. Legibility percentages of the manuscript and cursive handwriting samples from the ETCH will be compared to educators' judgments about easy-to-read and difficult-to-read samples.

VARIABLES

- Independent variables- Contemporary task-oriented approach + Occupational therapy intervention
- Dependent variables- Handwriting and fine motor difficulties.

Table: 2 Experimental group: pediatric occupational therapists intervention based on contemporary task-oriented approach –session schedule- handwriting and fine motor difficulties.

Table: 2 Treatment-protocol

Week 1	Warm-up	Main activities
Session 1:	Arm wake-up Pencil aerobics	Pre-Handwriting assessment ETCH-M
Session 2:	Bandage grab Handwriting patterns to music	Feel the pressure multisensory stimulation Tip to tail
Session 3:	Rubber band stretch Doodle loops	Alphabet write Letter lists
Week 2	Warm-up	Main activities
Session 1:	Arm wake-up Pencil aerobics	Alphabet write Dictation
Session 2:	Bandage grab Handwriting patterns to music	Near-point copy Eyes shut patterns
Session 3:	Doodle loops Heavy/light	Far-point copy Feel the pressure
Week 3	Warm-up	Main activities
Session 1:	Arm wake-up Pencil aerobics	Dictation Eyes shut writing
Session 2:	Bandage grab Handwriting patterns to music	Free-writing
Session 3:	Heavy/light Doodle loops	Near-point copy Eyes-shut writing
Week 4	Warm-up	Main activities
Session 1:	Arm wake-up Pencil aerobics	Far-point copy Eyes shut writing
Session 2:	Bandage grab Handwriting patterns to music	Free-writing
Session 3:	Rubber band stretch Doodle loops	Dictation Feel the pressure
Week 5	Warm-up	Main activities
Session 1:	Arm wake-up Pencil aerobics	Near-point copy Eyes-shut patterns
Session 2:	Bandage grab Handwriting patterns to music	Far-point copy Eyes shut writing
Session 3:	Feel the pressure Doodle loops	Free-writing Carbon paper
Week 6 &7	Warm-up	Main activities
Session 1:	Arm wake-up Pencil aerobics	Alphabet write Letter lists
Session 2:	Bandage grab Handwriting patterns to music	Write a letter
Session 3:	Doodle loops	Post-Handwriting assessment ETCH-M
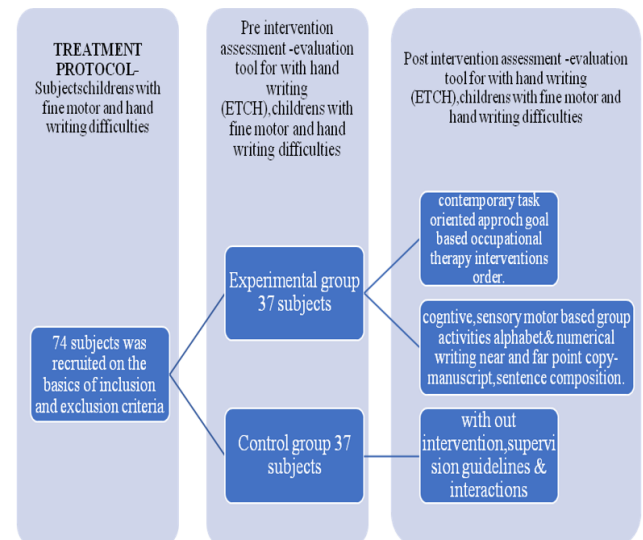
Figure:4

INTERVENTION

A total of 74 subjects will be taken in this study. The subjects will be selected from the age group between 6 to 12 years with handwriting and fine motor difficulties. The subjects will be divided into two groups; a control group (without or irregular therapy children) and an experimental group (regular occupational therapy children).

The therapy is planned for Three months. It will be at 45 minutes group session with the frequency of six days a week. Total of 07 treatment sessions (each session of 6 days) is planned for children in both control and experimental group.

STUDY PLACE

Brainchild rehab centre, Karur, Tamilnadu.

DATA COLLECTION OR STATISTIC ANALYSIS

- This study used two groups of populations were collected

the data of pre and post-intervention.

• The entire statistical test was performed using statistical package for social sciences (SPSS) version 21 & graph pad instate software version 3.1 respectively.

RESULTS

The study involved 74 subjects and carried ousted on 90 -days for quasi experimental design. The subject was allotted two groups one experimental and group one control group. The control groups enhance conventional interaction activities and the experimental group performed a Contemporary Task-Oriented Approach Based Occupational Therapy Intervention for Children with Handwriting and Fine Motor difficulties, the results show the experimental group was statistically significant and the null hypothesis was rejected respectively.

Table: 3 Contemporary Task-Oriented Approach Based Paediatric Occupational Therapy Intervention for Children with Handwriting and Fine Motor difficulties pre and post Samples Statistics-SPSS

Tasks of the ETCH-M	Pre experimental test mean value , (SD value)	Post experimental mean value, (SD value)	P value	Pre control test mean value, (SD value)	Post control test mean value, (SD value)	P value
Alphabetic Upper-Case Letter	42.97 (20.37)	72.08 (,16.84)	0.0001	43.00 (20.33)	43.00 (20.47)	0.0000
Alphabetic Lower-Case Letter	42.76 (12.45)	64.54 (,11.40)	0.0001	43.70 (12.36)	43.54 (12.48)	0.8614
Numbers	39.05 (14.33)	64.76 (,13.34)	0.0001	39.03 (14.87)	39.43 (14.11)	0.9036
Near Point Copy	45.08 (15.31)	71.00 (11.19)	0.0001	45.05 (15.52)	44.89 (16.09)	0.9355
Fair Point Copy	53.00 (19.60)	73.97 (14.72)	0.0001	55.68 (19.88)	55.41 (19.33)	0.8798
Dictation	52.57 (20.94)	72.68 (17.22)	0.0001	52.59 (20.78)	52.68 (20.68)	0.7525
Sentence Competency	44.49 (19.27)	73.11 (,16.92)	0.0001	44.59 (19.34)	45.27 (19.54)	0.7308
Total Letters Legibility	45.81 (20.39)	64.86 (20.91)	0.0001	47.73 (20.34)	48.38 (20.38)	0.7308

Table: 4 Demographic Characteristics of Subjects

S.NO	BASELINE OF CHARACTERISTICS	GROUP 1 CONTROL GROUP	GROUP 2 EXPERIMENTAL GROUP
1	Number of subjects	37	37
2	Age range	6-12	6-12
3	Mean age	9.44	10.33
4	Gender male/ female	18/19	18/19
5	Handwriting and Fine Motor	handwriting /evaluation	handwriting / evaluation
6.	Task completion	Total letter legibility	Total letter legibility

After tabulation and statistical analysis, these study results have shown significant improvement in handwriting and fine motor skills among children.

DISCUSSION

The purpose of the study is to determine the Effectiveness of "Contemporary Task-Oriented Approach Based Occupational Therapy Intervention for Children with Handwriting and Fine Motor difficulties.

The evaluation tool for children with handwriting (ETCH-M) scale is the pre-test and post-test measurement tool. This scale is used to evaluate the level of hand writing and fine motor difficulties among 6-12 years children's. Initially, Handwriting and fine motor difficulties children were selected based on the inclusion criteria were assessed using the evaluation tool for children with handwriting to get the pre-test values. Contemporary task orientation approach-based occupational therapy sessions were scheduled and administered for 3 months one week. 7 sessions per week on alternative days each session lasted for1 an hour after the treatment sessions the post-test values were collected and tabulated.

These results are supported by Jo Tennyson et.al(Humboldt state university ,2006) Effective occupational therapy interventions have been found to include visual-motor tasks, kinaesthetic and dexterity physical activity, and motor planning/strengthening activities. Occupational therapists, instructed by the Individuals with Disabilities Education Act, work with these students in the school setting to enhance handwriting/fine motor skills to meet classroom curriculum demands Handwriting/fine motor difficulties are well standard as thoughtful hindrances to the academic scholarship for kindergarten and elementary school children.

CONCLUSION

Contemporary Task-Oriented Approach Based Occupational Therapy Intervention for Children with a variety of Handwriting and Fine Motor difficulties and its role in enhancing participation and improving handwriting of fine motor skills and also to facilitate children's academic performance and task orientation day to day life meaningfully. The contemporary task-Oriented Approach focuses on the child's goal setting and decision making, thereby enhancing motivation and promoting active commitment to recovery. Task analysis includes an understanding of the nature task, Internal and external factors contexts that both facilitate and impede performance.

LIMITATION

• The sustained period of the attention span of the children was not constant for the entire 45 minutes of intervention.
• Children in the control group were irregular in interactive activities and follow-ups.
• For children in the experimental group, other treatments were not indicative, only Contemporary Task-Oriented Approach Based Occupational Therapy Interventions were carried out.
• This study carried out on a particular state-district population area of people
• This study was done in a partial duration of time
• This study was done under a school-based intervention

RECOMMENDATIONS

• This study review for Contemporary Task-Oriented Approach Based Occupational Therapy Intervention for Children with Handwriting and Fine Motor difficulties is tremendously positive, further studies with larger sample sizes and more demanding methodologies are still suggested.
• Further investigation from different states and regions is essential to find out the effectiveness of Contemporary Task-Oriented Approach Based Occupational Therapy Intervention for Children with Handwriting and Fine Motor difficulties.
• Negligible variations can be done in the period of intervention such as reducing the length of each period and increasing the number of sessions.

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ORIGINAL ARTICLE - PUBLIC HEALTH

FACTORS ASSOCIATED WITH UNCONTROLLED HYPERTENSION AMONG REGISTERED HYPERTENSION PATIENTS IN PUBLIC HEALTH FACILITIES OF THANJAVUR DISTRICT, TAMIL NADU, INDIA, 2019: A CASE CONTROL STUDY

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Abstract

BACKGROUND: Hypertension Is a major risk factor for cardio vascular disease.Govt.of Tamil Nadu implemented state wide hypertension screening and management program since 2011. Only half of the hypertension patients treated in public health facilities in Thanjavur district had their blood pressure under control(systolic bloodpressure <140mmHg, Diastolic blood pressure <90mmHg). We determined the risk factors associated with lack of hypertension control among hypertension patients who registered in public health facilities in Thanjavur District, Tamil Nadu, 2018

METHODS : We conducted a case-control study among the hypertensive patients who registered in two different public health facilities of Thanjavur district in Tamil Nadu. Patients who had latest two BP recordings were controlled (BP less than 140/90) in one year reference period were taken as control and patients who had latest two BP recordings or any one of the latest two BP recordings were uncontrolled (BP equal and above 140/90) were taken as a case. We calculated a sample size of 160 for cases and 160 for controls. We used a structured questionnaire to collect information. Crude and adjusted odds ratio with 95%confidence interval were calculated by logistic regression.

RESULTS : We recruited 160cases and160controls in Primary Health Care centres. Spss version 23 software was used for analysis. Age, gender, education, occupation, marital status, smokeless tobacco, duration of missing tablets, drug prescription status and knowledge of complications were not associated with uncontrol hypertension. Missing tablets more than seven days (OR 2.2;95%CI (1.0 − 4.6)) and being male (OR 13.6; 95%CI 1.7 − 106.8) was associated with uncontrolled hypertension.

CONCLUSION : Lack of adherence to medications despite dispensing of drugs for 30 days in the public health facilities was a riskfactor for uncontrolled hypertension.Medical officers and staff nurses should emphasize patient counselling with more focus on males. Systems should be developed to monitor adherence, such as phone call or SMS based reminders.

KEYWORDS : Adherence, hypertension, primary health centre,Uncontrolled.

INTRODUCTION

Noncommunicable diseases (NCDs) are the leading cause of death worldwide. According to the World health organization NCD report, NCD was responsible for 71%(41 million) of the 57 million deaths which occurred globally in 2016.[1] In 2019, major NCDs responsible for the deaths included cardiovascular diseases (17.9 million deaths, accounting for 44% of all NCD deaths and 31% of all global deaths).[2] One of the critical risk factors for Cardio Vascular Diseases (CVD) is Hypertension. Raised blood pressure can cause coronary heart disease, chronic kidney disease, and ischaemic as well as a haemorrhagic stroke. As perthe 2013 WHO report, globally, 9.4 million deaths occurred every year due to hypertension complications.[3]

In India, hypertension led to1.63million deaths in 2016 as compared to 0.78 million in1990.[4] In 2014, about 33% urban and 25% of rural Indians were hypertensive. Among them, 25% rural and 42% urban Indians were aware of their hypertensive status. One-tenth of rural and one-fifth of urban\hypertensive patients had their BP under control.[5]

In Tamil Nadu, the proportion of total disease burden from Noncommunicable diseases was 65.3%, and leading causes of DALYs (2016) due to Ischemic heart disease was 14.3%. The risk factors driving to most of the death and disability are dietary risks, followed by high blood pressure, high body-mass index, high total cholesterol, tobacco use and alcohol and drug use.[6]

In 2018, Lancet published the changing patterns of cardiovascular diseases and their riskfactors in India. Coronary heart disease-related deaths have increased in Tamil Nadu,Karnataka, Punjab and Haryana from 1990 to 2016.[7] Heart disease, stroke and diabetes cause loss of billions of dollars to national income each year in the world's most

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populous nations and rising healthcare expenditures can lead to financial catastrophe, forcing households into poverty or deepening their existing poverty.

In Tamil Nadu, the NCD intervention programme was implemented in 2011, in all public health facilities. The programme aimed at early diagnosis, counselling and treatment for hypertensive patients. In this programme, opportunistic screening is done for NCDs namely hypertension, diabetes, cervical and breast cancer for individuals aged 30 years and above who are visiting public health facilities and medicines are given for 30 days free of cost.

This NCD programme was evaluated in 2012 in Thanjavur district public health facilities for hypertension screening and management. The evaluation indicated that 49% of hypertension patients who had treatment in public health facilities in Thanjavur district had their blood pressure under control (systolic blood pressure <140mmHg, Diastolic blood pressure <90mmHg). There are limited studies in India to understand the factors associated with hypertension awareness, treatment and control; however, no such study has been done in Tamil Nadu state so far.

The objective of the study was to determine the factors associated with uncontrolled hypertension among registered hypertension patients in public health facilities in Thanjavur district of Tamil Nadu.

METHODOLOGY

STUDY DESIGN: We conducted a case-control study (1:1) to identify the factors associated with uncontrolled blood pressure among patients with hypertension. Hypertension registered in selected public health facilities for one year from January1,2018, to December 31,2018.

STUDY AREA: We conducted this study in Thanjavur district, which is located in the mid-eastern part of Tamil Nadu. The study population includes patients with hypertension who were registered in two block-level primary health centres in Thanjavur district. 2 block primary health centres were purposefully selected by based on maintenance of records keeping well. Kabisthalam is a block primary health centre located in Cauvery river bed area, in the northern part of Thanjavur district and has a population of 1,10,748(census 2011) and Thamarankottai is a block primary health centre which is located in coastal area, in the south-east part of Thanjavur district with a population of 1,13,231(census 2011).

STUDY POPULATION: The study participants were hypertension patients aged 30years and above registered and

on follow up for treatment in the two selected primary health care facilities from January1, 2018, to December 31 2018. Patients were identified from patient clinic cards maintained in the health facilities with details on treatment and follow up for hypertension. We generate the line list of all uncontrolled hypertension patients and hypertension under control patients As per case definition, case and control selected by simple random sampling from the line list Cases and controls equally distributed in the two primary health centres. The patient clinic card contains a complete patient medical record including demographics, medical history, BP measurements and drug prescription.

INCLUSION CRITERIA: The patient cards with at least three follow up BP recordings between January 1, 2018, and December 31 2018, and the two latest BP recordings at the one-month interval were included in the study.

EXCLUSION CRITERIA: The patient cards with less than three BP recordings during follow up visits in 2018, incomplete data, hypertension diagnosis less than four months and the latest two BP. Recordings, not at the one-month interval were Excluded.

OPERATIONAL DEFINITIONS

HYPERTENSION: Hypertension was diagnosed as systolic blood pressure ≥140 mmHg or diastolic bloodpressure ≥ 90 mmHg in two different measurement half an hour apart as per the programme protocol.

HYPERTENSION UNDER CONTROL: Based on two consecutive BP measurement, if the two recordings had systolic bloodpressure<140mmHg and diastolic blood pressure<90mmHg.

UNCONTROLLED HYPERTENSION: Based on two consecutive BP measurements, if one or both the recordings had systolic blood pressure≥140mmHg or/and diastolic blood pressure≥90mmHg

In a case-control study, case were patients with uncontrolled hypertension and control were patients with hypertension under control.

SAMPLE SIZE: We calculated the sample size based on the following assumptions: Non-adherence among the control group as 38%(program evaluation data), level of significance as 5%, power as 80%, the ratio of controls & cases as 1, the expected odds ratio of 2 and 10% as non-response.The estimated sample size was 160cases and160controls.

SAMPLING PROCEDURES: We collected all available hypertension patient clinic cards from two primary health centre's for the reference period of January 1, 2018, to December 31 2018. We created the line list of all hypertension

patients with BP under control and BP not under control. We randomly selected the cases and controls as per the desired sample size from the line list. Selection of cases and controls were equally distributed in the two primary health centres.

DATA COLLECTION

DATA EXTRACTION FORM: The patient clinic cards were reviewed to collect data for variables namely age, gender, address, phone number, education, occupation, risk factors like BMI, comorbidities, smoking, alcohol, BP measurement values and prescription details.

INTERVIEW OF PATIENTS: The patients were interviewed by well-trained paramedical staff using a semi-structured questionnaire. The information on socio demographic characteristics, treatment adherence,a ccessibility to health facilities, lifestyle modification, health-seeking behaviour and knowledge on hypertension were collected. Interviews were conducted in the local language, Tamil. We measured the blood pressure of patients at the time of interview.

ANALYSISPLAN: Based on patient treatment card, we calculated the descriptive statistics for various factors. We analyzed the frequencies of various risk factors among cases and controls.We did the univariate analysis to find the crude odds ratio with 95% CI for various riskfactors. We did the logistic regression to determine the independent predictors foruncontrolled hypertension. We did the analysis using Epi info version 7. A P-value of lessthan 0.05 is taken as statistically significant. We computed the proportion of reasons fornot taking medicines regularly among hypertension patients who were not taking medicines regularly.

HUMAN SUBJECTS PROTECTION: Approval from the NIE Ethics Committee was obtained before the commencement of study. Permissions were obtained from the Deputy Director of Health services before the commencement of the study. Every hypertension patient selected as case and control was informed about the purposeof the study by information sheet which was provided in the local language Tamil andwritten consent for participation in the study was obtained. The patient information was kept confidentially and not used for analysis or dissemination. All the study participants were counselled regarding the importance of taking drugs regularly without missing as per prescription and creating awareness about the consequences of hypertension to prevent cardio vascular disease, stroke and premature death. The care takers of some patients were encouraged to giving moral support to elderly patients.

RESULTS

We reviewed the available patient's cards in two PHC to estimate the total number of patients. PHC Kabisthalam and PHC Thamarankottai had 1200 and 820 cards respectively. After applying the eligibility criteria, 600 (50%) and 460 (56%) were eligible for the study. Among the eligible patients, we reviewed the blood pressure to classify the cases and controls. (Figure1)
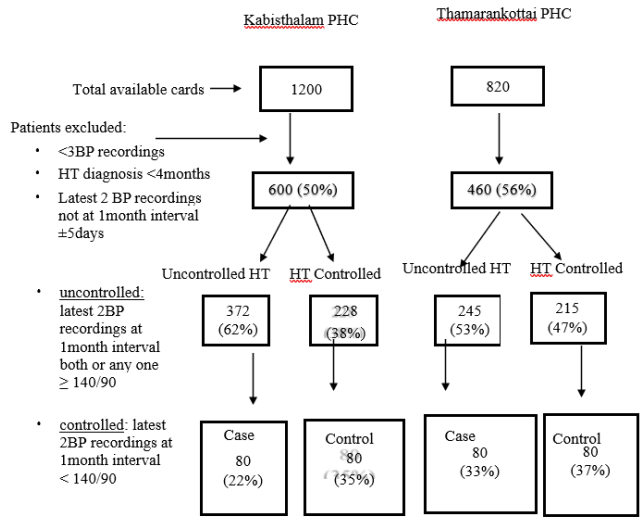
Figure 1: Patients selection for cases and controls

We recruited 160 case patients and 160 control patients. More than half of the (63%)cases were above 60 years of age (median 60 years, IQR 55 – 67 years) and 58 %(median 60 years, IQR 51 – 69) in controls. 56 per cent of cases and 68 per cent of controls were females.

We compared socio demographic characters like age, gender, educational status, occupation and marital status among cases and controls. There was a significant difference in the proportion of males among cases and controls. Other risk factors were similar among cases and controls. (Table: 1) We did univariate analysis for various risk factors. Among the socio-demographic characters, age (OR- 1.0; 95%CI 0.9 – 1.0), education (OR-1.6; 95%CI 0.8 – 3.1),occupation(OR-1.3; 95%CI0.8–2.1) and marital status(OR-0.7; 95%CI 0.4 – 1.1) were not associated with uncontrolled hypertension. Being male (OR- 1.7; 95%CI 1.6 – 2.6)was significantly associated with uncontrolled hypertension. (Table: 2)

Among the risk factors, currently tobacco smoking (OR-1.1; 95%CI 0.4 – 3.2), currentlysmokeless tobacco use (OR-0.7; 95%CI 0.4 – 1.2), current alcohol consumption (OR-0.9;95%CI 0.4 – 2.2), BMI (OR-0.9; 95%CI 0.5 – 1.4) and physical activity (regular walk forat least 3days/week, playing sports at least twice a week and doing yoga at least twice aweek) (OR-0.8; 95%CI 0.5 – 1.3) were not significantly

associated with uncontrolled hypertension.(Table:2)

System-related factors like distance from their places to health facility more than five kilometres (OR-1.1; 95%CI 0.6 – 2.1) and drugs prescription with more than one drug(OR-1.1; 95%CI 0.8 – 3.3) were not significantly associated with uncontrolled hypertension.(Table: 2)

A patient who were not taking medicines regularly, the duration of missing tablets being more than seven days (OR-2.2; 95%CI 1.0 – 4.6) were significantly associated with uncontrolled hypertension.

Treatment duration for more than three years (OR - 1.2; 95% CI 0.8 – 1.9) and presence of comorbidity condition (OR-1.1; 95%CI 0.7 – 1.7) were not significantly associated with uncontrolled hypertension. (Table: 2) Knowledge related variables such as lack of knowledge on hypertension, lack of knowledge on consuming medicines daily (OR-1.0; 95%CI 0.62 – 16.1), lack of knowledge on consequences of hypertension(OR-0.6; 95%CI0.3–1.2) and lackof knowledge regarding need for treatment despite absence of any hypertensive symptoms (OR-1.2; 95%CI 0.7 – 2.3) were not significantly associated with uncontrolled hypertension.(Table:2)

We did stratified analysis to identify confounders and effect modifiers. Lack of adherence to medications for 7 or more days was modified by gender with significant difference in the stratum specific OR, odds being higher among males(OR13.6; 95%CI1.7– 106.8)as compared to females (OR 0.8; 95%CI 0.3 – 2.3). Since gender was effect modifier, we did not adjust for gender in the multivariate analysis. (Annexure-Table)

Table1: Socio demographic characteristics of hypertensive patients who registered in public health facilities in Thanjavur District of Tamil Nadu, 2019

Socio demographic characteristics		Uncontrolled HT N=160		HT under control N=160		P-value
		n	%	n	%	
Age (in year)	30 - 39	4	3	2	1	0.316
	40 - 49	17	10	29	18	
	50 -59	38	24	36	23	
	≥ 60	101	63	93	58	
Gender	Male	69	43	50	31	0.028
	Female	91	57	110	69	
Education	Illiterate	56	35	71	44	0.393
	Primary	47	29	41	26	
	Middle	31	20	27	17	
	High school & above	26	16	21	13	
Marital status	Married	111	69	123	77	0.13
	Others(Unmarried widow/separate)	49	31	37	23	
Occupation	Employed	10	6	7	4	0.395
	Daily Wage labour	57	36	68	43	
	Others (Retired, Home maker, Unemployed)	93	58	85	53	

Table 2: Univariate analysis for factors associated with uncontrolled hypertension among the registered hypertension patients in public health facilities in Thanjavur district

Socio demographic Characteristic		Uncontrolled HT N=160		HT under control N=160		Crude OR	95%CI
		n	%	n	%		
Age(in year)		160	100	160	100	1	(0.9-1.0)
Gender	Male	69	43	50	31	1.7	(1.6 -2.6)
Education	Illiterate	56	35	71	44	1.6	(0.8-3.1)
	Primary	47	30	41	26	1.1	(0.5-2.2)
	Middle	31	19	27	17	1.1	(0.5-2.3)
Occupation	Daily Wage labour	57	36	68	43	0.8	(0.3-2.1)
	Others (Retired, Home maker, Unemployed)	93	58	85	53	1.3	(0.8-2.1)
Marital status	Married	111	69	123	77	0.7	(0.4-1.1)

Education	Illiterate	56	71	3.1)
	Primary	47	41	2.2)
	Middle	31	27	2.3)
Occupation	Daily Wage labour	57	68	2.1)
	Others (Retired, Home maker, Unemployed)	93	85	2.1)
Marital status	Married	111	123	1.1)

Risk factors		Uncontrolled HT N=160		HT under control		Crude OR	95% CI
		n	%	n	%		
current smoking		9	6	9	6	1.1	(0.4-3.2)
current smokeless tobacco use		49	31	39	24	0.7	(0.4-1.2)
Currently using		13	8	12	7	0.9	(0.4-2.2)
BMI	Underweight	17	11	18	11	1	(0.5-2.1)
	Overweight	66	41	60	38	1.2	(0.7-1.9)
	Obese	17	10	18	11	1	(0.5-2.1)
Do Physical activity		41	26	49	31	0.8	(0.5-1.3)
System related characteristic							
Drugs prescription with >1drug		50	31	53	33	1.1	(0.8-3.3)
distance from their places to health facility >5km		25	16	28	17	1.1	(0.6-2.1)
Patient related Characteristic							
Treatment duration >3yrs		68	42	75	47	1.2	(0.8-1.9)
Presence of comorbidity		51	32	53	33	1.1	(0.7-1.7)
duration of missing tablets >=7days		22	14	11	7	2.2	(1.0-4.6)
Knowledge related factors							
lack of knowledge on consuming medicines daily		1	1	1	1	1	(0.1-16.1)
Lack of knowledge on complication of hypertension		19	12	28	18	1.6	(0.8-2.9)
Lack of knowledge regarding need for treatment despite absence of any HT symptoms		24	15	20	12	1.2	(0.7-2.3)

We did a multivariate analysis, including variables with a statistically significant P valueof<0.05. After adjusting for age, duration of missing tablets being more than seven days was significantly associated with uncontrolled hypertension (OR 2.2; 95%CI 1.0 – 4.6)(Table:3)

We inquired the reasons for not taking tablets for patients who missed tablets for one or more days (n=149). Nearly one third missed their drugs due to work, and another one third forgot to take pills. Other reasons quoted by patients as reasons for missing drugs were being out of the station, lack

of help in reaching the health facility, distance, relative death, feel sick, due to other illness, drugs not prescribed if their blood pressure was under control, took Siddha medicine and drugs not working.(Fig.2).

Table 3: Multivariate analysis for factors associated with uncontrolled hypertension among the registered hypertension patients in public health facilities in Thanjavur district

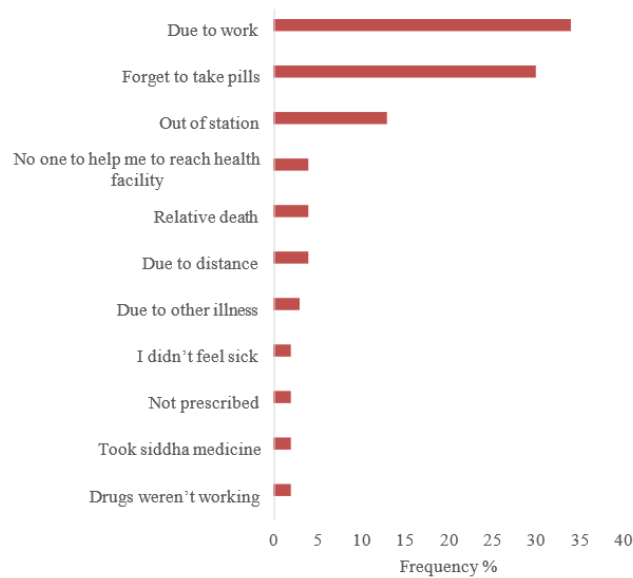| Characteristic	Crude OR	Adjusted OR	
		Estimate	95% CI
Duration of missing tablets >=7days	2.2	2.2	(1.0- 4.6)
Age	1	1	(0.976 -1.02)

Figure 2: Frequency of reasons for missing drugs among the hypertension patients who are missing drugs

DISCUSSION

In our study, an attempt has been made to find out the association between different risk factors with uncontrolled hypertension.

Tamil Nadu was the first state in the country to initiate state wide hypertension screening and management in the primary care facilities under Tamil Nadu Health Systems Projectin 2011. We documented the risk factors for uncontrolled hypertension in the primary care setting in Thanjavur, Tamil Nadu. Males and patients who missed medications for 7 or more days had higher odds of uncontrolled hypertension.

We observed high odds of poor control among males. Most of the studies have shown that females had hypertension under control than males.[8] A study done in Kaiser Permanente Southern California for identifying risk factors for uncontrolled hypertension shows that females had their blood pressure under control.[9] Another study done in Iran

reported higher odds of poor control among males [odds ratio (OR) = 2.31; 95 % confidence interval (CI) = 1.64-3.24].[10] In contrast, a large cohort study reported from Kaiser Permanente Southern California no association between gender and BP control (OR,0.99; 95% CI, 0.98-1.01).[11]

Despite increased awareness, poor adherence to treatment for chronic diseases remains a global problem. Uncontrolled systolic and diastolic blood pressure are important riskfactors for increased cerebrovascular events, cardiovascular events, and all-causemortality. Adherence issues are common in patients taking antihypertensive therapy and are associated with increased risk of coronary and cerebro vascular events. A hospital-based cross-sectional study was done in Ethiopia, in 2018 which showed that hypertensive patients who were non-adherent to antihypertensive medication had 2.062more risks of uncontrolled hypertension (adjusted odds ratio [AOR] = 2.062, 95%confidence interval[CI]:1.030–4.129).[12] A case-control study was done in similar settings at Harare central hospital; Zimbabwe reported low adherence to drugs was independently associated with uncontrolled blood pressure (adjusted odds ratio [AOR] =22.03, 95% confidence interval [CI]: 9.10–53.5).[13] A systematic review and meta-analysis for non-adherence to antihypertensive drugs, showed non-adherence to antihypertensive medications was higher among uncontrolled hypertension patients(83.7% [95% CI = 59.9–117.0]) than patients with blood pressure control (59.7% [95%CI = 37.7–81.7]).[14] Patients should be counselled regarding the need for takingmedications regularly and providers should take detailed history during clinic visits tounderstandthe patient's compliance to prescribed treatment. The knowledge regarding complications of hypertension and behavioural risk factors has been reported as one of the risk factors in various studies. However, it was not a riskfactor in our study. An institution-based cross-sectional study from Ethiopia in 2017, showed that participants who did not know at least two complications were more likely tohave uncontrolled hypertension than those who knew at least two complications(AOR=2.140, 95%CI=1.272–3.600, p=0.004).[15] Another study was done by Decoste et al. in similar settings, identified obesity, sedentary lifestyle and type2diabetesas risk factors for uncontrolled hypertension.[16]

LIMITATIONS

Our study was conducted in two primary health centres and thus may not be representative of all hypertensives. There might be recall bias since the risk factors and adherence were self-reported. Recall bias may have affected the results. So we reducedthe recall bias by high-quality questionnaire and

trained the interviewers well. Theresponse may be influenced if the doctor or nurse do the interview. Therefore patients were interviewed by the well-trained person not known to the patient.

CONCLUSION AND RECOMMENDATION

Lack of adherence to medications has been widely recognized as a critical issue inachieving blood-pressure control. In Tamil Nadu, all the public health facilities dispensing drugs for 30 days free of cost. Despite the availability of drugs, hypertension patients are not taking drugs regularly, and it is associated with lack of control. Patients didnot take medicines regularly due to other priorities or forgetfulness.

To improve their medication adherence, medical officers and staff nurses should emphasize patient counselling with more focus on males. Systems should be developed tomonitor adherence, such as phone call or SMS based reminders. Nurses should do pillcountduring clinic visitsto estimate compliance in the previous month.

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ORIGINAL ARTICLE - PUBLIC HEALTH

POST COVID SEQUELAE AMONG PEOPLE INFECTED WITH COVID-19 IN TAMIL NADU – A CROSS SECTIONAL STUDY

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Abstract

BACKGROUND : Tamil Nadu witnessed three pandemic peaks since the first COVID-19 case on March 7, 2020. Long-term effects, termed long COVID, persist with various symptoms and organ involvement. Despite the Indian government's guidelines, there's limited data on long COVID among survivors in India. This study was done to find the burden of post covid symptoms among individuals who tested positive for Covid-19 between March 2020 and February 2022 in Tamil Nadu, other than Chennai.

METHODS : A cross-sectional study in Tamil Nadu, excluding Chennai, was conducted among 1673 COVID-19 cases in June 2023 who were selected by stratified random sampling, stratified by age groups. Trained health staff gathered data using a semi-structured questionnaire, defining persistent post-COVID-19 symptoms as lasting more than 12 weeks. Data was entered in Excel and analysed using JASP software.

RESULTS : Among 1673 patients approached, 380 participants could not be contacted even after multiple attempts. Among the rest 1293 patients, seventy three patients(5.6%) were reported to have died. The overall prevalence of persistent post Covid symptoms was 21.3%(95% CI -19.04% - 23.72%). The most common symptom reported was loss of appetite and persistent fatigue. there is no significant association between gender, age group, pandemic wave, number of episodes of covid infection, covid vaccination and persistent post covid symptoms. However, hospitalisation, oxygen requirement, ventilatory support requirement, lung involvement and presence of any comorbidities was significantly associated with persistent post covid syndrome.

CONCLUSION : Targeted interventions for individuals with a history of severe COVID-19, pre-existing comorbidities, and specific post-COVID complications, healthcare systems can better support the holistic recovery and well-being of those affected by the long-term effects of the virus.

KEY WORDS : Long Covid, Post Covid, Persistent Post Covid Symptoms

INTRODUCTION

Tamil Nadu had the 1st case of Covid -19 on March 7th, 2020, ever since then there had been an increase in the number of cases with the state having witnessed 3 peaks of the pandemic in the year 2020 ,2021and 2022. There are evidences which states that Covid -19 does not end with acute infection, but continue to have long term effects affecting multiple organs. In a meta-analysis done by Leon's et al, reported more than 50 different long-term effects of Covid -19 with the time duration ranging from 14 to 110 days post viral infection. The meta-analysis reported that 80% of the infected people continued to have at least one effect even after 2 weeks of the infection. The 5 most common symptoms reported was fatigue, headache, attention deficit, hair loss and dyspnoea. But no studies from India was included in the meta-analysis.1 WHO had reported that the time duration how long the post covid 19 condition also called as long Covid or Long Haulers persist as non-predictable.[1] In a recent prospective study conducted in China reported that 55% of Covid -19 survivors had long Covid effects at the end of 2 years, though there was a persistent decrease in the symptoms over a period of time.[2] Long term effects of Covid

-19 are also referred as post COVID condition, long COVID, post COVID syndrome etc. While there is still a debate on defining post COVID-19 condition, WHO defines it as , 'an illness that occurs in people who have a history of probable or confirmed SARS-CoV-2 infection; usually three months from the onset of COVID-19, with symptoms and effects that last for at least two months. The symptoms and effects of post COVID-19 condition cannot be explained by an alternative diagnosis.'[6] The Ministry of Health & Family Welfare, Government of India (MOH&FW, GOI) defines post COVID syndrome as a condition characterised by signs and symptoms that develop during or after an infection consistent with COVID-19 which continue for more than 12 weeks and are not explained by alternative diagnosis.[3]

While the Government of India, had framed guidelines for management of post Covid sequelae, there are very scarce data available from Indian context to understand the burden

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of long Covid among Survivors of Covid -19.[3] A standing parliamentary committee headed by Lok Sabha member PP Chaudhury, has suggested the Union Government to take up studies on long term impact of Covid -19 in India.[4] This gives the sense of a dire need for estimating the burden of Long covid effects among survivors of Covid -19 post 2 years of infection. However, the long-term effect of the Covid-19 infection among the survivors has been studied in Tamil Nadu piecemeal. In a study done by ICMR among hospitalised patients with COVID-19 found that Dyspnoea, fatigue and mental health issues as the common post common conditions reported at the end of 1 year follow up and this also reported 4.3% death within 60 days post discharge. The study also compared the three waves of the pandemic and found that the post- discharge death before the first follow-up was highest among the patients admitted during the third wave of COVID-19.[5] This study was done only among hospitalised patients and did not have any information about non-hospitalised patients. In another study conducted to find the burden of post COVID_19 condition during the 12-14 post recovery period of COVID-19 in Chennai, Tamil Nadu, reported 24% to have post covid symptoms. However, this study was done only within 12-14 week recovery period and included only patients from Chennai.[6] To overcome these gaps, a cross-sectional study was conducted among patients who tested positive for Covid -19 between March 2020 – February 2022 to find the burden of post Covid-19 condition in Tamil Nadu other than Chennai.

METHODS

A cross sectional study covering population infected at different time interval after Covid infection from March 2020- 31st March, 2022 in Tamil Nadu other than Chennai was done. The study was conducted in the month of July 2023. Assuming 50% variability, and 95% confidence level and 5% absolute precision, the required sample size is 384. To get the result stratified across different time interval post Covid infection starting from 1 year to 3 years post covid irrespective of the severity of infection, the sample size was corrected. To account for non-response rate of 30%, the corrected sample size is 1492, which was rounded off to 1500. However, 1673 patients was included in the survey. In Tamil Nadu, RT-PCR was the only method of testing for diagnosing Covid -19. The line list of RT-PCR positive cases with their contact numbers is updated in the Directorate of Public Health & Preventive Medicine. The line list of all Covid -19 infection who tested positive from March 2020 – 31st March 2022 was obtained to form the sampling frame,

from which the required sample size was randomly selected by stratified random sampling method. The list was stratified into 5 different age groups, <30years, 31-45 years, 46-60 years, 61-75 years, >75 years. The necessary sample from each age group was obtained based on population proportion to size . All the selected individuals were contacted by the trained health staff of the respective district through phone using the contact details available. For those participants, who could not be contacted through phone, the field health workers attempted to visit them in person in the given address. Participants were explained about the purpose of study using a standard transcript which was read by the health staff and verbal consent obtained for participating in the study. Those who give consent were interviewed using a semi- structured questionnaire. Data collection was done by trained health staff who were trained adequately on the study protocol, obtaining consent, interviewing using the semi-structured questionnaire. Details regarding demographic profile , history related to Covid -19 infection and vaccination, co-morbidities and post Covid symptoms were obtained. The operational definition for persistent Post COVID-19 symptoms is the presence of clinical symptoms that developed during or after an infection consistent with COVID-19, persistent for more than 12 weeks. The list of post covid-19 symptoms were taken from the meta-analysis done by Leon et al which reported on the various long term effects.[7]The patients were grouped based on the date of their latest infection with respect to the three waves of the pandemic, considering first wave from the beginning of the pandemic until 1 February 2021, second wave from 2 February 2021 until 15 December 2021, and the third wave from 16 December 2021 to 31 March 2022.
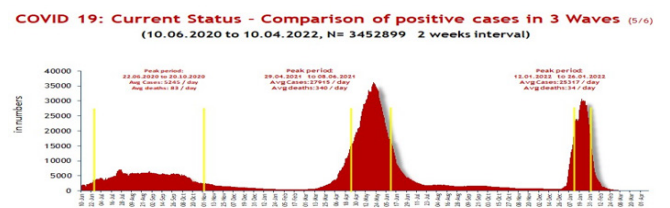
Figure 1. Covid Pandemic Waves in Tamil Nadu
Source: Office of Directorate of Public Health and Preventive Medicine

Symptoms are presented as frequency and proportions, while continuous data are presented as mean (SD) or median (IQR), as appropriate. The frequency of post COVID symptoms was also segregated by the three waves of the pandemic, corresponding to alpha, delta and omicron wave. Odds ratio (OR) with 95% confidence interval (95% CI) for the association between hospitalization, severity of infection , pandemic wave, vaccination and persistent symptoms. Data

analysis was carried out using JASP software.

RESULTS

Among 1673 patients approached, 380 participants could not be contacted even after multiple attempts. Among the rest 1293 patients, seventy three patients(5.6%) were reported to have died. The demographic profile of the deceased patients is given in table 4. The mean age of the study participants was 41.1 years (SD -17.2 years) with age ranging from 1 year to 90 years. Table 1 gives details about the demographic profile and Covid-19 infection of 1220 patients who responded to the survey. Larger proportion of the study participants reported infection in the 2nd wave and around 41% had hospitalization history. Around seven percentage of study participants reported to have repeated covid infection.

Table 1. Demographic and Covid -19 infection related details of the study participants(n- 1220)

Variable		Frequency	Proportion
Age Group	1-10	30	2.5%
	11-20	103	8.4%
	21-30	235	19.3%
	31-40	268	22.0%
	41-50	211	17.3%
	51-60	203	16.6%
	61-70	115	9.4%
	71-80	41	3.4%
	81-90	14	1.1%
Gender	Male	690	56.6%
	Female	530	43.4%
Education Status	Illiterate	130	10.7%
	1st -5th standard	131	10.7%
	6th -10th standard	267	21.9%
	Higher Secondary	215	17.6%
	Graduate	414	33.9%
	Post graduate	63	5.2%
Latest infection Pandemic Wave	1st wave	301	24.6%
	2nd wave	724	59.3%
	3rd wave	195	15.9%
No of episodes of Covid 19 infection	1	1134	93%
	>1	86	7%
Hospitalization for Covid -19		507	41.6%
Oxygen requirement		106	8.6%
Ventilatory support		18	1.4%
Lung involvement as radiological finding		213	17.5%
Covid -19 Vaccination with at least 1 dose		1056	86.6%
Single dose vaccination		72	5.9%
Two dose vaccination		786	64.4%
Booster dose vaccination		197	16.1%

Table 2 gives the comorbidity profile among study participants. The most common comorbidity prevalent among participants was diabetes and hypertension. With regards to arrythmia, cancer, cardiac failure and avascular necrosis of femur, more than 50% were reported after Covid-19 infection.

Table 2. Comorbidities among the study participants(n- 1220)

Comorbidities	Before Covid 19		Before Covid 19		Incidence After Covid 19		
	Frequency n=1220	Percent (%)	Frequency (n=1220)	Percent (%)	Frequency	N	Percent (%)
Diabetes Mellitus	189	15.5	158	13	31	1062	2.9
Hypertension	166	13.6	140	11.5	26	1080	2.4
COPD / Bronchial asthma	24	2	17	1.4	7	1203	0.6
Chronic Kidney Disease	14	1.1	11	0.9	3	1209	0.2
Dyslipidaemia	30	2.5	20	1.6	10	1200	0.8
Thyroid disorders	31	2.5	24	2	7	1196	0.6
Myocardial Infarction	28	2.3	17	1.4	11	1203	0.9
Cardiac Failure	6	0.5	2	0.2	4	1218	0.3
Arrythmia	10	0.8	5	0.4	5	1215	0.4
Stroke	14	1.1	8	0.7	6	1212	0.5
Avascular necrosis	8	0.7	1	0.1	7	1219	0.6
Cancer	23	1.9	10	0.8	13	1210	1.1
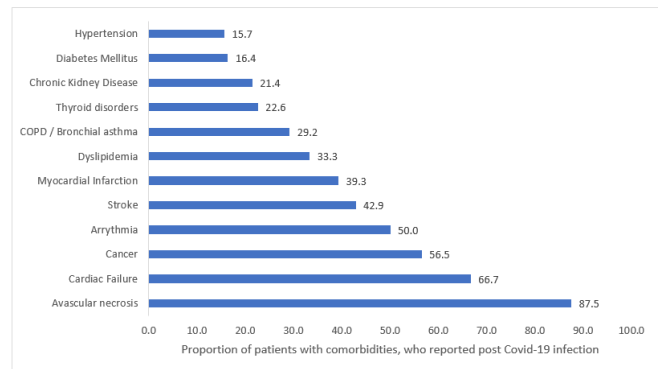
Figure 1: Among patients with comorbidities, proportion reported post Covid -19 infection

The overall prevalence of persistent post Covid symptoms was 21.3%(95% CI -19.04% - 23.72%). The most common symptom reported was loss of appetite and persistent fatigue.
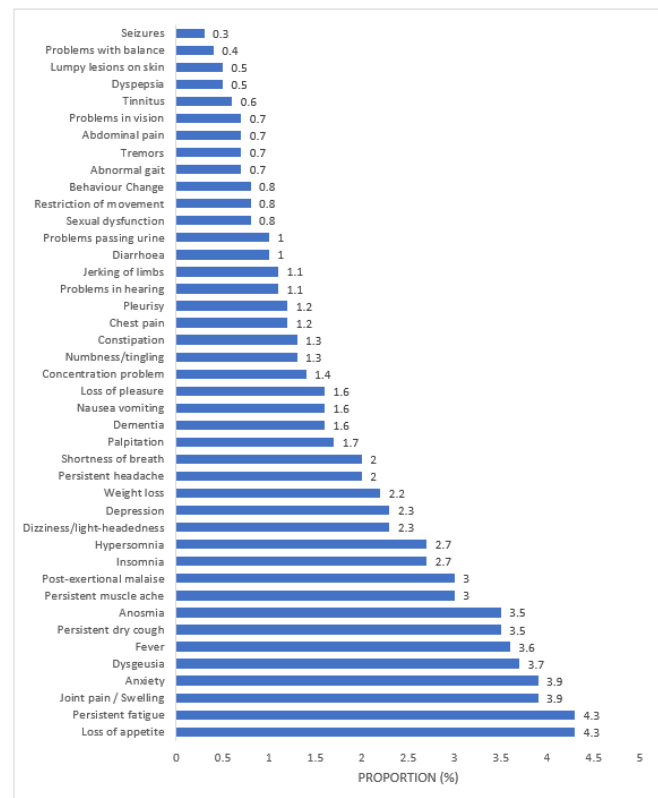
Figure 2: Post Covid Symptomology (N-1220)

Table 3 shows that there is no significant association between gender, age group, pandemic wave, number of episodes of covid infection, covid vaccination and persistent post covid symptoms. However, hospitalisation, oxygen requirement, ventilatory support requirement, lung involvement and presence of any comorbidities was significantly associated with persistent post covid syndrome.

Table 3. Prevalence of Post Covid -19 by demographic profile and Covid 19 infection

| Variable		Post-Covid-19 symptoms n (%)	OR (95% CI)	p-value
Gender	Male(n-690)	140(20.3%)	1.149(0.8731-1.5143)	0.320
	Female(n-530)	120(22.6%)		
Age group	<18 years	14(15.1%)	Not applicable	0.08
	18-45 years	121(18.8%)		
	46-60 years	76(24.2%)		
	>60 years	49(28.8%)		
Pandemic wave	1st wave	67 (22.25%)	Not applicable	0.750
	2nd wave	149 (20.58%)		
	3rd wave	44 (22.56%)		
No of episodes of Covid infection	One episode	238(20.9%)	1.294(0.781-2.144)	0.317
	More than 1 episode	22(25.5%)		
Hospitalisation	Yes	136(26.8%)	1.741(1.321- 2.294)	<0.001
	No	124(17.4%)		
Oxygen requirement	Yes	36 (33.9%)	2.043(1.332- 3.134)	<0.001
	No	224 (20.10%)		
Ventilatory support	Yes	8(44.4%)	3.015(1.178-7.720)	0.021
	No	252(20.9%)		
Lung Involvement	Yes	72(33.8%)	2.224(1.607-3.079)	<0.001
	No	188(18.6%)		
Covid Vaccination	Yes	224(21.2%)	0.957(0.642-1.425)	0.829
	No	36(21.9%)		
Presence of comorbidities before covid 19	Diabetes Mellitus	52(27.5%)	1.519(1.047-2.203)	0.024
	No diabetes	208(20.2%)		
	Hypertension	60(36.1%)	2.372(1.638-3.434)	<0.001
	No Hypertension	200(19%)		
	COPD / asthma	12(50%)	3.348(1.528-7.335)	<0.001
	No COPD/Asthma	248(20.7%)		
	CKD	9(64.3%)	10.33(3.647 –29.274)	<0.001
	No CKD	251(20.8%)		
	Dyslipidaemia	19(63.3%)	8.034(3.563-18.117)	<0.001
	No dyslipidaemia	241(20.3%)		
	Thyroid disorders	15(48.4%)	3.673(1.748-7.717)	<0.001
	Normal thyroid	245(20.6%)		
	Myocardial Infarction	18(64.3%)	12.078(4.741 -30.771)	<0.001
	No MI	242(20.3%)		
	Cardiac Failure	6(100%)	15.647(3.301-74.167)	<0.001
	No Cardiac Failure	254(20.9%)		
	Arrythmia	7(70%)	4.549(1.514-13.662)	0.006
	No Arrythmia	253(20.9%)		
	Stroke	10(71.4%)	6.815(1.978-23.475)	<0.001
	No Stroke	250(20.7%)		
	Avascular necrosis	8(100%)	13.792(2.846-66.82)	<0.001
	No AVN	252(20.8%)		
	Cancer	6(85.7%)	7.798(1.936-31.410)	0.003
	No Cancer	254(20.9%)		

Table 4. Age profile of deceased patients among the selected participants

Age group	survived	death	Age specific mortality rate (%)
01-10 years	30	0	0
11-20 years	103	1	0.9%
21-30	235	2	0.8%
31-40	268	2	0.7%
41-50	211	10	4.5%
51-60	203	18	8.1%
61-70	115	27	19.0%
71-80	41	11	21.1%
81-90	14	2	12.5

DISCUSSION

The findings of this study provide valuable insights into the prevalence and factors associated with persistent post-COVID symptoms, underscoring the need for comprehensive understanding and management of long-term COVID-19 effects. The documented prevalence rate of 21.3% highlights the significant impact of persistent post-COVID symptoms on a substantial portion of the affected population. These symptoms are present even after 1 year past the infection. In a study conducted by Kumar et al among those who required hospitalisation following Covid 19 infection in India,31% reported to have symptoms in the 30-60 day follow up period.[5] In another study done in Tamil Nadu, 24% reported persistent symptoms during the 12–14 weeks post recovery period of COVID-19.[6] In another cross sectional study conducted among health care workers with Covid-19 history, the prevalence of COVID sequelae was found to be 30.34% after 12–52 weeks of their discharge.[8] While these studies have looked at a shorter follow up time, in the current study the minimum duration since the last infection was 1 year and the maximum was 3 years. Hence, the prevalence of persistent Covid symptoms could be low compared to the other studies. However, one fifth of the patients still continuing to report at least one of the symptoms even after a long recovery period, indicates the long term effect of Covid -19.

Among the selected study participants, 5.6% was reported to have died. The age specific mortality rate was following the rates in general population.[9] In fact, there was no death reported among the vulnerable children age group between 1-10 years of age.

The most common symptom reported in this study was loss of appetite and persistent fatigue, followed by joint pain/swelling and anxiety. Fatigue was the most common symptom reported in other studies as well.[5,7,10] While the other studies have reported dyspnoea as one of the most commonly reported symptom, it was not the most common symptom in our study. The symptom wise prevalence ranged from 0.3% -4.3%, unlike other studies, where the individual symptoms prevalence was high. Kumar et al reported dyspnoea among 11.9% of patients at end of 100 day follow up.[5] Similarly in the meta-analysis by Leon et al, 58% was the prevalence of fatigue.[7] Fatigue is the most common symptom reported in 17.5–72% of post-COVID cases, followed by residual dyspnoea with an incidence ranging from 10–40%.

The most common comorbidity among the study participants was diabetes and hypertension. However, the concerning incidence rates of arrhythmia, cancer, cardiac failure, and avascular necrosis of the femur reported after COVID-19 infection underscore the wide-ranging and potentially severe complications associated with the virus. A review by Oronsky et al explores underlying mechanisms and possible manifestations of persistent post-COVID syndrome.[11] Among patients with Avascular Necrosis of Femur (AVN) 87.5% reported only after Covid -19 infection. AVN as a possible sequelae of Covid -19 is being reported as many case series and reports are published.[12,13,14,15] Patients with Covid 19 are facing the dual burden of the effect of steroid used as a therapy for Covid-19 and the hypercoagulable state induced by the infection itself, leading to increased risk of AVN.[12] Persistent hypercoagulable state following Covid infection and other factors like production of neutrophil extracellular traps, increased platelet activity,

impaired fibrinolysis and overall decreased anticoagulant function of the endothelium, explains the increased rate of MI and Stroke post covid.[11,16] These findings call for heightened vigilance and tailored follow-up care to monitor and address the increased risk of developing these specific health complications post-COVID-19, further emphasizing the necessity for integrated, multidisciplinary healthcare approaches to manage the diverse long-term sequelae of the disease.

On an attempt to find the factors determining the presence of persistent post covid symptoms, there was no significant difference based on gender. Gender was not a significant factor in other studies as well.[5,6] However, some studies state that female gender had an increased odds of reporting post covid symptoms.[8,17,18] While there was an increasing prevalence of long Covid with increasing age, it was not statistically significant. Advancing age was a significant factor associated with Long Covid in other studies.[5,6,18] There was also no significant difference in the prevalence based on the pandemic wave, whereas in the study by Kumar et al, specific symptoms like dyspnoea, fatigue, and mental health issues were common among those infected in the 2nd wave.[5] There was no difference in the prevalence based on the Covid Vaccination status or the number of episodes of covid infection. Covid vaccination was not increasing the risk of post covid as indicated in other studies.[8,19]

This study showed that patients who had severe Covid as presented as requiring hospitalisation, oxygen or ventilatory support and lung involvement had higher odds of the having COVID sequelae. Similarly, presence of any comorbidity increased the risk of post covid symptoms, emphasizing the critical role of the severity of the initial COVID-19 infection and pre-existing health conditions in influencing long-term health outcomes. This finding demonstrates a high degree of consistency on comparison with studies done in different research context.[6,8,10,18,20,21,22] This finding also highlights the need for targeted management strategies for individuals with these underlying health conditions to mitigate the potential exacerbation of post-COVID.

This study is done among all patients irrespective of their hospitalisation status and the follow up was after a long recovery period extending from 1- 3years post Covid infection. This study had also incorporated the new criterion of persistence of symptoms for at least 3 months as per MOHFW definition of long Covid. However, this study has certain limitations. This was a questionnaire based study and no investigations were carried out to rule out any specific diagnosis. This could impact the reliability of the Persistent post covid symptom estimate leading to both under and over estimate.

CONCLUSION

In light of these findings, healthcare professionals and policymakers should prioritize the development of comprehensive post-COVID care protocols that account for the multifaceted nature of persistent post-COVID symptoms and their associated risk factors. By incorporating targeted interventions for individuals with a history of severe COVID-19, pre-existing comorbidities, and specific post-COVID complications, healthcare systems can better support the holistic recovery and well-being of those affected by the long-term effects of the virus. Further research is crucial to unravel the underlying mechanisms driving the persistence of post-COVID symptoms and to inform evidence-based interventions that improve the quality of life for individuals navigating the aftermath of COVID-19.

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MISCELLANEOUS- PUBLIC HEALTH

RABIES ELIMINATION IN TAMIL NADU- WHERE WE STAND?

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Abstract

This article explores the strategies, challenges, and progress towards rabies elimination, focusing on Tamil Nadu. Despite a decline in rabies-related deaths, achieving the goal of zero deaths remains challenging. Strategies include ensuring timely post-exposure prophylaxis for humans, emphasizing vaccine availability and healthcare professional training. The animal component involves mass canine vaccination and birth control, with challenges in estimating stray dog populations and implementing systematic vaccination. Legislative frameworks related to rabies control are presented, emphasizing a One Health approach. Successful models from states like Goa and Sikkim illustrate the feasibility of elimination. The environmental component stresses effective solid waste management to reduce human-dog conflicts. This holistic approach, involving collaboration and urgency, is crucial for successfully combating rabies in Tamil Nadu.

KEY WORDS : Rabies Eliminiation

INTRODUCTION

Rabies is a vaccine preventable zoonotic viral disease which is highly fatal. Globally, 59000 deaths due to rabies is estimated to occur in 150 countries, with 95% of cases coming from Africa and Asia. 1India contributes to 1/3rd of these deaths.[2] All states/union territories are endemic for rabies except Andaman and Nicobar, and Lakshadweep Islands.[3] Although Rabies affects people of all age groups, children are the most vulnerable which constitutes 40% of people exposed to dog bites in Rabies-endemic areas.[2] Dogs are the major cause of human rabies death contributing to 99% of all rabies transmission to humans.[1] Countries are categorized as rabies free, controlled, and high risk depending on the rabies burden in domestic and wild animals. Some countries have achieved rabies elimination in both domestic and wild animals and are categorized as rabies free. There are certain countries which are categorized as rabies controlled, which still has rabies disease in the wild animals. India falls under high-risk category with high burden of rabies in domestic/ wild animals.

Rabies control in the country has a long history starting with the creation of Pasteur Institutes in India. Neural tissue vaccine was replaced by cell culture vaccine since National guidelines for rabies prophylaxis was to establish uniformity in pre and post exposure prophylaxis since 2002. Rabies was identified as a priority zoonotic disease by Planning Commission of India in 2007 following which a pilot Rabies control program was implemented by Ministry of Health And Family Welfare through National Centre for disease control. Madurai was one of the pilot cities. Based on the success of this program, National Rabies Control Program was upscaled in the 12th five year plan. Chennai was one among the two pilot cities wherein Animal component of Rabies control was piloted through Animal Welfare Board of India, under the Ministry of Environment, Forest and Climate Change. This was the first time, wherein there was a mention about animal vaccination, animal birth control etc. 3Globally, in 2015, the world has set a goal of "Zero deaths due to dog mediated rabies by 2030".[4] India, in alignment with this goal conceptualized "National Action Plan for dog mediated Rabies Elimination from India by 2030" (NAPRE) in the year 2018.[5] In this line the states are supposed to frame the State action plan in this regard.

WHO has divided countries into 5 different stages of elimination namely endemic stage, control stage, stage of zero human rabies death, elimination stage and maintenance stage. Rabies elimination is defined as interruption of rabies transmission among humans and no canine case.

Table.1. Animal Bites and rabies death in Tamil Nadu

Year	No of dog bites reported in Tamil Nadu	Death due to rabies
2023	639468	20
2022	883213	28
2021	819779	19
2020	714447	20
2019	755980	23
2018	598077	31

Source: Office of Directorate of Public Health and Preventive Medicine

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47

In Tamil Nadu, there were around 8.83 lakhs animal bites reported for the year 2022 and 121 deaths related to rabies from 2018 till 2022. The trend shows that Tamil Nadu is showing a declining trend in the deaths due to rabies, however, we are nowhere closer to the goal of zero deaths due to rabies. Tamil Nadu has committed itself to eliminate rabies. In this article, we will discuss regarding the various strategies that are adopted for achieving rabies elimination, challenges and the roadblocks ahead in implementing these strategies and the way ahead , with specific focus to Tamil Nadu.
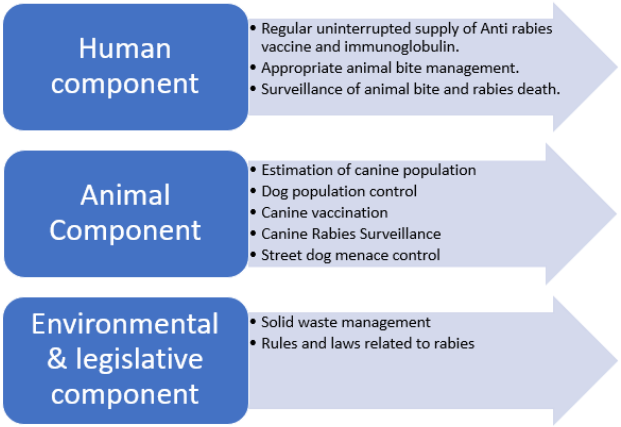

Figure 1: Interventions targeted at dog mediated rabies elimination

HUMAN COMPONENT

One of the key strategy for prevention of rabies among humans is post exposure prophylaxis with cost effective intra dermal anti-Rabies vaccine and anti-rabies immunoglobulin. Both are included in essential drug list at all levels.[6] Financial assistance to procure ARV and immunoglobulin is provided under state budget and by Government of India, under National Free Drugs initiative scheme.[5] Tamil Nadu has also issued state specific instructions to ensure that the ARV and immunoglobulin is administered to any animal bite victims based on the category of bites in any government hospitals irrespective of the time of arrival of the patient. This initiative enables the early initiation of animal bite management without requiring any delay in terms of referral for need for vaccine or immunoglobulin. Inventory management of these drugs are essential to avoid stock out. In Tamil Nadu, the Tamil Nadu Medical Service Corporation is monitoring the inventory through Drug distribution management system portal (DDMS portal) which enables remote monitoring of stock availability in all government hospitals. The state has also issued orders to ensure availability of minimum 20-30 doses of ARV and immunoglobulin availability at any point of time in the PHC. The other key component in animal bite management is availability of trained manpower. Rabies

prevention is one of the core competency in the preservice training of medical and nursing curriculum.

Despite all such efforts, evidences on compliance to animal bite management done in different parts of Tamil Nadu, have shown inadequacies in animal bite management. In a study done in Coimbatore, only half of the animal bite victims had received their 1st dose of ARV on the same day of animal bite. The most common reason quoted was the low risk perception by the victims and unavailability of vaccines in the hospitals.

Table 2: ARV stock position as on 23/11/23 in Tamil Nadu from DDMS portal

S.No.	District	Stock on Hand
1	ARIYALUR	1054
2	CHENGALPATTU	2838
3	COIMBATORE	5438
4	CUDDALORE	776
5	DHARMAPURI	3544
6	DINDIGUL	8429
7	ERODE	2476
8	KALLAKURICHI	1715
9	KANCHIPURAM	652
10	KANNIYAKUMARI	2699
11	KARUR	2962
12	KRISHNAGIRI	2865
13	MADURAI	1412
14	MAYILADUTHURAI	1512
15	NAGAPATTINAM	4036
16	NAMAKKAL	3332
17	NILGIRIS	2832
18	PERAMBALUR	3854
19	PUDUKKOTTAI	2964
20	RAMANATHAPURAM	3894
21	RANIPET	885
22	SALEM	3971
23	SIVAGANGAI	1746
24	TENKASI	2926
25	THANJAVUR	3509
26	THENI	450
27	THOOTHUKUDI	2346
28	TIRUCHIRAPPALLI	4266
29	TIRUNELVELI	3010
30	TIRUPATHUR	1541
31	TIRUPPUR	3676
32	TIRUVALLUR	3739
33	TIRUVANNAMALAI	4374
34	TIRUVARUR	1839
35	VELLORE	3664
36	VILUPPURAM	494
37	VIRUDHUNAGAR	5697
	Total	107417

The study also reported that there was mis categorisation of animal bites, with many category 3 bites being categorised as 1 or 2.[7] This discrepancy highlights the need for training of HCPs on the anti-rabies guidelines. This highlights the need for strengthening the implementation of the Animal bite management protocol and build in mechanisms to monitor the same. Undue efforts should be taken to create awareness among common people regarding rabies and animal bite management. The strategy on Information Education and communication (IEC) for increasing awareness about the diseases and the importance of seeking timely and appropriate treatment for animal bites, should be further strengthened. Role of multimedia in increasing awareness should be utilized.

Pre exposure prophylaxis for professionals exposed to an environment conducive for rabies virus transmission is also recommended. However, there exist no data on who

is getting pre-exposure prophylaxis and there is no mandate for providing proof of vaccination in any occupation. NAPRE recommends Indian Academy of Paediatrics to promote pre-exposure prophylaxis among children as part of routine immunization.

The other key intervention is a stronger surveillance for notifying animal bites and rabies incidence under Integrated Health Information Portal. There has been an inclining trend in the notification of animal bite cases over years. In the year 2008, the reported dog bites in Tamil Nadu was 300/100000 population.[8]
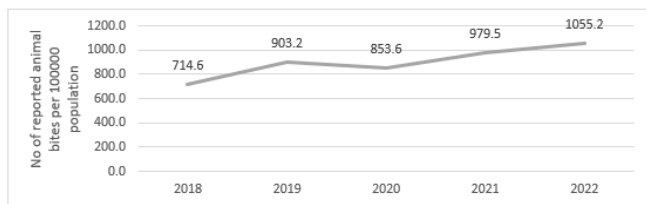

Figure 2: Reported dog bites per 100 000 population in Tamil Nadu, India, 2018–2023.

Source – Office of Directorate of Public Health and Preventive Medicine

There are variations within the districts in terms of reported animal bite, with Chengalpet, Cuddalore, Thanjavur, Tiruvallur, Salem reporting the highest numbers. However, the current surveillance mechanism is not robust especially with regards to animal bites, as not all private institutions notify in the IHIP portal.

To strengthen diagnostic capacity of Rabies, NAPRE recommends establishing of one laboratory at the district level to do anti rabies antibody titre. Among the 10 laboratories for diagnosis of human rabies, enlisted in NAPRE document, none is from Tamil Nadu. Currently the diagnosis of Rabies is based on clinical findings with history of animal bite. Hence there is a possibility that rabies is under-reported, mis- and under-diagnosed. With control programmes scaling up towards elimination of dog mediated rabies, surveillance is expected to increase leading to subsequent improved data quality.

ANIMAL COMPONENT

The guiding principle of the entire NAPRE document is its high reliance on ONE HEALTH approach, wherein it is strongly believed that human rabies elimination can happen only if canine rabies is addressed appropriately. Under animal component, the following interventions are recommended.

Estimation of canine population (number of free roaming dogs, community owned dogs and pet dogs)

is essential for calculating the logistics requirement for vaccinating these animals. The local body administration is vested with the responsibility of estimating the stray dog population. In Tamil Nadu, ad hoc surveys are conducted by local bodies to find an estimate of the stray dog population. Greater Chennai Corporation had the latest census in 2018 and reported to have 57,366 canines and it has projected the canine population to be between 90000 to 1,20,000, which is a gross underestimate as per the experts in the field. Stray dog population census should be undertaken every 4 year once.[9] Coimbatore corporation used geo-tagging technology to count the canine population and estimated to have 3.5lakh stray dogs. There is no public data available on the stray dog population census in other districts of Tamil Nadu.

Table 3: Intervention strategy for rabies control – animal component

Estimation of canine population	Local Body administration
Mass Canine Vaccination	Department of Animal Husbandry, Dairying
Dog population control	Department of Animal Husbandry, Dairying Local body administration
Canine Rabies surveillance	Department of Animal Husbandry, Dairying

Pet dog licensing is a legal mandate as per the Tamil Nadu Panchayats (Licensing of Dogs) Rules, 1999. However, only around 1% of the estimated pet-owning population in the city had obtained license for their pet dogs.[10] Most dog owners lack awareness of the requirement for a pet license. Obtaining a dog license involves certification by a veterinarian and ensuring that the dog receives the anti-rabies vaccine. Securing licenses, available for an annual fee of Rs 50, not only grants pet owners access to complimentary anti-rabies vaccination but also entitles them to free treatment at corporation clinics. In an effort to encourage more registrations, the Greater Chennai Corporation has opted to facilitate online registration.[11] However, in other places it is a cumbersome process. While the rule states that the pet owner is responsible for licensing the dogs, there is no punitive action taken on people who do not abide by the rule. Hence, the local body does not know the pet dog population estimate, which further hinders planning logistics for animal vaccination and birth control. Counting the canine population is a crucial step for prioritizing geographical areas for intensive intervention like mass dog vaccination and animal birth control.

CANINE VACCINATION

The canine population should be protected from rabies by providing them anti-rabies vaccination. According to

NAPRE, a minimum of 70% of the dog population should receive annual vaccinations for three consecutive years to establish sufficient protective herd immunity. Additionally, NAPRE recommends the implementation of sero-monitoring for the vaccinated dog population.To support these efforts, the Department of Animal Husbandry, Dairying, under the Ministry of Fisheries, Animal Husbandry, and Dairying, has introduced the "Assistance to States for Animal Diseases" scheme. This initiative aims to provide grant aids to states for activities such as animal anti-rabies vaccination, the establishment of state biological production centres, state diagnostic labs, and the capacity building of manpower in the field. Animal Welfare Board Of India (AWBI) has a separate scheme for supporting registered NGOs and civic bodies for mass dog vaccination.

Mass dog vaccination in Tamil Nadu is a weaker link in the Anti-rabies control program. Currently, vaccination is done for all dogs that come for sterilisation and based on dog menace complaints.9 There is a dire need for policy on implementation of mass dog vaccination strategy in Tamil Nadu. The other challenge with mass dog vaccination is ,the vaccine should be repeated annually for 3 consecutive years. Currently there is no mechanism in place to identify which dogs have been vaccinated especially among the free roaming dogs.

Certain successful models of mass dog vaccination have been tried in places like Goa and Nilgiris of Tamil Nadu. The One Health program of Goa consisted of three core areas of activity: dog vaccination; rabies education; and intensified human and animal rabies surveillance. A combination of door-to-door (DD) and capture-vaccinate-release (CVR) methods were used to access dogs for parenteral vaccination. DD vaccination involved teams walking house-to-house offering owners an opportunity to have their dog vaccinated, whilst CVR consisted of teams using nets to catch and vaccinate dogs that could not be restrained manually. Remote vaccination teams were spatially directed through assigned polygons displayed on a smartphone app, enabling managers to deliver vaccination resources to a specific geographic area at the sub-village scale. The GPS and details of each dog vaccination were recorded offline in the app.[12]

In Nilgiris, vaccination of dogs against rabies was implemented alongside other public sector field programs, accessing large numbers of dogs in rural settings without specialist dog-catching equipment. Canine rabies vaccination teams collaborated with a bi-annual bovine foot-and-mouth vaccination program coordinated by the Animal Husbandry Department (AH-collaboration) and with a village health program by the Public Health Department (PH-collaboration) in Nilgiris, Tamil Nadu, to vaccinate dogs during the implementation of these government-led health initiatives and achieved a vaccination coverage of >70%.[13]

ANIMAL BIRTH CONTROL

To limit the man -dog conflict and to reduce the stray dog population dog population control through Animal Birth Control should be done. NAPRE recommends states to establish a robust dog population management. AWBI also supports registered NGOs and Civic Bodies for stray dog sterilisation. As per the Animal Birth Control (Dogs) Rules', 2023, stray dogs should be picked up and sterilized and then returned to their locality. The right ear of the dog is clipped to indicate sterilization.[14] Currently the approach in Tamil Nadu is to ABC is based on complaint to sterilising stray dogs.

The ABC amendment in 2023 has laid down guidelines to standardise the ABC process and it requires all organisations to apply for a fresh registration and obtain a project recognition certificate.[14] Currently there are no animal welfare organisations that have permission from the Animal Welfare Board of India (AWBI) to engage in sterilisation, making it tougher for both the organisations and municipalities to do ABC.[15] The basic requirements to be fulfilled for any organisation to get the recognition certificate makes it cumbersome. This has led to lack of facility for performing ABC surgeries. The Tamil Nadu AWB, to tackle this issue, has decided to train veterinarians and dog catchers to help with the ABC.[15]

CANINE RABIES SURVEILLANCE

Rabies in animals is a notifiable disease and any animal suspected to have rabies should be confined and contained as per Prevention and Control of Infectious Disease Act, 2006. To strengthen rabies diagnostics in India, World Organization for Animal Health (OIE) had recognized the veterinary microbiology lab of KVAFSU , Hebbal, Bengaluru as the OIE rabies reference laboratory. Tamil Nadu Veterinary and Animal Sciences University in Chennai is one of the recognised laboratory for diagnosis of animal rabies.

ENVIRONMENTAL COMPONENT

Effective management of solid waste is crucial, as improper disposal of domestic garbage attracts stray dogs, leading to an escalation in their population and an increase in incidents of dog bites. Strategically controlling the environment to manage stray dog populations involves limiting access to food through proper disposal of food waste. In solid waste management (SWM), the following two activities are

essential:

- Identifying hotspots in the community where congregations of dogs are common.

- Raising awareness among communities about waste management and its connection to the increase in the dog population.

During the disposal of dead animal carcasses, it is imperative to adhere to regulations outlined in the Prevention and Control of Animal Disease Act 2009, Central Pollution Control Board Guidelines 2020, and Section 393 of the Indian Pen

Table 4: Legislations and public health laws related to Rabies control

S.no	Legislation	Implementation Agency
1	The Prevention & Control of Infectious and Contagious Diseases in Animals Act, 2009	Rabies is considered as a scheduled disease and any person who believes that the animal is to be infected by such a scheduled disease, should report to the Village officer, who in turn will report to the nearest available Veterinarian.
2	Municipality Act (which varies for different Civic Bodies)	- Registration and control of dogs - Destroy or confine animals suspected of rabies - No ferocious dog shall be allowed to be at large without being muzzled.
3	The Epidemic disease act, 1897, The Act No. 3 OF 18971	Prevention of spread of dangerous epidemic diseases
4	Prevention of Animal Cruelty Act-1960' and the 'Animal Birth Control (Dogs) Rules', 2023	Prescribes humane methodology for street dog population management, ensuring Rabies eradication, and reduction in man–dog conflicts.
5	The Clinical Establishments (Registration and Regulation) Act, 2010	hospital shall maintain health information and statistics in respect of national programmes, notifiable diseases and emergencies/ disasters/epidemics and furnish the same to the district authorities in the prescribed formats and frequency.

SUCCESSFUL MODELS FROM INDIA

States such as Goa and Sikkim have effectively implemented rabies control measures. The approach adopted by Goa16 has been outlined previously. Sikkim, on the other hand, implemented the Sikkim Anti-Rabies and Animal Health (SARAH) program in 2005. This state-wide initiative, which combines animal birth control (ABC) and anti-rabies (AR) efforts, has seen no human deaths from rabies since 2006-2015. SARAH is a collaborative project involving the Department of Animal Health, Livestock, Fishery & Veterinary Services (Government of Sikkim), the France-based NGO Foundation Brigitte Bardot (FBB), the Australia-based NGO Vets Beyond Borders (VBB), and the Sikkim Society for Prevention of Cruelty to Animals (SSPCA).The key components of the SARAH program include surgical

sterilization for dog population control, an annual mass anti-rabies vaccination program, provision of medical, surgical, and hospital care for sick and injured domestic animals and wildlife, animal welfare and rabies advocacy and training, introduction of legislation for human and animal rabies notification, compulsory registration and identification of pet dogs and cats, mandatory annual rabies vaccination for all dogs and cats, and rabies vaccination with permanent identification for dogs and cats brought into Sikkim.[16]

These successful models underscore the feasibility of achieving rabies elimination in Tamil Nadu as well

CONCLUSION

In conclusion, achieving the elimination of rabies in Tamil Nadu necessitates a concerted effort involving collaboration among various departments such as local body administration, animal husbandry, and health. The key to success lies in executing actions with a sense of urgency and on a mission mode. To move forward effectively:

- Prioritizing and advancing both the animal and human components simultaneously is essential for comprehensive rabies elimination efforts.

- Providing rigorous training to all stakeholders is imperative to ensure a well-informed and coordinated approach, emphasizing the importance of their roles in this mission.

- Involvement of multiple stakeholders, including support from non-governmental organizations (NGOs), is essential for a successful rabies elimination strategy.

Recognizing that dog-mediated rabies deaths are indicative of failures at multiple levels emphasizes the need for a holistic strategy addressing various aspects of rabies prevention and control. In essence, a strategic, collaborative, and mission-oriented approach, coupled with continuous training and awareness, is crucial for the successful elimination of rabies in Tamil Nadu.

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MISCELLANEOUS - PUBLIC HEALTH

100-100-100 INITIATIVE OF DIRECTORATE OF PUBLIC HEALTH

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Abstract

The "100-100-100" initiative, launched by the Directorate of Public Health and Preventive Medicine, stands as an ambitious effort to cultivate a research culture and harness existing data resources within the health system for informed policy decisions. This article explores the inception, execution, and challenges encountered during the implementation of the initiative. The outcome revealed that 50% of the submitted proposals were completed, with 4.8% published or under review and 45.1% presented at a workshop organized by the Directorate. The "100-100-100" initiative represents a significant leap in promoting research and evidence-based decision-making in public health.

KEY WORDS : "100-100-100" initiative, health research

INTRODUCTION

The "100-100-100" initiative launched by the Directorate of Public Health and Preventive Medicine is a commendable and ambitious endeavor aimed at fostering a research culture and utilizing existing data resources within the health system to inform policy decisions. Marking the centenary of the DPH, this initiative seeks to publish 100 research publications in just 100 days, that reflects a strong commitment to advancing public health. This article will delve into the conception of the 100-100-100 initiative, its execution, and the encountered challenges

CONCEPT OF 100-100-100 INITIATIVE

The 100-100-100 initiative called for the publication of 100 papers within 100 days, serving as a platform to connect research concepts with data resources and mentorship. A widespread invitation to participate was disseminated throughout Tamil Nadu. The initiative sought concept notes focusing on essential public health needs falling within the WHO's six building blocks of the health system. Interested individuals were invited to submit a concise one-page concept note outlining the research question, justification, methodology, and data sources. Additionally, applicants were required to provide proof of the feasibility of their proposed research for publication within 100 days, presented in the form of a Gantt Chart detailing the planned activities. The application process was open to individuals from any background, without restrictions based on their professional cadre, encouraging participation from various fields such as medical, paramedical, engineering, data analytics, economics, social welfare, and others.

PROFILE OF APPLICANTS

Around 104 applications were received following the announcement, and the details of these applications are presented in Table 1.

Table 1: Profile of the applications for the

Variable		Frequency (Percentage)
Type of institution	Government	100(97.0%)
	Private	3 (2.9%)
Type of institution based	Medical Colleges/ Universities/research institutes	30(28.8%)
	Directorate of Public Health and preventive Medicine	71(68.2%)
	Non-Medical Academic Institutions	3 (2.8%)
Domains	Reproductive health	27 (25.9%)
	Non communicable diseases	22 (21.1%)
	Communicable diseases	19 (18.2%)
	Health system	19 (18.2%)
	Child health	8 (7.6%)
	Mental health	6 (5.7%)
	Adolescent health	2 (1.9%)
	Geriatrics	1 (0.9%)
Source of data	Primary data collection	40(38.4%)
	Secondary data – open source	11(10.5%)
	Secondary data – to be obtained from Directorates	19(18.2%)
	Secondary data – locally available	34(32.6%)

MENTORSHIP

Mentors from esteemed academic and research institutions such as Madras Medical College, National Institute of Epidemiology, National Institute of Research in Tuberculosis, and JIPMER were extended invitations. Each faculty member

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willing to serve as a mentor was assigned a maximum of 2 research projects for guidance and support. Clear guidelines were established to govern the mentor-mentee relationship. In addition to a designated mentor, each research topic was linked with a program officer from the Directorate of Public Health and Preventive Medicine, tasked with facilitating the acquisition of secondary data from the directorate. Comprehensive instructions were provided to mentors and mentees regarding their respective timelines, the frequency of meetings and discussions, the specific nature of guidance to be offered by mentors and program officers, the responsibilities of the mentee, and the guidelines for authorship. A detailed activity timeline was also furnished.

ACTIVITY TIMELINE

OUTCOME OF THE INITIATIVE

Of the submitted proposals, 50% have been completed. Among these, 5 (4.8%) have been published or in review process in the journals, and 47 (45.1%) have been presented at the workshop organized by the Directorate.

Table 2: Outcome status of the proposals submitted at the end of the initiative

Variable		Completion status		
		Completed and Sent for Publication N-3 N(%)	Completed and Presented N-48 N(%)	Not completed N-53 N(%)
Type of institution - ownership	Government (n-98)	4(4%)	46(46%)	50(50%)
	Private (n-6)	1(33.3%)	1(33.3%)	1(33.3%)
Type of institution based on function	Medical Colleges/ Universities/research institutes (n-28)	3(10.0%)	17(56.7%)	10(28.5%)
	Directorate of Public Health and preventive Medicine (n-73)	2(2.8%)	30(42.2%)	39(54.9%)
	Non-Medical Academic Institutions (n-3)	0(0%)	0	3(100%)
Domains	Reproductive health (n-27)	1(3.7%)	11(40.7%)	15(55.5%)
	Non communicable diseases (n-22)	0	12(54.5%)	10(45.4%)
	Communicable diseases(n-19)	3(15.7%)	7(36.8%)	9(47.3%)
	Health system (n-19)	0	6(31.5%)	13(68.4%)
	Child health (n-8)	0	6(75%)	2(25%)
	Mental health (n-6)	1(16.6%)	2(33.3%)	0
	Adolescent health (n-2)	0	2(100%)	0
	Geriatrics (n-1)	0	1(100%)	0
Source of data	Primary data collection (n-40)	0	13(#2.5%)	27(67.5%)
	Secondary data – open source(n-11)	1(9.0%)	8(72.7%)	2(18.1%)
	Secondary data – to be obtained from Directorates (n-19)	2(10.5%)	7(36.8%)	10(52.6%)
	Secondary data – locally available (n-34)	2(5.8%)	19(55.8%)	13(38.2%)

DISCUSSION

Directorate of Public Health and Preventive Medicine's "100-100-100" initiative, reflects a commendable effort to promote research acumen and utilize the wealth of existing data within the health system for informed policy decision-making. The program's emphasis on bridging research ideas with available data resources and mentorship signifies a proactive approach toward fostering collaboration and knowledge sharing within the public health domain. The initiative implemented by the directorate has exhibited significant strengths and encountered notable challenges.

The widespread circulation of invitations across Tamil Nadu reflects an inclusive and open approach, welcoming participants from diverse backgrounds to contribute their expertise and perspectives to the initiative. This inclusive stance not only encourages a multi-disciplinary approach to research but also promotes a holistic understanding of public health challenges and solutions.

The focus on aligning research proposals with the World Health Organization's (WHO) six building blocks of the health system demonstrates a strategic approach to addressing critical public health needs. This not only ensures that the research is relevant and impactful but also aligns with global health priorities.

The requirement for a one-page concept note, which outlines the research question, justification, methodology, and data source, along with a Gantt Chart detailing the timeline for publication, ensures that applicants have a clear and feasible plan for their research. This level of detail and planning is crucial for the successful execution of the initiative.

By fostering a research culture among field staff, the initiative not only encourages a deeper understanding of data analysis but also instills a sense of curiosity and exploration. Moreover, by demystifying the research process, the program has made it more accessible and feasible for individuals with varying levels of expertise. Additionally, the provision of a platform that connects inexperienced researchers with seasoned academicians and experts serves as a crucial support system, promoting knowledge sharing and mentorship.

However, it is important to recognize that achieving the goal of publishing 100 research papers in 100 days is a formidable challenge. several challenges have emerged during the implementation of this initiative. It will require a robust infrastructure for data access, analysis, and publication, as well as strong mentorship and support for the participants. The difficulty in obtaining secondary data from the directorate has impeded the seamless execution of the research activities.

This issue has highlighted the importance of streamlining data retrieval processes within the organization. Furthermore, the limitations of remote mentorship have hindered the full realization of the potential benefits, emphasizing the need for a more robust and interactive mentorship model.

Despite these challenges, the initiative has made significant progress, achieving half of its intended objectives. Going forward, it is imperative to reinforce the concept of converting existing data into actionable insights and continue to build upon the foundation laid by this program. Addressing the identified bottleneck of acquiring secondary data from the directorate will be crucial for the future success of the initiative. To overcome this, the directorate should consider proactively sharing available data and encouraging researchers to propose analysis plans for the accessible data sets. Additionally, fostering a culture that promotes the utilization of locally available field data for research endeavours will contribute to the sustainability and growth of this initiative.

As far as we know, this initiative represents a pioneering effort in establishing a facilitating platform for the mass production of research. While the initiative has faced its fair share of challenges, its potential to empower staff with valuable research skills and leverage existing data for meaningful insights remains promising. By addressing the identified shortcomings and implementing strategic improvements, the directorate can continue to nurture a thriving research community within the organization, leading to enhanced data-driven decision-making and sustainable development.

CONCLUSION

Overall, the "100-100-100" initiative represents a significant leap in promoting research and evidence-based decision-making in public health. By bringing together a diverse group of participants and focusing on key public health needs, this initiative has the potential to yield valuable insights and contribute to the improvement of healthcare services and policies in Tamil Nadu. It serves as a noteworthy example of how data-driven research can drive positive change in the public health sector.

ORIGINAL ARTICLE - PUBLIC HEALTH

INITIAL IMPACT OF "FIRST 1000 DAYS OF LIFE" PROGRAMME IN 23 BLOCKS OF TAMIL NADU. AND PREVENTIVE MEDICINE

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Abstract

INTRODUCTION : The theme 'First 1000 Days of Life' begins with pregnancy planning and goes up to when the child reaches his/her second birthday. The major components for a healthy 1000 days' survival of a child includes adequate health care, nutrition, stimulation for early childhood development, quality childcare practices and a clean, safe environment which will have an influence in the future of a child. Eleven low performing districts in women and child health and nutritional status were selected by State Planning Commission namely Perambalur, Karur, Thiruchirapalli, Ariyalur, Sivagangai, Villupuram including Kallakuruchi, Pudukottai, Thiruvannamalai, Vellore (Integrated) and Thirunelveli and Tenkasi. 23 Blocks identified from the above districts were included for this program.

The conditional cash transfers in developing countries reduces poverty and increases consumption especially in a short term and this window can be used as an opportunity for improving health seeking behaviour, Prevention of Anemia and improved Weight gain of pregnant mother and early childhood up to 2 years.
1. Health seeking behaviour should be improved through health facilities by sensitizing the mother and her spouse, which in turn the quality of health services can be improved on demand creation,
2. The weight gain during the pregnancy,
3. Prevention and management of Pregnancy induced Anemia.

The Maternal Weight Gain should be 9-11 Kgs for an average Indian woman. The minimum weight gain should be 2 Kg at 18-20 weeks, 3+ kg in the 26-28 weeks and 4 kg in the 37-40 Weeks. If the mother gains weight of the said minimum level in the specified trimester, then only the cash benefit was awarded.

Regarding Anemia, a minimum haemoglobin concentration of 11 gm% is considered normal and because of increased fluid volume, mid-trimester dilutional anaemia is expected. Hence a minimum value of 10 gm% may be considered normal in the second trimester and 11 gm% is considered normal in third trimester.

First Incentive of Rs.1000/- at 18 – 20 weeks, Second Incentive – Rs.1000/- at 26 – 28 weeks, Third Incentive – Rs.1000/- at 37– 40 weeks, First incentive for Baby - Rs.500/- at 6th month, Second Incentive for the Baby Rs.500/- at 12th month, Third Incentive for the Baby Rs.500/- at 18th month, Fourth Incentive for the Baby Rs.500/- at 24th month.

AIM : To measure the initial impact of 'First 1000 Days of Life' program on health seeking behaviour, Prevention of Anemia, and Weight gain of pregnant mothers in 23 blocks of Tamil Nadu.

METHODS : A retrospective PICME secondary data-based study was conducted in 23 blocks of Tamil Nadu during October 2023.Data was collected from PICME data base by using state login ID comprised details of pregnant mothers registered, treated, and provided with cash benefits under 'First 1000 Days of Life' program from November 2022 to February 2023.

RESULTS : The baseline maternal health indicator - Early registration of pregnancy (within 12 weeks) was improved from 79 % during 1st instalment period to 86 % and 85 % during 2nd and 3rd instalment period respectively. Mothers getting eligibility of conditional cash transfer after receiving proper treatment for anemia and weight gain improved to 72 % during 1st instalment period, 66 % during 2nd instalment period and 58 % during 3rd instalment period comparing to their eligibility at their first visit to PHC 64 % during 1st instalment period, 64 % during 2nd instalment period and 51 % during 3rd instalment period.

CONCLUSION : Indicators revealing the health seeking behaviour of pregnant mothers such as mothers getting eligibility after proper treatment for underlying cause shows the impact of conditional cash transfer programme. These findings help us to generalize the activities to all the 388 blocks in the future.

KEY WORDS : : Conditional Cash transfer, Health seeking behaviour.

INTRODUCTION

The theme 'First 1000 Days of Life' begins with pregnancy planning and goes up to when the child reaches his/her second birthday. The major components for a healthy 1000 days' survival of a child includes adequate health care, nutrition, stimulation for early childhood development, quality childcare practices and a clean, safe environment which will have an influence in the future of a child. Eleven low performing districts in women and child health and nutritional status were selected by State Planning Commission namely Perambalur, Karur, Thiruchirapalli, Ariyalur, Sivagangai, Villupuram including Kallakuruchi, Pudukottai, Thiruvannamalai, Vellore (Integrated) and Thirunelveli and Tenkasi 23 Blocks identified from the above districts were included for this program.

The conditional cash transfers in developing countries reduces poverty and increases consumption especially in a short term[1] and this window can be used as an opportunity for improving health seeking behavior, Prevention of Anemia

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and improved Weight gain of pregnant mother and early childhood up to 2 years.

1. Health seeking behaviour should be improved through health facilities by sensitizing the mother and her spouse, which in turn the quality of health services can be improved on demand creation,

2. The weight gain during the pregnancy,

3. Prevention and management of Pregnancy induced anemia.

The Maternal Weight Gain should be 9-11 Kgs for an average Indian woman. The minimum weight gain should be 2 Kg at 18-20 weeks, 3+ kg in the 26-28 weeks and 4 kg in the 37-40 Weeks. If the mother gains weight of the said minimum level in the specified trimester, then only the cash benefit was awarded.

Regarding Anemia, a minimum hemoglobin concentration of 11 gm% is considered normal and because of increased fluid volume, mid-trimester dilutional anemia is expected. Hence a minimum value of 10 gm% may be considered normal in the second trimester and 11 gm% is considered normal in third trimester.

First Incentive of Rs.1000/- at 18 – 20 weeks, Second Incentive – Rs.1000/- at 26 – 28 weeks, Third Incentive – Rs.1000/- at 37– 40 weeks, First incentive for Baby - Rs.500/- at 6th month, Second Incentive for the Baby Rs.500/- at 12th month, Third Incentive for the Baby Rs.500/- at 18th month, Fourth Incentive for the Baby Rs.500/- at 24th month.

AIM

The present study aimed to measure the initial impact of 'First 1000 Days of Life' program in 23 blocks of Tamil Nadu.

METHODS

STUDY DESIGN: Descriptive study

SAMPLING TECHNIQUE: Non-Probability – Convenient sampling.

INCLUSION CRITERIA: All pregnant mothers registered, treated, and provided with cash benefits under 'First 1000 Days of Life' program from November 2022 to February 2023 in 23 blocks of Tamil Nadu.

DATA COLLECTION: A retrospective PICME secondary data-based study was conducted in 23 blocks of Tamil Nadu during December 2023. Data was collected from PICME database by using state login ID comprised details of pregnant mothers registered, treated, and provided with cash benefits under 'First 1000 Days of Life' program from November 2022 to February 2023.

OPERATIONAL DEFINITION: Exploring initial impact in two aspects: 1. Health seeking behaviour of pregnant mothers to get an institutional care by measuring percentage of mothers got eligible for cash benefit after proper institutional care. 2. Motivation given by the field functionaries to pregnant mothers to get quality health services using conditional cash transfer as a tool by measuring percentage of mothers registered early in pregnancy.

RESULTS

In the present study a total of 59,400 pregnant mother details were fetched from PICME database during November 2022 to February 2023. Out of them, 49,133 were registered early (within 12 weeks) by the VHN / UHN in PICME portal which was a baseline maternal health indicator. This indicator was improved from 79 % during 1st instalment period to 86 % and 85 % during 2nd and 3rd instalment period respectively. (Figure 1)
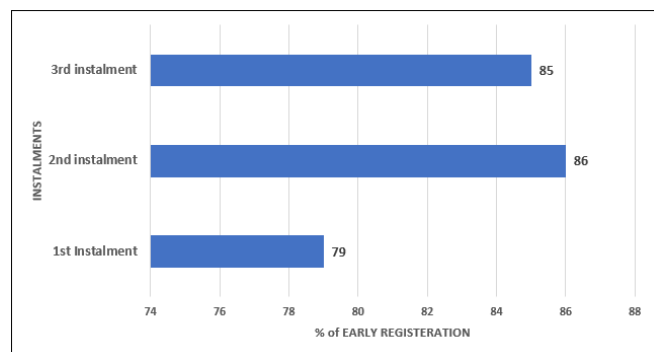

Figure 1: early registration of mothers (%)

Mothers getting eligibility of conditional cash transfer after receiving proper treatment for anemia and weight gain was improved to 72 % during 1st instalment period, 66 % during 2nd instalment period and 58 % during 3rd instalment period comparing to their eligibility at their first visit to PHC which was 64 % during 1st instalment period, 64 % during 2nd instalment period and 51 % during 3rd instalment period respectively. (Figure 2)
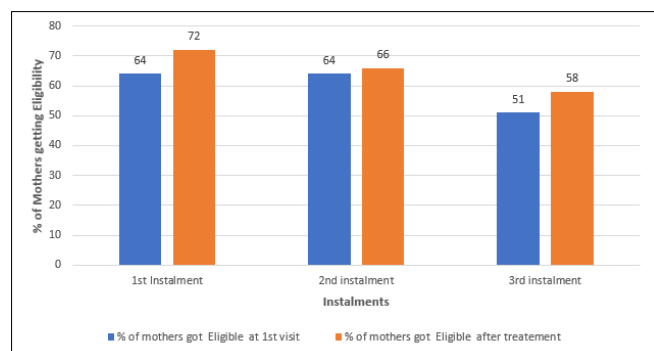

Figure 2: Eligibility for conditional cash transfer (%)
1st Visit vs After treatement

DISCUSSION

The antenatal mothers are given care and conditional cash benefit with kind benefit to reduce the out of pocket expenditure and to improve their nutritional status.[2] The present study aimed to measure the initial impact of 'First 1000 Days of Life' program in 23 blocks of Tamil Nadu one of such conditional cash benefit program. In the present study the baseline maternal health indicator - Early registration of pregnancy (within 12 weeks) was improved from 79 % during 1st instalment period to 86 % and 85 % during 2nd and 3rd instalment period respectively. This was due to intense knowledge poured by the field functionaries giving primary care to pregnant mothers by motivating them to get registered early (within 12 weeks) by VHN / UHN in PICME so that they can get conditional cash benefit. Similarly in a study done by Lakshmi et al in 2019 on Awareness regarding maternity benefit schemes among antenatal women in rural Tamil Nadu said that cash benefits indirectly helped to strengthen the primary health centers and first referral units to convert eligible mothers to enable institutional deliveries at a large scale.[3] In the present study mothers getting eligibility of conditional cash transfer after receiving proper treatment for anemia and weight gain was improved to 72 % during 1st instalment period, 66 % during 2nd instalment period and 58 % during 3rd instalment period comparing to their eligibility at their first visit to PHC which was 64 % during 1st instalment period, 64 % during 2nd instalment period and 51 % during 3rd instalment period respectively and this was similar to the findings of glassman et al that conditional cash benefit programs have increased antenatal visits, skilled attendance at birth, delivery at a health facility, and tetanus toxoid vaccination for mothers and reduced the incidence of low birthweight.[4] This can be due to the health seeking behavior of pregnant mothers to get quality health services so that they can improve weight gain during the pregnancy, prevent anemia.

CONCLUSION

Conditional cash transfer programs are increasingly being adopted and scaled in developing countries, particularly programs that target specific outcomes relating to maternal health, child health, and/or vaccination practices. This type of evaluation can help us understand linkages between transfers, conditionality, utilization, and outcomes. The result of this study reveals the improvement in the way of demand generation among pregnant mothers to seek proper institutional care. Indicators revealing the health seeking behaviour of pregnant mothers such as mothers getting eligibility after proper treatment for underlying cause shows the impact of conditional cash transfer programme. These findings help us to generalize the activities to all the 388 blocks in the future.

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A PROGRAMMATIC EXPERIENCE ON IMPLEMENTATION OF MULTIPLE STRATEGIES TO IMPROVE SCREENING OF HYPERTENSION AND DIABETES IN 28 HEALTH UNIT DISTRICTS OF TAMIL NADU NOVEMBER 2022 – MARCH 2023

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Abstract

ABSTRACT: In order to tackle NCDs, early detection and screening for the disease plays a vital role to initiate treatment at the earliest and ultimately reduce the premature mortality due to NCDs. In Tamil Nadu, a community-based NCD intervention program, Makkalai Thedi Maruthuvam (MTM) was launched in August 2021, an initiative taken to provide health care services at people's doorsteps, aimed to screening for NCDs as a measure of Population based screening and distributing medicines for patients suffering from NCDs in order to reduce their out-of-pocket expenditure. These services were delivered through Woman Health Volunteers (WHV), who were identified from the community with minimum qualification of higher secondary education. Even though the Tamil Nadu Public Health department has a broad base at field level, the screening coverage needs to be improved. So, as part of the Makkalai Thedi Maruthuvam program, the Department of Public Health & Preventive Medicine piloted multiple screening strategies on outreach mode to improve screening of HT & DM with focus to improve the coverage and quality of screening in selected districts. We proposed to do the secondary data analysis of the pilot data to analyse the effect of the strategies on coverage and quality and also to understand the feasibility of expanding the strategies on a wider scale. Proportions were calculated for screening coverage, positivity rate and detection rate. Our study resulted higher coverage among community-based strategy whereas higher positivity rate, follow-up confirmation and detection rate among screening strategies involving medical and para medical staff in the screening team. Conventional data collection tools were easier to implement whereas have challenges in follow-up monitoring. Newer digital tools which may be more effective than manual tools need additional resource mobilisation for implementation. In the 15 years of implementation of NCD intervention programme, MTM line list portal, the recent digital tool for the MTM program has created a better platform for tracking all the diagnosed NCD cases and ensuring their follow-up visits, compliance to drugs and adherence to treatment. The same plaform can also be expanded to capture the screening details thus aiding in assuring higher detection rate and decreased dropout rate of screened positives of NCDs.

KEYWORDS : Mass screening, Screening on outreach mode, screening coverage

INTRODUCTION

Noncommunicable diseases (NCDs) which are chronic in nature are due to a combination of genetic, physiological, environmental and behavioural factors. Most common NCDs are cardiovascular diseases, diabetes mellitus and cancers.[1] Currently there is an large estimate of around 50 % of population undiagnosed with Diabetes and Hypertension and of this population when diagnosed first nearly 20–30% already exhibit signs of microvascular and /or macrovascular complications.[2] According to WHO, NCDs disproportionately affect people in low- and middle-income countries, where more than three quarters of global NCD deaths (31.4 million) occur.[1] Modifiable risk factors such as Tobacco use, physical inactivity, the harmful use of alcohol and unhealthy diets raises the risk of dying from an NCD. Also, Metabolic risk factors contribute to four key metabolic changes that increase the risk of NCDs such as raised blood pressure, overweight/obesity, hyperglycaemia and hyperlipidaemia.[1] The long latency period of type 2

diabetes mellitus often several years, when the individual is often asymptomatic and unaware of their condition resulting in many health problems affecting the oral cavity, eye, wound healing, complications in pregnancy, heart and kidney disease and may result in death in certain cases.[3]

The Alma Ata Declaration in 1978 insisted on the need for Primary Health Care for effective screening prevention and management of NCDS which has again brought into spotlight with the 40-year anniversary of the Alma Ata Declaration reasserting its principles in the Astana Declaration, reinforcing the importance of PHC in achieving universal health coverage and the sustainable development

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goals, and on the prevention and management of NCDs.[4]

In India, increasing longevity, unhealthy diets and sedentary lifestyles have led to an increase in non-communicable disease (NCDs) such as heart disease, diabetes and cancers, which accounts for 64% of the disease burden in the country.[5] In order to tackle NCDs, early detection and screening for the disease plays a vital role to initiate treatment at the earliest and ultimately reduce the premature mortality due to NCDs. To combat diabetes, hypertension and other NCDs, the Government of India has launched "Population-based screening (PBS) of common NCDs" at the community and primary health care level. PBS provides promotive, preventive, curative and referral services as part of comprehensive primary health care at Health Subcentre - Health and Wellness Centres (HWCs) across the country. It provides equitable access for NCDs screening and management at the community level by utilizing the services of the health care workers and frontline workers under the existing primary healthcare system.[5]

In Tamil Nadu, a community-based NCD intervention program, Makkalai Thedi Maruthuvam (MTM) was launched in August 2021, an initiative taken to provide health care services at people's doorsteps, aimed to screening for NCDs as a measure of Population based screening and distributing medicines for patients suffering from NCDs in order to reduce their out-of-pocket expenditure. These services were delivered through Woman Health Volunteers (WHV), who were identified from the community with minimum qualification of higher secondary education. Even though the Tamil Nadu Public Health department has a broad base at field level, the screening coverage needs to be improved. A recent article on implementation of MTM program, various challenges were reported which included poor screening coverage by involving only a community-based health worker in screening of NCDs.[6] So, as part of the Makkalai Thedi Maruthuvam program, the Department of Public Health & Preventive Medicine piloted multiple screening strategies on outreach mode to improve screening of HT & DM with focus to improve the coverage and quality of screening in selected districts. We proposed to do the secondary data analysis of the pilot data to analyse the effect of the strategies on coverage and quality and also to understand the feasibility of expanding the strategies on a wider scale.

METHODS

The implementation of the screening strategies on outreach mode had been proposed in all the 46 HUDs in the state, randomly selecting one block in each of the HUDs for

a period of five months from November 2022 to March 2023. In each of the selected block, the target beneficiaries of the Makkalai Thedi Maruthuvam program aged 18 years above were included in the study.

Nine screening strategies were planned which includes the routine Population based screening by community level health care worker – Women Health Volunteers (WHVs). The other strategies include camp mode by the Primary Health Care team, camp by private hospitals, screening by Mid-level Health care Providers (MLHPs) at the Health Sub-centre level, screening by Mobile Medical Unit team, screening by NGOs with the support of Resident Welfare Association, screening at workplaces, all combined with the routine PBS by WHVs. Six ways of data collecting tools were proposed in the pilot. Based on the readiness and difficulties in establishing the data collection tool, only four strategies out of nine were piloted which covered 28 HUDs. The data from the piloted four strategies were analysed and the experiences in implementing were reported. The challenges and difficulties faced in establishing the data collection tools were also described.

Data were collected in an Excel sheet and analysed using epi info 7.2. Proportions were calculated based on the numbers screened, number followed up with further evaluation by medical and paramedical staff for confirmation of diseases and hypertension cases detected.

RESULTS

The nine strategies with the implemented four strategies denoted in alphabets, and with the data collection tool used were described in Table 1. The proposed six different data collection tools for the pilot study by the state were – NCD program Registers (manual), ODK tool with ABHA ID, existing Tamil Nadu Population Health Registry app, customized State NCD app called DPH THANKS app, CPHC-NCD app by Government of India, and a local district app. Of these six, ODK tool and the GoI CPHC-NCD app were could not be established. Hence four strategies proposed with ODK and one strategy with GoI NCD application as data collection tool couldn't be conducted and hence only four strategies were implemented for the pilot.

Four strategies - screening only by WHVs, screening by WHVs and special NCD camps, screening by WHVs and MLHPs and, screening by WHVs and camps in coordination with private empanelled hospitals were denoted as A, B, C, D respectively.

In 28 HUDs where four strategies had been implemented, the total target population is 34,21,126 and the population

screened were 7,27,057 with 21% as screening coverage. The routine PBS by WHVs had the highest screening coverage of 32.9% whereas the strategies involving special NCD camps had the least screening coverage of 10.4% and is shown in Table 2.

The screening positivity rate among the screened by the four strategies are given in Figure 1. Strategy by routine PBS by WHVs plus camps conducted by state insurance – Chief Minister's Comprehensive Health Insurance Scheme (CMCHIS) private empanelled hospitals showed the highest positivity rate and the conventional WHV screening strategy had the least positivity rate.

Table 1: Nine screening strategies and data collection tools to improve screening of Hypertension and Diabetes in 46 Health Unit Districts of Tamil Nadu, November 2022 – March 2023

S.No.	Denoted as	Screening Strategy	No. of HUDs selected	Data collection tool at community level for screening data
1	A	Routine Population Based Screening (PBS) by WHV only	8	Manual Registers: 1. Family Folder 2. Master Register 3. Referral slips 4. Line list Register
2	B	Routine Population Based Screening (PBS) by WHV and screening by Camp mode - Special NCD camps and VKT camps by PHC team	7	TNPHR app
3		Routine Population Based Screening (PBS) by WHV and screening by MMU (modifying their FTP)	7	Creating ABHA ID & ODK
4		Routine Population Based Screening (PBS) by WHV and screening by PHC team with the support of Resident Welfare Association (RWA) and NGOs	2	
5		Routine Population Based Screening (PBS) by WHV and screening by PHC team at identified workplaces (Workplace based intervention) with the support of labour department	3	
6		Routine Population Based Screening (PBS) by WHV, screening by Mid-level Health Provider (MLHP) and by Camps - special NCD camps and VKT camps	3	
7		Routine Population Based Screening (PBS) by WHV, screening by Mid-level Health Provider (MLHP) and by MMU by modifying their FTP	3	GoI NCD app
8	C	Routine Population Based Screening (PBS) by WHV and screening by Mid-level Health Provider (MLHP)	8	Google forms for screening data entry & DPH-THANKS app
9	D	Routine Population Based Screening (PBS) by WHV and screening by camps by CMCHIS empanelled private Hospitals in coordination with the PHC team	5	Customized NCD app

Table 2: Screening coverage by the four screening strategies for Hypertension and diabetes in 28 Health Unit Districts of Tamil Nadu, November 2022 – March 2023

Screening Strategy & Data collection tool	Total Population in selected HUDs	No. Screened	Screening coverage (%)
A. Routine PBS by WHVs	11,32,752	3,73,140	32.9
B. Routine PBS by WHVs + VKT camps + Spl. NCD camps	10,95,173	1,13,490	10.4
C. Routine PBS by WHVs + Screening by MLHPs	7,17,115	1,77,250	24.7
D. Routine PBS by WHVs + camps by state insurance empanelled private hospitals	5,06,086	63,177	12.5
Overall	**34,51,126**	**7,27,057**	**21**

Of those screened positive, the proportion confirmed by Medical Officer for hypertension and diabetes is 18.9% for routine PBS by WHVs (A), 36.7% for routine PBS by WHVs, VKT camps and Spl. NCD camps (B), 41.8% for routine PBS by WHVs and screening by MLHPs (C), and 30.9% for routine PBS by WHVs and camps by state insurance empanelled private hospitals (D) as shown in figure 3. Similarly, the detection rate for hypertension is found to be

0.9%, 3.7%, 6.7%, and 8.6% respectively for A, B, C and D as shown in figure 4. The highest detection rate was found with the strategy D involving routine PBS by WHVs and camps by state insurance empanelled private hospitals.

With regard to the establishment of data collection tools, it was easier to adopt the existing manual reporting system and the TN Population Health Registry app (TNPHR). With regard to the data collection tool – Google forms and DPH THANKS application, the google forms were piloted in the selected 8 HUDs whereas, the subsequent data collection tool proposed at facility level for capturing the follow-up data in a state customized app, the THANKS app, a new application was reported as could not developed due to time and resource constraints. A local customized application which was already in implementation was included for the pilot in Madurai HUD. The rest two tools – GoI CPHC NCD app and an ODK tool with ABHA ID which could not be implemented were reported as due to the technical difficulties.
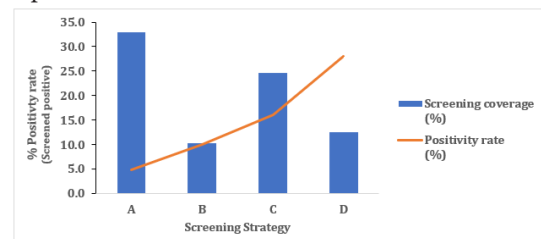

Figure 1: Positivity rate among multiple strategies to improve screening of Hypertension and Diabetes in 28 Health Unit Districts of Tamil Nadu November 2022 – March 2023
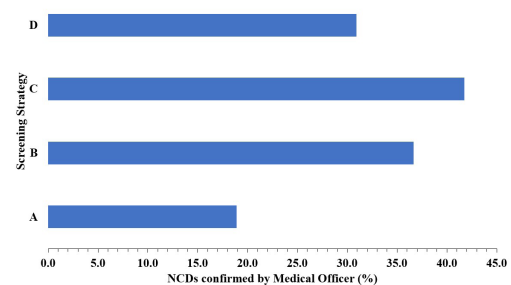

Figure 2 : Proportion of those screened positive confirmed by Medical Officer for NCDs in 28 Health Unit Districts of Tamil Nadu November 2022 – March 2023
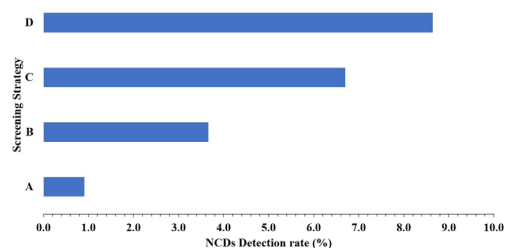

Figure 3 : Detection rate of NCDs among screened by strategies in 28 Health Unit Districts of Tamil Nadu November 2022 – March 2023

DISCUSSION

Piloting of the different screening strategies on Outreach mode is an appreciable attempt and need of the hour. Since NCDs are in the rising trend, awareness of the diseases alone can help to manage the burden. Screening of all target individuals are required. Tamil Nadu Public Health department have initiated this pilot to understand the impact and challenges in the implementation of the identified screening strategies on outreach mode.

High screening rate was found among the conventional PBS by WHVs during their house-house visit which is the active mode of screening and easily helps to reach the target beneficiaries at their household itself. Similarly, the screening coverage were higher among the screening by WHVs and MLHPs at Health subcentre level. Whereas the low screening rate found among screening by camp mode both by PHC team alone and by PHC team in co-ordination with state insurance empanelled private hospitals. Camp mode screening also requires comparatively mobilisation of existing resources and also additional resources at the community-level.

Positivity rate was found highest among those screened by WHVs and private empanelled hospitals and higher among those screened by WHVs and MLHPs, which shows screening by medical and paramedical showed higher positivity rate. The lowest positivity rate among WHVs again suggests that even though the field staff are trained and screening being carried out without at most care the quality of screening improves with a involvement of a medical and paramedical staff in the team.Similarly, the proportion of those screened positive confirmed to have hypertension or diabetes or both were higher in screening by camps and screening by WHVs and MLHPs and lowest among those screened by WHVs. This shows the difficulty in mobilising the beneficiaries from community to facility for conformation of diseases which is dependent on the awareness level of the community and also on the IEC, interpersonal communication with the beneficiaries by the health care staff.

Higher detection rate also found among those screened by WHVs and private hospitals and, by WHVs and MLHPs which again reiterates the importance of a medical or a paramedical staff in the team. Strategy by a community-level health care worker visiting house-house have shown higher screening coverage with lower detection rate. Whereas, the strategies involving medical and paramedical staff at camp mode and facility level have shown higher follow-up evaluation and detection rate. Hence this study emphasises that the health system should adopt all the screening strategies proposed in the pilot, as per the local needs and also involve the private hospitals and communities to improve the coverage and quality of screening and management of NCDs. This study also paves a way forward to assess the various data collection methodologies used by the Health Care Workers in improving the screening and management of NCDs.

The recent digital tool for capturing the details of the beneficiaries of the community-based Makkalai Thedi Maruthuvam Programme-MTM line list portal is found to be more effective in tracking the follow-up of all diagnosed hypertensive, diabetic and cancer patients under the programme. In the 15 years of implementation of NCD intervention programme, MTM line list portal has created a better platform for tracking all the diagnosed NCD cases and ensuring their follow-up visits, compliance to drugs and adherence to treatment. The same plaform can also be expanded to capture the screening details thus aiding in assuring higher detection rate and decreased dropout rate of screened positives of NCDs.

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CASE REPORT - PUBLIC HEALTH

APPLICATION OF SHORT-CONCENTRATION MODIFIED CONSTRAINT-INDUCED MOVEMENT THERAPY FOR INFANTILE HEMIPLEGIA WITH FUNCTIONAL ABILITY DIFFICULTIES: CASE STUDY

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Abstract

BACKGROUND OF THE STUDY : Infantile hemiplegia refers to brain injuries that occurs Prenatal or at Perinatal and lead to hemiplegia/ total paralysis of one side of the body, including the face, arm and leg. The main purpose of this article is to provide valuable information to Occupational therapist about the short concentration Movement therapy view point and treatment alternatives for patients with infantile hemiplegia.

OBJECTIVE : To assess the functionality of the affected upper limb in infant diagnosed with hemiplegia aged between 0 and 1 years after applying short-concentration modified Constraint-Induced Movement Therapy (mCIMT).

METHODS : Prospective case study. A M-CIMT protocol was applied for twelve weeks, with two hours of restraint per day. The study variables were quality of functional ability of the upper limb, recurrent use, participation of the affected upper limb in self-care and unstructured activities, active joint position, hand grasp–release action, hand grasp strength, supination and extension elbow movements. Four measurements were performed, using to measure the functional ability assessment based on Functional Status Score (FSS).

RESULTS : The subject was composed of infant with moderate manual functional ability. Statistically significant differences were detected in all the studied variables ($p < 0.021$), between the pre-treatment and post–treatment results (2–Weeks), except for upper limb dressing, putting on lower body dressing. In the 8-12 week, the changes were statistically extremely significant, except for protective extension, grasp strength, grasp–release and all functional variables (level of functionality and participation of the patient's upper limbs) in the FSS Evaluation $p < 0.0011$. The greatest increase occurred in spontaneous use from pre assessment to post Assessment ($p = 0.01$), reaching 88.87% active participation in bimanual sensory tasks. The quality of movement of the upper limb exhibited a significant value due to the increase in dissociated movements and hand grasp ($p = 0.01$).

CONCLUSION : A short-concentration (50 hours) of M-CIMT increased the functionality of infant diagnosed with hemiplegia between birth - 1 years of age with moderate manual ability.

KEY WORDS : Paediatric Occupational Therapy, Infantile Hemiplegia, functional Ability difficulties, Modified Constraint-Induced Movement Therapy

INTRODUCTION

Hemiplegia in infant is now recognised as an important cause of morbidity and mortality. There are essential developmental differences in hemiplegia in infant compared with adults who make the recognition and treatment of infant challenging. Hemiplegia in infant is relatively rare and frequently results in a lack of recognition and delay of diagnosis. The aetiologies of hemiplegia in infant are brain lesions, no single risk factor predominates. A wide variety of conditions predisposes to cerebral infarct or haemorrhage in infant and the underlying mechanism and cause in each individual can only be recognized with an informed and careful diagnostic approach. Increased awareness of hemiplegia will result in being brought to medical attention as rapidly as possible. With more rapid diagnosis, newer forms of thrombolytic and Neuro protective agents may

become future treatment options for these infants. Large multicentre collaborative intervention trials are necessary to determine the role of antithrombotic and other therapies in paediatric patients with hemiplegia. Although rare in infant the effects of hemiplegia have a significant impact on Childs development and lifelong burden of illness.

Thus, in directive to improve the affected upper limb "non-use", Modified Constraint-Induced Movement Therapy (M-CIMT) is used, which consists of constraining the healthy upper limb with a complete or partial containment

(Modified activities), thus promoting the use of the affected upper limb functional Ability difficulties in activities of daily living and self-care. The functional ability tasks integrate the repetition of the motor action with a variety of upper extremity activities. The use of M-CIMT has spread in recent years among paediatric occupational therapists, due to the large number of studies that support the effectiveness of this intervention compared to previous interventions that do not restrict the use of the healthy side. However, in its innovative conception, two premises had to be met: the restriction of the less-affected upper limb and the functional application of an intensive treatment applied in a structured way to the upper limbs. Different alternatives of M-CIMT have emerged over the years, under the term "Modified Constraint-Induced Movement Therapy" (M-CIMT). there are a variety of protocols used for CIMT, in which different repression systems are proposed.

In this line, one of the modifications widely used in paediatrics is the one based on M-CIMT, which obliges the healthy upper limb for less than 3 hours. Found that a fewer intensive (UE) Flexor Synergy recovering stages-based treatment (63 hours of treatment over 3weeks) produced similar benefits compared to a further intensive approach (126 hours of treatment over 3weeks). Functional abilities gains may be possible for some infant with a less intense program adjusted to 20 hours of occupational therapy in more than two consecutive weeks. According to Schweighofer et al., the reality of a "functional ability" would be necessary for the maintenance of functionality after occupational therapy, below which the use of the upper limb decreases while the benefits to the individual remain above such threshold. It would be useful to determine the specific doses of therapy in each patient. Consider assessing the functionality of ability the affected upper limb in infant diagnosed with infantile hemiplegia with moderate manual ability between birth and 1 years of age after applying low-intensity modified constraint-induced movement therapy (20 h) at individual educational programme. Many occupational therapists use a M-CIMT or another special treatment tool to help patients with the functional ability difficulties. When the activities are executed on a m-CIMT rather than done on a plinth, the hand muscles may be activated more effectively as a patient's function is perturbed when a self-care beneath them, and the muscles respond in instruction to help the patient maintain the ideal hand function. Due to the clinical symptoms found in infantile hemiplegia, there is an impairment in activities of daily living, which further affects the quality of life of the infant. So far, paediatric therapy has been beneficial. It is necessary to preserve the hand functional ability difficulties and self-care activity.

CASE HISTORY :

As narrated by parents, the one-year-old male master was apparently one month back. Then, he suddenly develops focal seizure, which was relieved by consultation and medication given by their family doctor. The episodes of sudden fever continued two to three times weekly. But later, the child experienced a high-grade temperature; the parents immediately rushed he to a nearby government hospital, where he was admitted to the general ward for two days. On the second day, he experienced his first episode of convulsions and was referred to a private hospital in their local place, and he was urgently admitted to the intensive care unit. Investigations like MRI was done, and the child was diagnosed with infantile hemiplegia. During the period of stay in the PICU, the child developed a few episodes of seizure for which medications were given and brought under controller. It further leads to loss of right-side upper limb weakness, and right lower limb weakness. After a stay of 30 days in the PICU, the child was shifted to the general ward. As the child's condition was deteriorating and there was availability physical therapy, a lack of availability for occupational therapy treatment, The child was referred to Magil milestone therapy centre for further treatment. The child was referred for Paediatric occupational therapy for further management on the 15th of March 2022. After master receiving Paediatric occupational therapy 6 days a week /3month, (February-April-2022) each session lasted 45 to 50 minutes; therapy was planned in such a way to feed his Flexor Synergy recovering stages, and to improve his muscle tone, self-care and functional abilities. Based on the assessment report and a detailed discussion with medical history from the parent, the following goals were included in the therapeutic intervention program. Therapy was playing based with unstructured to structured activities and included Sensory Integration and Modified Constraint-Induced Movement Therapy. His family members were invited to actively participate in sessions and home program was provided to his family on a regular basis to encourage continuity at home.

METHODOLOGY :

This is a case study, Before initiating the study, a well-versed consent form was given mother to the infant family to participate, which definite the right to withdraw from the study at any time, if required by the participant.The

inclusion criteria were a medical diagnosis of right infantile hemiplegia, age between birth and 1 years, lack of activity of the affected upper limb, ability to exceed 10° extension in the metacarpophalangeal and interphalangeal joint, ability to comprehensive a 20° extension of the wrist of the affected upper limb, adequate intellectual development to understand the non-verbal orders given for the execution of tasks and cooperation in their performance. In the same way, the exclusion criteria were visual problem that prevented the specific from carrying out the intervention.

Treatment plan decided was to (GAS) Goal attainment scale performance pre and post intervention followed by Short concentration Movement therapy application, also along with extraction of retained primary self care management followed by Weefim 7 point rating follow scale. Upper extremity each major joints component should assess Muscle tone by Modified aswarth scale (MAS).Upper extremity sensory component, General, Avoiding avoider, Sensory seeking, Registration by stander, component assess by sensory profile tool. FSS scale component assess Posture, alignment, self care, Function ability by Functional status score. And also following brun storm UE recovery stages pre and post intervention assess Upper extremity. These scales component pre and post intervention statistically analysed.

PAEDIATRIC OCCUPATIONAL THERAPY INTERVENTION

Figure 1 : The Occupational Therapy intervention protocol is depicted in follows Figures

Problem identified	Goal	Treatment strategy	Intervention
Functional ability	To integrative tone in postural alignment	NDT	Scapula mobilization
			Weight bearing activities
			Trunk rotation
			Bed mobility
Head/neck control	To enhance head and neck control	Facilitatory approaches and vestibular stimulation	Swing activities
			Head control in prone activities with a wedge
			Full body extension and supine lateral rolls with flat swing
			Chair swing activities
Sensation	To integrative sensation	Multisensory strategy	Tactile activities
			Proprioceptive activities
			Vestibular activities
Oro motor	a strength of grade	Oro-motor rehabilitation	Oro-motor muscular retraining
Hand function- Flexor Synergy	Hand functional activities	Constraint-Induced Movement Therapy	Affected side-involving activities maximum as per movement therapy protocol

OUTCOME MEASURE

Table 1: Characteristic of data pre-post-evaluation- Modified Ashworth scale (MAS)

Characteristic of data-Unpaired t-test	pre-test Intervention (MAS)	post-test intervention (MAS)
Mean	16.67	84.83
standard deviation	7.76	26.90
standard error (SE) means	3.17	10.98
95% confidence interval difference	98.35	37.98

Table 1; data shows (MAS) pre-post-test evaluation scores of all scale components of subject, mean values are 16.67 and 84.83, respectively standard deviation 7.76 and 26.90 respectively sample size, standard error of mean 1.34 and 1.24, the mean of pre and Post intervention 95% 01confidence interval of this difference 3.17 and 10.98, respectively.

Table 2 : 't' test between characteristics of data pre-post-evaluation- Modified Ashworth scale (MAS)

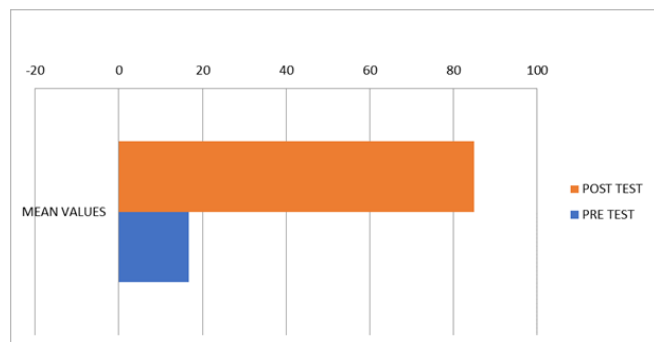| S. No.		Variable 1	Variable 2	P value	T value	Level of Significance
2		pre-test intervention	post-test intervention	0.0021	5.8050	Very statistically Significant

Figure 1 : Mean of Pre control and pre-experimental groups of evaluation - Modified Ashworth scale (MAS)

Table 3: Characteristic of data pre-post-evaluation- FSS

Characteristic of data-Unpaired t-test	pre-test intervention (FSS)	post-test intervention (FSS)
Mean	5.40	10.00
standard deviation	2.07	0.00
standard error (SE) means	0.93	0.00
95% confidence interval difference	6.74	2.46

Table 3 : data shows (FSS) pre-post-test evaluation scores of all scale components of subject, mean values are5.40. and 10.00, respectively standard deviation 2.07 and 0.00 respectively sample size, standard error of mean 0.93 and 0.00, the mean of pre and post intervention 95% 01confidence interval of this difference 6.74 and 2.46, respectively.

Table 4: 't' test between characteristics of data pre-post-evaluation- Functional status score (FSS)

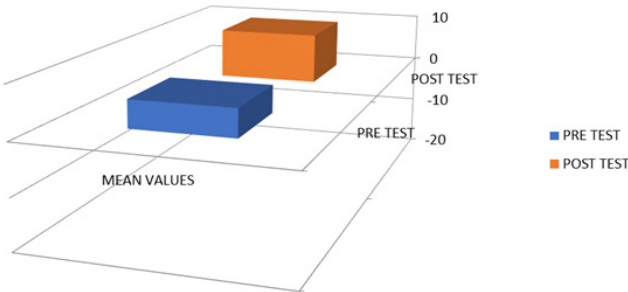| S. No.		Variable 1	Variable 2	P value	t value	Level of Significance
3		pre-test intervention	post-test intervention	0.0011	4.9603	Very statistically Significant

Figure 1: Mean of characteristics of data pre-post-evaluation- Functional status score (FSS)

Table 5: Characteristic of data pre-post-evaluation- Sensory profile (SP-2)

Characteristic of data-Unpaired t-test	pre-test intervention (SP-2)	post-test intervention n (SP-2)
Mean	20.31	57.54
standard deviation	13.26	8.49
standard error (SE) means	3.68	2.36
95% confidence interval difference	47.65	26.81

Table 5; data shows (SP-2) pre-post-test evaluation scores of all scale components of subject mean values are 20.31 and 57.54, respectively standard deviation 13.26 and 8.49 respectively sample size, standard error of mean 3.68 and 2.36, the mean of pre and post intervention 95% 01confidence interval of this difference 47.65 and 26.81, respectively.

Table 6: 't' test between characteristics of data pre-post-evaluation- Sensory profile (SP-2)

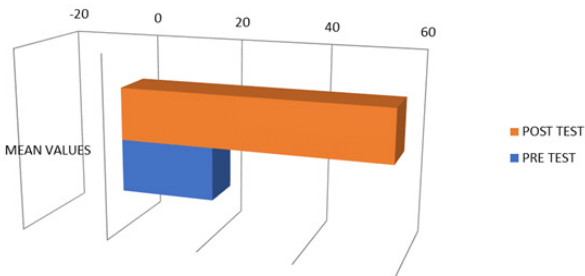| S. No.		Variable 1	Variable 2	P value	t value	Level of Significance
6		pre-test Intervention	post-test intervention	0.0001	7.7845	Very statistically Significant

Figure 1: Mean of Pre control and pre-experimental groups of evaluation -Sensory profile (SP-2)

DISCUSSION

The purpose of the study is to determine the Application of short-concentration Modified Constraint-Induced Movement Therapy for Infant with Infantile Hemiplegia with functional Ability difficulties The deterioration of functional difficulties causes a weakness present in the execution of activities of daily living in infant with hemiplegia. Treatment plan decided was to (GAS) Goal attainment scale performance pre and post intervention followed by Short concentration Movement therapy application, also along with extraction of retained primary self care management followed by Weefim 7 point rating scale.Data shows (MAS) pre-post-test intervention scores of all mono subject, mean values are 16.67 and 84.83, respectively standard deviation 7.76 and 26.90 respectively sample scale components standard error of mean 1.34 and 1.24, the mean of pre and post intervention 95% confidence interval of this difference 3.17 and 10.98, respectively.

These results are supported by Chen Y.P., Pope S., Tyler D., Warren G.L. Effectiveness of constraint-induced movement therapy on upper-extremity function in children with cerebral palsy: A systematic review and meta-analysis of randomized controlled trials. Case study obtained significant changes in the functional activities of daily life assessed, excluding in dressing the upper limbs, putting on splints and buttoning buttons. This could suggest the need for improvements in visuomotor coordination and bimanual coordination, and greater strength and precision in the affected grasp to support objects and to perform the activities, which require great ability in the affected upper limb.

Data shows (FSS) pre-post-test intervention scores of all scale components subject, mean values are5.40. and 10.00, respectively standard deviation 2.07 and 0.00 respectively single sample size, standard error of mean 0.93 and 0.00, the mean of pre and post intervention 95% confidence interval of this difference 6.74 and 2.46, respectively. These results are supported by Rostami H.R., Arastoo A.A., Nejad S.J., Mahany M.K., Malamiri R.A., Goharpey S. Effects of modified constraint-induced movement therapy in virtual environment on upper-limb function in children with spastic hemiparetic cerebral palsy: A randomised controlled trial.

The advantage of combining a short-concentration Modified Constraint-Induced Movement Therapy of treatment with the occupational of therapy in the infant own home is that this modification is better accepted by both parents and the infant, as reported by authors such as , who showed better rates of parental competence among those who had applied low doses of treatment.

Data shows (SP-2) pre-post-test intervention scores of all scale components subject, mean values are 20.31 and 57.54, respectively standard deviation 13.26 and 8.49 respectively single sample size, standard error of mean 3.68 and 2.36, the mean of pre and post intervention 95% confidence interval of this difference 47.65 and 26.81, respectively. The objective of study supported Eliasson A.C., Krumlinde-Sundholm L., Gordon A.M., Feys H., Klingler K., Aarts P.B.M., Rameckers E., Autti-Rämö I., Hoare B. Guidelines for future research in constraint-induced movement therapy for children with unilateral cerebral palsy: An expert consensus. Dev. Med. Child Neurol. 2014;56:125–137. doi: 10.1111/dmcn.12273.

Likewise, some infant showed higher levels of frustration or low tolerance was shown by both the infant and the family members with higher doses of treatment. To minimize such feelings, some authors have proposed adapting the original protocol, suggesting the use of the repression only during the intervention period, reducing the dose and using a protocol that is "infant friendly" and enhances infant engagement. Thus, our proposal could positively affect these aspects.

CONCLUSION

Application of short-concentration Modified Constraint-Induced Movement Therapy for Infant with Infantile Hemiplegia with functional Ability difficulties and its role in enhancing participation and improving functional ability of self-care and also to facilitate infant upper extremities performance and Modified Constraint-Induced Movement Therapy Day to day function meaningfully. The short-concentration Modified Constraint-Induced Movement Therapy focuses on the child's goal setting and hand function, thereby enhancing un structure and promoting flexor synergy pattern wise recovery. Movement Therapy analysis includes an understanding of the landscape task, Internal and external factors contexts that both facilitate and independent performance.

LIMITATIONS OF THE STUDY

This case study has several limitations. First, given the broad scope of the study and the amount of literature within each diagnostic category, it was possible to provide only a general synthesis of the overall effect of mCIMT intervention types. We were not able to include detailed metaphors of case study for direct comparison; however, descriptions of the interventions and characteristics are provided in Supplemental Table 1,2,3,4,5,6 for orientation and comparison. we were unable to teach out the effects of variations in activities and specific characteristics of individual interventions (e.g., type

of activities, settings for physical modalities). The issue with collection of interventions was frequently noted in the other case study included in this fusion, indicating a need for more thought in the design of future rehabilitation research studies.

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Manuscripts submitted at our website **www.tnjphmr.com** will be reviewed for possible publication with the understanding that they are being submitted to one journal at a time and have not been published earlier or under simultaneous consideration for publication by any other journal. Upload the text of the manuscript, tables and individual figures as separate files. All manuscripts submitted will be duly acknowledged, however the journal will no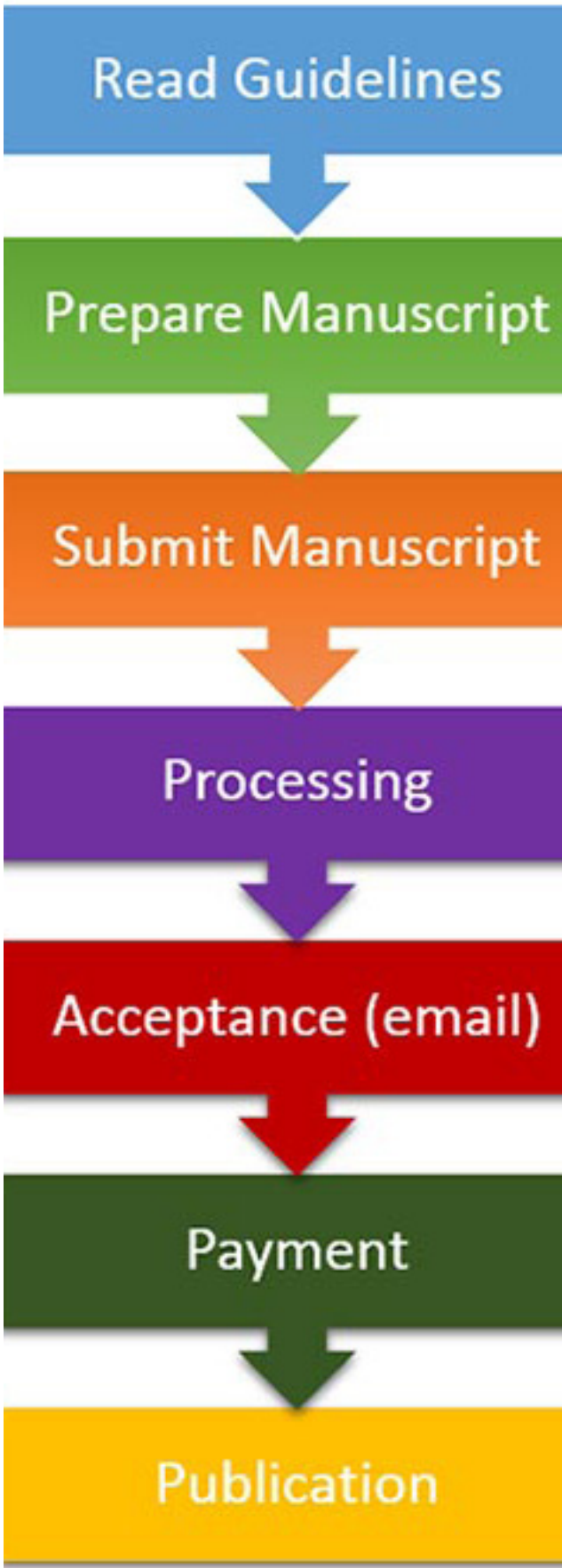t return the unaccepted manuscripts. Each manuscript received will be assigned a manuscript number, which must be used for future correspondence. All articles (including invited ones) will be usually evaluated by peer reviewers who remain anonymous. The authors will be informed about the reviewers' comments and acceptance/rejection of the manuscript. Accepted articles would be edited to the Journal's style. Proofs will be sent to the corresponding author which has to be returned within one week. Accepted manuscripts become the permanent property of the Journal and may not be reproduced, in whole or in part, without the written permission of the editor.

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