UNDERSTANDING DIMENSIONS OF RESILIENCE IN NON-COMMUNICABLE

DISEASES (NCD) MANAGEMENT AMONG PEOPLE LIVING IN FLOOD PRONE

AREA OF ALAPPUZHA DISTRICT, KERALA

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Dissertation submitted in partial fulfillment of the requirements for the award of the degree of

Master of Public Health

ACHUTHA MENON CENTRE FOR HEALTH SCIENCE STUDIES

SREE CHITRA TIRUNAL INSTITUTE FOR MEDICAL SCIENCES AND TECHNOLOGY

Thiruvananthapuram, Kerala. India – 695011

AUGUST 2023

ACKNOWLEDGEMENT

The evolution of thesis work has been inspiring, challenging and was a great experience. It has been made possible by the constant support of many people. I would like to express my sincere gratitude to my beloved guide Dr. Rakhal Gaitonde Professor, for his consistent support and motivation, who stood by me throughout. His constant encouragement, support, and invaluable suggestions made this work to a great success. He has been everything that one could want in an advisor. I would always remember the thought-provoking discussions.

I thank Dr. Jeemon P, Dr. Ravi Prasad Varma for their most valuable intervention in this journey. I also thank Dr. Mala Ramanathan, Dr Biju Soman, Dr. Jissa V T, Dr. Sankara Sarma, Dr. Kannan Srinivasan, Dr Manju and Dr Srikant A for their valuable inputs and suggestions.

My sincere thanks to my colleagues for their love and support.

I also wish to express my sincere gratitude to the wonderful ASHAs who had taken great effort in assisting me during the data collection, also the participants for their valuable responses and willingness to take time off from their routines.

Lastly, I would be remiss in not mentioning my family, especially my parents, spouse, and children. Their belief in me has kept my spirits and motivation high during this process.
I dedicate this work to my guide **Dr Rakhal Gaitonde** and to my spouse **Dr. Sandeepa V T** without them it wouldn't have evolved.

DECLARATION

I hereby declare that this dissertation titled "Understanding dimensions of resilience in non-communicable diseases (NCD) management among people living in flood prone areas of Alappuzha district, Kerala" is the bonafide record of my original research. It has not been submitted to any other university or institution for the award of any degree or diploma. Information derived from the published or unpublished work of others has been duly acknowledged in the text.

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CERTIFICATE

Certified that the dissertation titled “understanding dimensions of resilience in non-communicable diseases (NCD) management among people living in flood prone areas of Alappuzha district, Kerala” is a record of the research work undertaken by Mr. Benkim B A in partial fulfilment of the requirements for the award of the degree of “Master of Public Health” under my guidance and supervision.

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August 2023

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GLOSSARY OF ABBREVIATIONS

ASHA	Accredited Social Health Activist
CBPR	community based participatory research
CHC	Community Health Center
CMNNDs	communicable-malnutrition- maternal-newborn diseases
DALYs	Disability-adjusted life years
FHC	Family Health Center
HFA	Hyogo Framework for Action
IDNDR	International Decade for National Disaster reduction
KSDMA	Kerala State Disaster Management Authority
LMIC	Low- and middle-income countries
NCDs	Noncommunicable diseases
NPCDCS	National Program for Prevention and Control of Cancer, Diabetes, Cardiovascular Diseases and Stroke
NREGA	National Rural Employment Guarantee Act
PHC	Primary Health Center
PI	Principal Investigator.
SDG	Sustainable development goals
SEAR	South-East Asia Region
SFDRR	Sendai Framework Disaster Risk Reduction
UNDRR	United Nations Office for Disaster Risk Reduction
WHO	World Health Organization

ABSTRACT

Background: In the twenty-first century, the global burden and threat of non-communicable diseases (NCDs) constitutes one of the major challenges for sustainable development. The change in climate pattern and its intensity and frequency makes it difficult to forecast, which leads to disasters.

In the recent years, Kerala has been subjected to recurring large scale natural calamities, mainly annual floods**.** The district of Alappuzha is prone to periodic flood and costal erosion. The interruptions caused by these natural calamities make disruptions to management of NCD regimes of those who are under treatment. There is a need effective management of NCDs in achieving community resilience to overcome the burden of the disease especially in disaster prone areas.

Methods: This is a community study among the people living in disaster prone areas of Alappuzha district, especially areas affected by periodic flooding and coastal erosion. This study focused on mapping the disruptions in NCD management in disaster prone areas of the district. The participants for the study consist of people who were under regular treatment of NCD. This explorative study consisted of in-depth interviews with structured open-ended questions. The interviews were transcribed and deductively coded. And the codes were thematically analyzed.

Findings: The gaps in NCD management that emerged from the study at various phases were in screening, there was a poor system of population-based screening and the various structural factors like accessibility, geographical location, livelihood, public health system also hindered the screening process. For diagnosis, the barriers were poor accessibility, nature of occupation,

lack of fully fledged health facility. In treatment, those people living in flood prone area with multimorbidity did not receive adequate supply of medicine from the PHC mainly due to the unavailability. In coastal area regardless of the disease condition majority of people were depending on private pharmacies for their medication since the PHC was very far from their living place. The nature of occupation and poor understanding of disease condition affected the correct adherence to medication. There was no regular system for follow up, the main reasons were poor accessibility to laboratories and treatment facilities.

Conclusions: In the regions which are prone to regular / periodic events such as floods and costal erosion, the system is still focusing on mitigation. For the comprehensive management attention on screening, follow-up and education is needed to uncover unknown burden of NCD which will increase the 'resilience'.

The aspects of resilience that emerged from the study are continuity of medication and treatment among those who are diagnosed with a disease condition. In mitigation**,** in order to have the ability to overcome any disruption one should be aware of the disease condition and need proper control prior to the disruption.

To overcome the structural issues like geography, livelihood, public health system, usual practice may not be effective, therefore innovations like using NREGA for health education, decentralized home based screening and dispensing of medicines, digitalization of the database to be adapted.

CHAPTER 1

INTRODUCTION

Non-communicable diseases (NCDs) are a group of diseases that affect individuals over an extended period of time. Four types of NCDs—cardiovascular diseases, cancer, chronic respiratory diseases and diabetes make the largest contribution to morbidity and mortality. Most of these are strongly associated and causally linked with the major risk factors like tobacco use, harmful use of alcohol, physical inactivity, and unhealthy diet including high intake of sugar, salt and trans-fat. NCDs are the major contributors of rising morbidity and mortality worldwide. The global burden and threat constitute one of the major challenges for sustainable development. NCDs contributes to around 5.87 million deaths, that account for 60 % of all deaths in India annually (Thankappan et al., 2018).India shares more than two-third of the total deaths due to NCDs in the South-East Asia Region (SEAR) of World Health Organization. Various studies depict that the burden of non-communicable diseases (NCDs) has increased drastically and it is worse in low and middle income countries LMIC (World Health Organization, 2013)

In a developing country like India, NCDs account for serious socio-economic impact. So, in order tackle these conditions, it requires a potential scalable, culturally and geographically appropriate and adaptable system.

Natural disasters including floods, earthquakes, landslides, etc. affect adversely the clinical consequences in patients with NCD. The disruption of access to medical care, drug shortage, unhealthy diet, loss of patient's medical records, destruction of transport routes, and disaster-related environmental stress cause the worsening of symptoms and signs in patients. The

effects of disasters in patients with non-communicable diseases require continuous evaluation and follow-ups even for months after the crisis.

Improving emergency preparedness for preplanning and providing self-care training to patients is essential. Safe and correct patient identification during disasters and provision of timely services and relief can reduce the impact of disasters on diseases. (Ghazanchaei, Khorasani-Zavareh, et al., 2021)

The disruption in the NCD care and management due to various natural disasters could have a negative impact on the condition of patient. Patients with chronic diseases are vulnerable to disasters. Disregarding medical care for patients non communicable diseases during and after disasters may cause the worsening of symptoms and signs and even death.

The most important causes of exacerbation in these patients following disasters include loss of medical care, lack of access to medicine, poor nutrition, lack of awareness of patients and medical staff, transportation disruption, lack of laboratory facilities, destruction of medical centers, and loss of medical records. Lack of proper care and treatment, even for a short time, puts at risk patients with NCDs. Patients with cancer, it can exacerbate the disease and increase the risk of death. In patients with cardiovascular diseases, it leads to heart attacks, hypertension, pulmonary embolism and acute MI and death.

The State of Kerala is prone to a host of natural hazards such as coastal erosion, flood, drought, lightning, landslide and earthquake. Almost all districts of Kerala are multi-hazard prone. The topography of Kerala, is prone to frequent natural calamities. The vulnerability caused by the disasters; emerging pandemics can adversely affect the population with NCD treatment regimen.

Kerala has initiated the non-communicable diseases (NCDs) control programs Amrutham Arogyam and was successful in developing and implementing them. The state has achieved a strong and efficient network of health care system in course of time. Apparently, Kerala has entered in to the third phase of demographic transition where the life expectancy has increased with a dominance in chronic diseases.

1.1 Background

The state of Kerala is placed at the highest epidemiologic transitions zone which had exerted drastic effects on the morbidity and mortality tables. Irrespective of the region and economic strata, changing lifestyle of the people makes the state fertile for non-Communicable diseases to flourish. The available studies on prevalence of these diseases indicate high trends of NCD placing the state in the top spot of prevalence chart. The study conducted by Achutha Menon Centre for Health Science Studies in 2017 was a shocking revelation into precarious the position of the state with findings pointing that one in five of the population being diabetic and one in three being hypertensive. This along with the poor control rates and high out of pocket expenditure for the management of this diseases made Kerala the hub of Non-Communicable Diseases in the country

Evolution of NCD Control program started during the early 2000s with projects and government sponsored programs in selected districts of the state. But it was after the introduction of the centrally sponsored National Program for Prevention and Control of Cancer, Diabetes, Cardiovascular Diseases and Stroke (NPCDCS) a structured program for control of NCDs was developed in the state during 2010. In Kerala, the state run Non-

Communicable Diseases Control program- Amrutham Arogyam has kick started parallelly which has been implemented and is being well executed in every district of Kerala.

Climate change is becoming another biggest global health threat. Health is affected by the changing climate and disasters through direct impacts (heat waves, droughts, heavy storms, and sea-level rise), and indirect impacts (vector-borne and airways diseases, food and water insecurity, undernutrition, and forced displacements).

The Sendai Framework for Disaster Risk Reduction 2015 – 2030 proposed the transition of policy approaches from preparedness and mitigation to **resilience**. Following this, WHO Regional Office for South-East Asia (SEARO) has come up with guide lines for the integration of NCD care in emergency response and preparedness in 2018.The Kerala state disaster management authority (KSDMA) has also incorporated preparedness, emergency response and recovery in the Standard Operating Procedures & Emergency Support Functions Plan in every phase of disaster. Still various the studies show the gaps in NCD management during this kind of disasters or calamities.

Now it has come very much necessary to create plan and strategies in emergency situation before a disaster occur. Ensuring Adequate access to medicines and medical care, improving the level of cooperation between national and international agencies in the field of public health, appropriate response of the emergency team in emergencies, preservation and management of patient information and records, integration of non-communicable diseases in policy Instructions and guidelines in critical situations, self-care training for patients in disasters, training of health care workers, the existence of an emergency evacuation plan for patients with chronic diseases, and the provision of psychiatric interventions help reduce the effects of disasters on patients.

In the recent years, Kerala has been subjected to recurring large scale natural calamities, mainly annual floods. The intensity of rains and devastating capacity floods have increased in the recent years. However, in Alappuzha district especially the regions of Kuttanad which is below sea level there have been seasonal floods with high levels of destruction over decades now. The management of NCD regime is disrupted in these areas. So, there is a need of policies and guidelines specific to these regions for the efficient management.

1.2 Rationale of the study

The change in climate pattern is causing disruptions globally and intensity of recurring natural disasters has been increased. These changes are adversely affecting the people especially in terms of health. In the case of chronic disease conditions these disruptions it has a greater impact in long term. Whenever there is a disruption, systems focus will be on mitigation, when it come to the NCD management the treatment regimen gets interrupted during the acute phases.

In the recent years, Kerala has been subjected to recurring large scale natural calamities, mainly annual floods. The character and after-effects of rains and floods have started changing**.** The district of Alappuzha is prone to periodic flood and costal erosion, low-lying areas of Alappuzha District has been witnessing periodic floods every year. During floods the people face disruptions in normal living, many of the times they get displaced to relief camps. For those who are under NCD treatment, interruptions in the NCD management at various stages of disaster worsen the condition.

To become a community to be resilient to NCD management there should proper guidelines, protocol and policies exclusively for each of these geographically vulnerable regions. In order

to achieve 'resilience' it is required to identify the potentials barriers as well as the different coping mechanisms adopted by the community as well as the system. Identification of these parameters can be used as a potential scalable model that can be implemented at different settings.

1.3 Objectives:

1. To map out the difficulties faced by the patients in NCD management in flood prone areas of Alappuzha district.

2. To derive health system services components that could contribute to making NCD management **"resilient"** in a flood prone area.

This study aims to identify the disruptions faced by the patients with regard to NCD management in a flood prone area during the pre, acute, and post- floods period. The study will especially focus on the ways in which the management of NCDs is disrupted.

The focus will be to understand the challenges faced by the patients during flood in their NCD treatment and care and also to identify the gaps in current services provided by the NCD program in light of the needs of the community. This study also tries to explore preparedness of the system as well as the community for the NCD care and management during flood. It also aims to explore and map coping strategies and structures in the community and health system that ensure some continuity in NCD management during disasters.

The outcome of the study will be to propose ways to move towards optimum NCD management relevant to the context of floods by drawing lessons from a flood prone area to inform the development of NCD inclusive policy on disaster management in Kerala.

CHAPTER 2

LITERATURE REVIEW

2.1 Non-communicable diseases

In the global burden of disease study "Nations within a nation: variations in epidemiological transition across the states of India, 1990–2016" (Dandona et al., 2017) ,observed the transition of NCDs, it was found out that among three of the top five causes of disease burden in India was NCDs making a shift from communicable malnutrition maternal newborn diseases. (NPCDCS, MoHFW,GOI, 2023)

According to the study report "India: Health of the Nation's States" published in 2016 it was shown that in India DALYs due to injuries and NCDs have exceeded those from other communicable, maternal, neonatal, and nutritional diseases (CMNNDs). It has also reported that the contribution of non-communicable diseases to total deaths by age groups for all of India was reported as **61·8%.** (Status of Non-Communicable Diseases (NCDs) in India, 2023)

The studies on the adult population in Kerala showed 40% of them had either high BP or raised FBG. Also 83% of the adult population had at least one NCD risk factor, (Sarma et al., 2019)

2.2 Non communicable disease and disasters

In the study using PRISMA standards to understand the Impact of Disasters on Non-Communicable Diseases it was found that the occurrence of disasters affected the management, treatment and care of those patients who had one or more than one NCD

condition. The study also proposed the need of shift from traditional approaches. And also need of comprehensive planning of health care by the various stake holders on different strategies to enable patients to access better service and care during disasters.(Ghazanchaei, Khorasani-Zavareh, et al., 2021)

In a scoping review of NCD management on the challenges associated with NCDs management in natural disaster settings. They observed the need of developing evidence-based strategies to integrate NCD management into regional and national disaster management plans. (Hassan et al., 2020)

In the systematic review of NCDs in disasters the authors observed the negligence of comprehensive response to NCD management during disaster periods. The comprehensive response can significantly reduce the potential risks associated with disasters. (Ghazanchaei, Mohebbi, et al., 2021).

In the study "Provision of the Continuum of Care to Noncommunicable Diseases Post-Floods in Kerala, India 2018" conducted post 2018 flood in Kerala, authors formulated steps to tackle NCDs during the disaster. They have proposed six areas of focus, prioritizing of major NCDS, patient estimation and drug stock preparation, protocol for standard treatment, mapping of referral facilities, public engagement, and daily reporting of NCD consultations". (P. Ganeshkumar et al., 2022)

2.3 Community resilience and disasters

In the field of disaster risk reduction, community resilience is defined as "the ability of a system, community or society exposed to hazards to resist, absorb, accommodate to and recover from the effects of a hazard in a timely and efficient manner, including through

the preservation and restoration of its essential basic structures and functions" (Abrash Walton et al., 2021) From the disaster risk reduction perspective, a resilient community is one that has the ability to prepare for threats; (2) reduce vulnerability by decreasing disaster risks; (3) absorb and recover from disasters; (4) adapt to changing conditions; and (5) sustain the health of the community (Abrash Walton et al., 2021)

Studies are now focusing on resilience than vulnerability for disaster risk reduction, during pre- and post-disaster mitigation phases (Alshehri et al., 2015)

In disaster mitigation recent studies are giving more importance to community with major focus on capacity building of the community. (Bosher and Dainty, 2011)

Attempts has been made to model a community resilience index for capacity development to meet social needs, social learning, and participatory deliberation. So that the policymakers and authorities can make use of it to frame policies (Ali and George, 2022)

2.4 Flood in Kerala

"In Kerala14.52% of the total area of the state is prone to floods. In Allepey district more than 50% percentage of area is flood prone. These floods are mostly confined to the Kuttanad region" (CESS 2010).

The study on Kerala floods of August 2018 proposed the integration of NCDs in emergency management plans for mapping service provisions, organizing services delivery and integrating into primary health care during the emergency phase. (Study report: Kerala 2018, 2018)

2.5 Policy and Frame works.

2.5.1 Evolution of frame works

The following is a listing of the some of the main developments of disaster management developed by the UN.(bb, 2005; Tiernan et al., 2019)

1989: International Decade for National Disaster reduction. (IDNDR)

1994: Yokohama Strategy and Plan of Action

Focus areas- on prevention and mitigation managing risk.

1999: International Strategy for Disaster Reduction (ISDR)

Focus areas- on Coping capability and risk preparedness intervention

2005: Hyogo Framework Action

Focus areas -Understanding risk, reducing risk factor building knowledge

2015: Sendai Framework for Disaster Risk Reduction (SFDRR 2015-2030)

It is supported by SDGs 11, adopting and implementing SFDRR holistic disaster management at all levels (focus areas -hazard focus, reduction of disaster risk and losses in lives, livelihoods and health intersection of disaster risk and climatic change, building resilient community

Apart from these the Kyoto Protocol, which was adopted in 1997 and entered in to force on 2005. It the objective was to reduce the onset of global warming by reducing greenhouse gas concentrations. It had the caption “common but differentiated responsibilities”. (Kyoto Protocol,2005)

Sendai Framework was the successor of Hyogo frame work with priority areas in recovery, rehabilitation and reconstruction. (Sendai Framework for Disaster Risk Reduction 2015-2030 | UNDRR, 2015: 2015–2030)

The Sendai Framework for Disaster risk reduction was more focused, concise, forward-looking and action oriented. The transition or evolution of the previous United Nations World Conference on disaster Risk reduction for the sustainable development, the Yokohama Strategy for a Safer World from which developed the guidelines for Natural Disaster Prevention, Preparedness and Mitigation and its Plan of Action had established ten principles for its strategy, a plan of action and a follow-up. (Sendai Framework for Disaster Risk Reduction 2015-2030 | UNDRR, 2015: 2015–2030)

Then the Hyogo Framework for Action put forward to Build the Resilience of Nations and Communities to Disasters. It describes and detail the work required from all different sectors and actors to reduce disaster losses. It was developed and agreed on with the many partners needed to reduce disaster risk – governments, international agencies, disaster experts and many others – bringing them into a common system of coordination. The HFA, which ran from 2005 to 2015, set five specific priorities for action, making disaster risk reduction a priority, improving risk information and early warning, Building a culture of safety and resilience, Reducing the risks in key sectors, Strengthening preparedness for response. (Hyogo Framework for Action 2005-2015:, 2005)

The Sendai framework suggests a shift from prevention, preparedness and mitigation to actions to build resilience, taking into account the experience gained by States at local, national, regional and global level, the Sendai Framework for disaster risk reduction formulated four priority areas as 1) Understanding disaster risk. 2) Strengthening disaster

risk governance to manage disaster risk.3) Investing in disaster risk reduction for resilience. 4) Enhancing disaster preparedness for effective response and to "Build Back Better" in recovery, rehabilitation and reconstruction.

Though the focus of response has been on the management of immediate trauma and communicable diseases that occur in the immediate post disaster situation, the newer frameworks suggest to refocus disaster risk reduction strategies and resources to the most vulnerable populations attention to activities in mitigating NCDs needs. The frame work has proposed to integrate disaster risk management into primary, secondary, and tertiary health care, especially at the local level; developing the capacity of health workers in understanding the risk, to enhance the resilience of national health systems. The people in the design of policies and plans to manage their risks before, during and after disasters, including having access to life saving services.

WHO policy framework for integration of care of NCD in emergencies provide technical guidance to emergency planners, emergency care professionals and policy-makers to integrate NCD interventions within the national health emergency response in each phase of disaster.

EnRiCH framework (O'Sullivan et al., 2014): The EnRiCH Community Resilience Framework for High-Risk Populations, help to identify the factors that enhance or create barriers to community resilience to disasters. It is a community based participatory research (CBPR) approach which focus on interventions that utilize to build adaptive capacity. The main drivers of adaptive capacity include empowerment, innovation, and collaboration.

"Orange Book of Disaster Management by Kerala State Disaster Management Authority" (KSDMA) consist of Standard Operating Procedures & Emergency Support Functions Plan. (Orange Book of Disaster Management, 2019). The WHO policy framework for integration of care of NCD in emergencies by regional Office for South-East Asia (SEARO) provides technical guidance to emergency planners, emergency care professionals and policy-makers. These guidelines can be adapted to disaster management guidelines of the state for better NCD management during disaster. (World Health Organization. Regional Office for South-East Asia, 2018) These guidelines can be used as a reference to the NCD management in disaster prone area.

The orange book of Kerala disaster management has guidelines specific to NCD management. It has got many gaps at various stages of NCD management during a disaster situation. The following table highlight some of the major areas which has to be addressed in the guidelines of state disaster management with regard to NCD treatment.

2.5.2 Comparison of WHO guidelines and KSDMA

In the following table (Table 1) has a brief analysis of KSDMA disaster management guide lines specific to NCD management with the WHO guidelines for NCD in Disaster specific to South-East Asia Region. The WHO guidelines provide a detailed action plan for various stages of NCD management and specific tools and guidance for each of these action plan.

The comparative study between various frameworks and guidelines help to identify the gap in the NCD management program specific to disaster conditions. The WHO

guidelines provide a brief overview of impact of emergencies on people with NCDs and describes the priority actions and tools in relation to NCD care during emergencies.

(Orange Book of Disaster Management, 2019; World Health Organization. Regional Office for South-East Asia, 2018)

Table 2.1 Comparison of WHO guidelines and KSDMA

WHO guidelines for NCD in Disaster (SEARO)		**STATE DISASTER MANAGEMENT AUTHORITY**
a. Mitigation and preparedness phase		
ACTION PLAN	**TOOL/GUIDANCE (suggested to be used)**	**Guidelines on NCD and disaster**
1.NCD profile	WHO STEPs TOOL	No detailed and proper guidelines on creation and maintenance of disease profiles of different communities.
	Centre for disease control Behavioral Risk Factor Surveillance System (CDC-BRFSS tools)	No particular guidelines for behavioral risk factor surveillance.
	Reports of National NCD surveys	No sufficient data of surveys

2.Preparedness plans and service-delivery readiness.	Hospital Emergency Response Checklist.	Inclusion of NCD specific services and infrastructure not available.
	Service Availability and Readiness Assessment.	Not mentioned about specific skills on NCD management
3. Review essential medicines list, drug supply and stock piles	National List of Essential Medicines and technologies including that of NCDs.	Adequate supply of medicines, equipment & personnel.
	WHO-PEN list of essential medicines and technologies	Does not have the data base of essential medicines or the technology for that.
4. Support patient-tailored disaster preparedness plans.	Standard communication materials for person with chronic disease	There is no unique way for communication
5. Promote self-care and adherence, risk reduction and prevention messaging.	Include NCDs in standard communication packages.	Does not have such communication packages
b. Emergency phase		
1.Include NCDs in rapid assessments	1.CDC-CASPER. (Community Assessment for Public Health Emergency response)	There is no specific mention about including NCDs in rapid assessments in the guidelines:
	2. Multicluster /Sector Initial Rapid Assessment (MIRA).	No identification of humanitarian priorities

2. Map NCD service provision. Concept of (4W) who's doing what, where, and when.	Health Resources Availability Monitoring System HeRAMS framework.	No mapping of NCD service provision and resource availability
3.Organize NCD services delivery with a focus on primary health care	Interagency Emergency Health Kit (IEHK) checklist, WHO Eastern Mediterranean Regional Office EMRO Kit for slow-onset emergencies.	Clinical care services, preventive care and other public health measures in camps.
4.Provide information about NCD services	Include NCDs in standard communication packages.	No standard communication packages.
c. Post emergency phase		
1.Conduct Post Disaster Needs Assessment	Inclusion of NCDs in PDNA tools. (Post-Disaster Needs Assessment)	lack of Post-Disaster Needs Assessment)
2.Debrief and share lessons learned.	Include NCDs in briefs.	Epidemic prevention in the field, mental health care, medical rehabilitation and follow up
3.Strengthen health system response, scaling up NCD integration into primary health care.	Implement PEN or any other primary care package for management of major NCDs (Package of Essential NCD interventions	Interventions are at certain Level only.
4.Strengthen public health response, including control of risk factors at both individual and population-based level.	Strengthen health promotion focusing on four major risk factors –tobacco, alcohol, unhealthy diet, physical inactivity	Awareness programs are happening

CHAPTER 3

METHODOLOGY

3.1 Study Design

This method adopted is qualitative study by conducting in depth interviews among the community. Deductive coding followed by thematic analysis was done after the transcription of in-depth interviews. This explorative research which tried to map the dimensions of disruption and coping measures taken by the community and the health systems in NCD management in disaster prone areas of Alappuzha District, which can contribute to a better understanding of intervention that will potentially increase resilience in non-communicable diseases (NCD) management among the people living in flood prone areas of Alappuzha, as well as in Kerala in general.

3.2 Study setting

The study was done at flood prone areas of Alappuzha district, Kerala. The study settings were

(i) Kainakary Panchayat (affected by Periodic flood and people are annually displaced to camps)

(ii) Nedumudi Panchayat (affected by periodic flood, but people are not usually displaced)

(iii) Ambalapuzha North Panchayat (a coastal area affected by sea erosion)

These regions were selected from hazard map of Kerala state Disaster Management Authority (KSDMA).

Participants were chosen from selected wards of each panchayat from the NCD registry.

3.3 Sample Size

The selected sample size was 18 (in-depth interviews). A purposive sample of individuals to obtain a diversity of settings was chosen. Thus, I used geographical setting and consequent exposure to different levels of displacement, gender and whether the individual has a single or multiple NCDs as axes for choosing the study participants

3.4 Sampling frame:

NCD registry of

1.Kainakiri grama panchayat. (15 wards)

2.Nedumudi grama panchayat. (15 wards)

3.Ambalapuzha north grama panchayat. (18 wards)

3.5 Sample Selection

The sampling method adopted was purposive sampling technique. The list of participants was taken from NCD registry maintained with the concerned Health institutions (PHC/FHC/CHC), of the panchayat of Kainakiri, Nedumudi and Ambalapuzha north. Participants consisted of patients seeking treatment for Non communicable disease from three different settings.

(i) Those who experience Regular flood and usually are displaced to relief camps

(ii) Those who experience Regular flood and usually remain at their own place.

(iii) Those who experience flooding in coastal areas.

Participants were selected from the list of NCD patients through lots. Equal representation of patients with one NCD condition and multimorbidity were ensured. Also, fair representation of both male and female was attempted.

3.6 Subject Selection

Inclusion criteria.

- Permanent resident for at least five years.
- Taking NCD treatment for more than three years.

Exclusion criteria

- Bedridden and homebound patients.
- Migrant workers.

3.7 Data Collection

Data collection was carried out by the Principal Investigator (PI) during the month of April and May 2023.Six participants were chosen for in depth interview from each study setting. The interviews were conducted at a convenient place as suggested by the participant. All interviews were conducted in Malayalam and were recorded. A field diary was also maintained for various observations. Informed consent was obtained from every participant prior to interview. Care was taken to ensure the privacy and confidentiality of the respondents.

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3.8 Qualitative study

The check list developed for the IDI covered details of NCD management spread across the experience during three periods of time - pre disaster, during disaster and post disaster and further classified according to the life cycle of the disease (from a program perspective) that is screening, diagnosis, management and follow up.

Open-ended questions were used to initiate conversations that sought to capture the experience of the disruption of and coping by the community during the three time periods pre disaster, during disaster and post disaster.

The guidelines were in English and Malayalam. Each interview lasted for about 20 to 25 minutes.

3.8.1 Domains of In-depth Interview.

I) BEFORE DISASTER (prevention, mitigation, preparedness)

This section focuses to capture information on screening, the screening camps being conducted, implementation of the state run NCD program (Amrutham Arogyam), awareness about the disease, source of information about complication of the disease condition, prevention and control measures, prevention strategy by the patient.

The following data were captured

-Regular screening and detection camps.

-Place of screening whether government institutions or private. Reason for choosing private institutions.

-The source and availability of the medicine, how long do they stock medicine.

-Any interruption in supply of medicine.

-Availability of medicine at the health center.

-Understand about the services of ASHA, and other health personals.

-Task sharing and patient-centered services that reduce the barriers to medication.

II) DURING FLOOD.

-Interruption in medication, treatment and follow up.

-The storage of medicine. availability of medicine, any difficulty in taking medicine.

-The kind of follow up by ASHA.

-Experience in the flood relief camps, availability of the doctors, prescriptions, vaccine storage (insulin).

-The regularity and uninterrupted supply of quality-assured medications.

-The preparedness of the system.

III) POST FLOOD (response, recovery, reconstruction)

- kind of exacerbations.

-Getting back to normal after flood.

-Supply of regular medicine, system readiness, referral units.

-Monitoring and follow ups.

-The factors other than availability, prescription.

3.9 Data Storage

All data including the consent forms are secured by the PI, who shall bear sole responsibility for keeping the data secure and for any breach of confidentiality. The recordings and transcriptions were stored in password protected device and cloud storage of Sree Chitra Tirunal Institute for Medical Sciences and Technology (SCTIMST).

3.10 Data Entry

English translated transcripts of In-Depth interviews were entered in MS word and thereafter coded using Microsoft Excel for further analysis.

3.11 Data Analysis

The qualitative data (in depth interview) was analyzed in Microsoft excel using deductive codes that were identified by reading the translated transcripts.

3.12 Development of Codes for Qualitative Analysis

The codes for analysis were to be identified after reading through the interviews and listing the types of interruptions in NCD management. After the Deductive coding thematic analysis was done. For the thematic analysis, a matrix of study settings and different stages of NCD management were created.

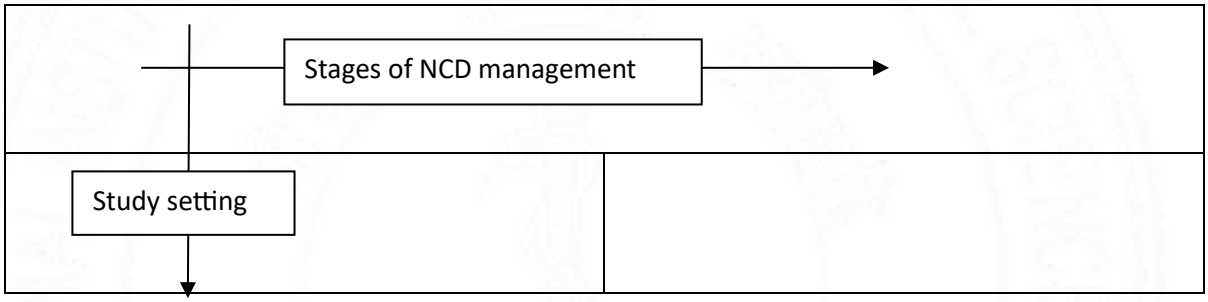

Figure 3.1 Matrix for thematic analysis

The Figure 1 show the matrix for thematic analysis with rows consisted of study settings which were (i) Kainakary (ii) Nedumudi (iii) Ambalapuzha North. The columns consisted of different stages of NCD management that includes (i) screening (ii) diagnosis (iii) Treatment (iv) Follow up.

3.13 Ethical Considerations

The study was carried out only after review by the Ethics Committee of Sree Chitra Tirunal

Institute for Medical Sciences and Technology (SCTIMST). The principal investigator has taken the written informed consent from each study participant for participation in the study. The consent form along with participant information sheet with study specifics and the principal investigator's contact information were provided to participants. Respondents had the option to accept or decline participation in the study, and they could withdraw at any time throughout the study without giving a reason. Participants was told about the study's voluntary nature, objectives, and potential benefits and risks. The privacy and confidentiality of the participants' personal information was given the highest attention, and the data obtained was not shared with anyone who is not participating in the study. Care was taken to protect the identity and location of the respondent; no identifiers were mentioned in the interview schedule other than a unique code.

3.14 Expected Outcome

The study aimed to map out the difficulties faced by the patients in NCD management in flood prone area and thereby deriving health system services components that could contribute to making NCD management “resilient” in a flood prone area.

The outcome of the study will identify the factors which has to be considered in

1.strengthening of upstream and post-disaster phases.

2.Preparedness plans and service-delivery readiness, specific to NCDs needs development.

3.Patient-tailored disaster preparedness plans (taking into account multi-morbidity).

4.Proper review of essential medicines list, drug supply and stockpiles.

5.Need for inclusion NCDs in rapid assessments.

6.Map NCD service provision and Provide information about NCD services

7.Community Engagement during Up stream and post-Emergency phase

3.15 Positionality

The principal investigator has background in Mechanical Engineering discipline, the competency in management studies and interest in climate change and health and has led to this topic of study. The possible bias may be the in the questionnaire of treatment session I could not go in to more details of type of medication and the biochemical test results. Rather the focus was on management of disease condition.

3.16 Limitations of the study

The sample size selected may not be representative due to the geographical and population diversity. For the study consisted of only participants with selected NCD conditions such as diabetes, hypertension and cholesterol, which is not inclusive of all NCD management.

The people of Kainakary and Nedumudi, are living scattered which are separated by water bodies. The population were not densely inhabited, there is diversity of experiences among them. The connectivity is complicated between the places, so better accessibility to the people was possible only through ASHAs.

CHAPTER 4

RESULTS

In this chapter the general characteristics of the different areas studied as derived from direct observation (from notes in the research diary) and from the interviews are presented. This is followed by findings arranged and analyzed based on the different stages of NCD management which are (i) screening, (ii) diagnosis, (iii) treatment and (iv) follow up. For the treatment aspect alone, the findings are discussed as preparation, acute phase and post-acute phase with reference to the disruption caused by acute disaster events like floods.

4.1 The low-lying areas of Kainakary and Nedumudi

In general, the travel to and from the region, the stay in the region during data collection and the interviews revealed that the road connectivity is very poor in the low-lying areas of Kainakary and Nedumudi, though the coastal area of Ambalapuzha had much better connectivity. In Kainakary the people depended on water-ways as the main mode of transport. Majority of the people reported being engaged in agriculture and allied jobs for their living. The main agricultural crop was rice, as the land was reported suitable for rice cultivation. There are two farming seasons in a year and thus both livelihoods and work intensity were seasonal in nature. All the participants reported that during the monsoon there would be flooding and depending on the intensity and duration of flood people would sometime need to relocate. Those in Kainakary reported an almost yearly routine of displacement, while in Nedumudi it

was more sporadic. Thus, communities in Kainakary seemed more prepared for displacement than compared to Nedumudi who experienced flooding but rarely displacement.

The health facility for those in Kainakary is PHC Kuppapuram and the first referral unit is CHC Chempumpuram. Both of the health facility is located at flood prone area and the connectivity is very poor. The accessibility to PHC Kuppapuram is only through boats. There is a floating dispensary under the Kuppapuram PHC which has a dedicated doctor and a nurse accompanied by the corresponding ASHA worker, which visits specified location in turn monthly.

Nedumudi is again affected with periodic flooding. The concerned government health facility is PHC Kuppapuram and the first referral unit is CHC Chempumpuram. Nedumudi has better road connectivity to other private clinics and labs.

4.2 The coastal area of Ambalapuzha

Ambalapuzha north is a coastal region towards the south west of Allappuzha district. It is a region which is under the threat of coastal erosion. Majority of the people depend on fishing and allied activities for living. Again, most of it are seasonal occupation. The primary health center associated with it is PHC Kanjippadam. The first referral unit is Medical College Vandanam.

The figures in the following pages, the Figure 2 is the photograph of PHC Kuppapuram, which is surrounded by waterbodies the main accessibility to the PHC was through water transport then. It is located at one of the most flood prone area which is retained by “bunds”. When closely examined the basement of PHC was below water level. Figure 3 is the image of a

typical house in Ambalapuzha north which is proximate to sea the boats docked beside it depict it. Again these regions are under the threat of periodic costal erosion. The participants during the interview also mentioned about the houses washed away beyond the house in picture.

Figure 4.2 PHC Kuppapuram

Figure 4.3 Typical fisherman house in Ambalapuzha North

4.3 Description of participants

A total of 18 interviews were conducted. Of these around 40% (7) were male and the remaining 60% (11) were female (see Figure 4 (b)). The average age of those interviewed was 63 years. The participants age ranged from 37 to 88 years (See Figure 4 (a)). Of those interviewed nine had only one of the chronic diseases – either hypertension or diabetes, while nine had two or more disease condition. In depth interviews were conducted for six people each from Kainakary, Nedumudi, Ambalapuzha North respectively.

4.4 Socio demographics

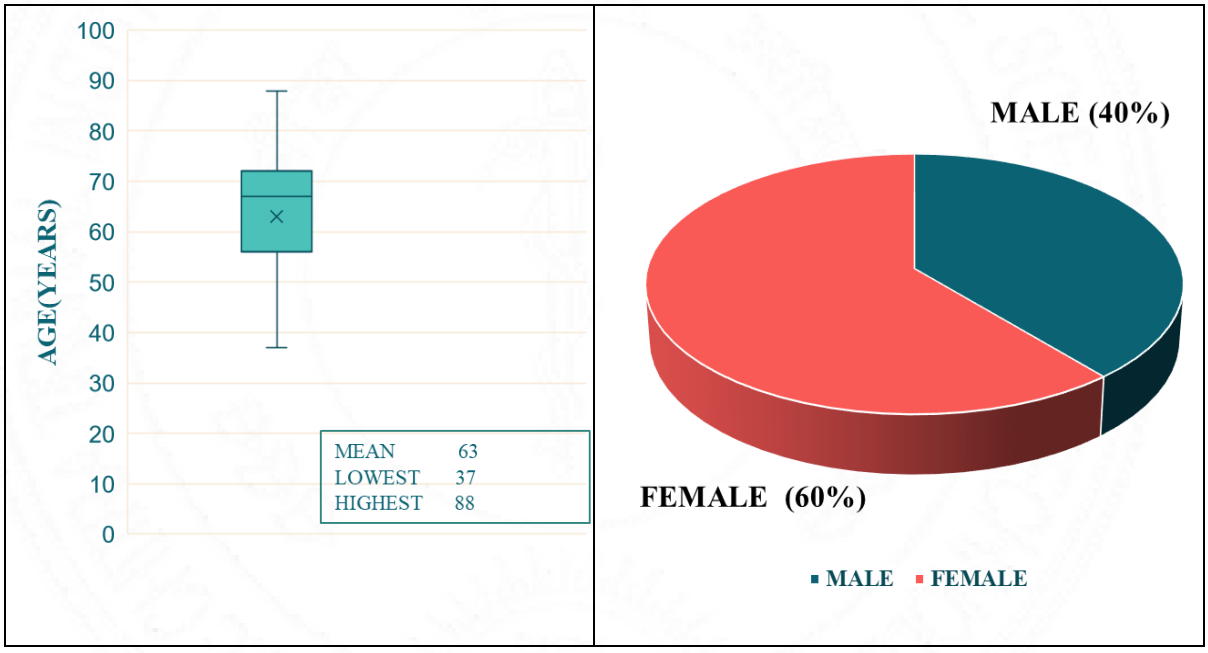

Figure 4.4 (a) age distribution of participants (b) sex of participants.

4.5 Analysis of in-depth interview

4.5.1 Screening

One of the important components of the NCD program is screening. As per the program, population-based screening it is expected to screen all healthy men and women 30 years of age. This has to be done by frontline health worker with the help of ASHAs at a convenient place. The screening must also include prevention and health promotion, counselling, and referring those who are screening positive to the appropriate and respective PHCs or CHCs.

(a) Screening for NCDs in the study setting.

Community screening process.

Regular community-based screening is not happening at any of the settings. Even though there is occasional opportunistic screening happening among those attending the public sector.

During observations it was found that all PHCs maintain the list of patients screened, with their BPs recorded. The information gathered during the opportunistic screening do not seem to be conveyed to people, all the people met and those interviewed who reported having BP measured could not recall any feedback with regards to whether the BP was normal or not and whether any follow up action was required or not.

However, there were occasional reports of camps for other diseases, conducted by NGOs where unexpected abnormal bio-chemical parameters were detected and acted upon.

"Once there was there was a cancer detection camp during the 'thozhilurappu'(MGNREGA)…. from there when they tested my sugar level was very high…... And the nurse there she asked me to go to the hospital next day itself". [Female; Single NCD; Ambalapuzha]

From the interviews it became clear that there was no regular systematic screening program for NCDs, and most detection were happening in an ad hoc fashion. Where there were attempts at systematic screening, the information did not seem to feed into the overall NCD management at a program level.

(b) Ineffective NCD screening camps.

While it was reported that there were screening camps specifically arranged from NCDs, The number of new persons attending the NCD clinics was reported as being very less. It is gathered that the main reasons for lack of attendance of people were their engagement with intensive seasonal occupation, lack of prior information, and difficulty in access.

"I am not aware of any kind of regular camps or such, but I heard about some "eye camp" at nearby areas" [Female; Single NCD; Kainakary]

Thus, structural factors peculiar to a region that was flood prone and geographically unique meant that the usual strategies used in non-flood prone areas were not effective there.

(c) Poor Accessibility to health facility:

The location of the health centers makes it difficult to the people to avail the facility. In the low-lying areas it was a lack of easy road access and the dependence on boats that made it difficult for the community members to access the PHC. In Ambalapuzha, while there is a relatively better network of roads the distance to the designated PHC (which is nearly 4km away) and the better accessibility to numerous private clinics in the vicinity of Vandanam Medical college meant that people from that location rarely approach the PHC.

> **"....***it is very difficult to reach Kuppapuram from here we have to board two boats to reach there. So normally I don't go to Kuppapuram PHC."* [Male, Multimorbidity Nedumudi]

While the private sector is more accessible in many cases, the fact that the system is not regulated by the public sector, and does not provide any information to the public sector means that all NCD activity happening in the private sector is not recorded in the information system or by the NCD control program.

> *"We used to go to some private clinic for any illness, it is more convenient for us .... after diagnosed with hypertension I am also planning to visit the PHC at Kanjippadam .....I am yet to open a book there. The ASHA has asked me to open a book so that I get*

medicine from there and she has asked me to get it done by the doctor at PHC as soon as possible.....[Male; Single NCD; Ambalapuzha North]

(d) Lack of awareness.

In general, when questioned people did not report knowledge of risk factors, their association with chronic disease and the need to control or manage these risk factors. It emerged that most interaction with the public health system staff was either at times of emergencies or at the time of collecting medicines (many times in a floating clinic). Further the spread-out nature of the habitations meant that it was very difficult for the health system staff to gather groups of people or even reach people's houses. The health system staff too found travel to and from their place of work challenging, leading to an inability to spend time in the field. All these factors combined possibly lead to poor awareness among the people.

"……*people use to say…. the diabetic people should not take high glycemic index food like rice. I prefer only rice."* [Female; Single NCD; Nedumudi]

(e) Emergent gaps in Screening and determinants

While in general there was a poor system of population-based screening in the community studied it emerged that a number of structural factors worked as obstacles including lack of access due to difficult terrain or distance, intensive and seasonal work, availability of private

sector (in Ambalapuzha) in which program guidelines may or may not be followed, but was definitely not linked to the public health information system.

The strong ASHA network in Kainakary and Nedumudi which played an important role in treatment (described in detail later) was a possible part of the health system that could contribute to the development of a robust screening program. In addition, given the unique nature of the setting traditional strategies like camps may not be the best way to do screening, and making use of natural conglomerations like during the NREGA (Thozhilurappu) may be a way forward for both screening and awareness activities.

The fact that many who were interviewed mentioned that the private sector was many times more accessible than the public sector, evolving innovative programs and strategies to incorporate the private sector to do screening and share information with the public sector could be explored.

Kainakary and Nedumudi have better ASHA network, they are actively involved in dispensing medicines through the boats and follow-ups.

4.5.2. Diagnosis

It emerged from the interviews that in almost all cases people were diagnosed with the disease condition whenever there is some complication for which they visited the hospital. It is observed that these causalities often happen at their working place. Majority of the people are engaged in occupation which require extreme physical labour, again they are exposed to extreme weather condition at the work place.

". while I was working in the Paddy Field, I got wounded on my leg…. Initially, I did not care for that…. but after few days also it did not heal…. So, I seek help of a local person, where he suggested some kind of herbal medicine…. the next day again I had severe pain in my leg and my leg was swelling…. then the people took me to the district hospital…There the doctor there, asked me to check the blood sugar……when checked, the result was very high." [Male; Single NCD; Kainakary]

…., I used to go for. Go for "thozhilurappu" (MGNREGA) …one day I fainted and fell down there…. the people with me have taken me to hospital and the blood pressure was very high when they checked I was admitted there…. admitted there for five days in the medical college….[Female; Multimorbidity; Ambalapuzha North]

Some of the main issues that affected the diagnosis aspect of NCDs were:

(a) Accessibility

Majority of the people are engaged in seasonal occupation, the timings of the PHC make it difficult for them to access them even if they are referred there for confirmation of diagnosis. Thus, so most often people depend on private clinics for their diagnosis.

"……it is very difficult to reach Kuppapuram from here we have to board two boats to reach there. So normally I don't go to Kuppapuram PHC. It is more convenient for us to go to town" [Male; Multimorbidity; Nedumudi]

The people at Ambalapuzha north have Vandanam Medical college nearby, if any casualties people prefer directly going there. At Ambalapuzha people have different choice of easily accessible private clinics, they depend on these clinics or private practitioner. Most often people go to any of these facilities and are not regular to any specific one. However, as this is the private sector people have to pay out of pocket and access to these centres is more constrained by financial issues rather than geography.

(b) Improper Functioning of Health canters.

In the flood prone area of Alappuzha, the PHC as well the primary referral unit CHC Chempumpuram is not equipped with enough facilities and is not functioning as per the timings. The other secondary and tertiary referral units are very far and again the transportation facility is very poor to reach there, by the time people reach the hospital the condition become worse.

> *"I had prescription with me. During the flood…. And my children bought me the sufficient medicine, since the hospital was also flooded that time…. they bought me medicines from private medical store."* [Male; Multimorbidity; Kainakary]

(c) Nature of occupation.

An emergent and recurring theme in all the stages of NCD management was the conflict between the imperative of livelihood and occupation – especially the fact that this was

intensive and had strict time constraints – i.e., Fishing before the seasonal bans, or agriculture before the flooding that is seasonal etc., these pressures meant that people had little choice to make visits to health institutions for diagnostic (or screening activity – discussed above) except for a few months in the year.

> *I am going to sea for work so there we have lot of oily food or curry… so people before going to the sea do the tests…check BP.*
>
> *But……no one has mentioned me before about this…. regarding the screening camps.*
>
> *It is that, those people who are going into the deep sea get the checkups done by themselves from private labs.* [Male; Multimorbidity; Ambalapuzha]

4.5.3 Treatment

(a) Source of treatment

Low-lying area

In the low-lying areas most people, especially those with single conditions and who were registered with the PHC (which was most of the people who participated) received regular medication through the boat clinics at their doorstep. Even if the patient was absent during the time of the visit of the boat clinic, the system allowed anyone with the patients NCD book, to present the book to the doctor in the boat and receive the medicines for a month. Given, this robust system of delivery of medications most people with single conditions received monthly medicines regularly. The issue for people living in Kainakary and Nedumudi arose mainly

when they had more than one illness and then invariably one or another essential medicine would not be available in the PHC.

> *I used to go to district hospital … if there is any necessity, we prefer district hospital …than PHC since it easy for us…. we get the medicines at our places from the boat from Kuppapuram PHC…., I get medicine for cholesterol, Hypertension and ….a anticoagulant ..... Normally, we don't get expensive medicines through the floating dispensary.* [Male; Multimorbidity; Nedumudi]

Coastal area

On the other hand, in the coastal area, all people who were interviewed regardless of whether they had a single morbidity or multiple were dependent on private pharmacies for their medication due to the inaccessibility of the PHC in terms of distance.

> **"***Most of the times I go to private clinics or medical shops, since I have strict work schedule and timings, I won't be able to visit the hospital.* [Male; Single NCD; Ambalapuzha north]

(b) Adherence to treatment

While in general people reported being regular with their medications once diagnosed with a particular disease, once more details were sought a varied set of patterns emerged. Thus, many patients expressed beliefs in the harms of taking medicines on a long term,

…. I think…It isn't that healthy, taking too much tablet…so most of the times I take tablets for few days, say for first seven days...there after I pause it for a while……then I go for the test at the lab…if the sugar level is very high…then I consult the doctor…or if I feel any difficulty, I restart the medicine. [Male; Single NCD; Kainakary]

"*Then the doctor has prescribed me medicine for diabetes…. those were so expensive ….so I had it only for few months…..when I felt issues with my vision, later again I consulted another doctor at private clinic…. and restarted another medicine.*

I am not that regular in medication…..most often I stop the medicine for some period,….and if some discomfort happen only, I restart the medicine…." [Female; Single NCD; Ambalapuzha north]

Some patients defined regularity as having some medicine every day. Even if the recommended dose was twice a day the person considered even once a day taking the medicine as regular.

The other major issue that interfered with adherence was occupational compulsions. Thus, fishermen in the coastal area described how the usual fishing trips sometimes lasted up to 8 days at sea. During this time there was no question of adherence to treatment.

"I am going to sea for work … …. Earlier we use to stay for 6-7 or eight days at the sea …depending on the catch…. Normally food in the boat will be rice and fish, which is cooked there…. [Male; Multimorbidity; Ambalapuzha north]

There was a problem faced by those patients who were taking medicines or depended on medicines from the private sector,

-"I am taking regular medicines after angioplasty... I am not getting every medicine from the hospital…. Costlier medicine we won't get there…. we are buying it from private medical stores…..when there isn't regular job I find it financially difficult to buy often." [Male; Multimorbidity; Ambalapuzha north]

Sometimes damage due to the floods interferes with regular medicine intake. For example, those who are dependent on Insulin. One of the persons I met who was insulin dependent described the last flood damaging the fridge in their house. Thus, he could no long store insulin in it and used to just keep it in cool water. The inaccessibility of the area and financial difficulties meant that the fridge was not repaired.

….. I get Insulin from PHC, for which I have to go there …... we won't get insulin from the boat. I am taking insulin for around 4 years… few times PHC did not have sufficient insulin stock…… that time I have managed to buy it from outside.

"…. see our fridge got damaged during the previous flood, now we are storing insulin it in water" [Male; Multimorbidity; Nedumudi]

During the floods

Preparation

During the floods people in the low-lying areas are usually well prepared for any disruptions. Many people move to safer locations, some people reported stocking up medicines, some people reported the ASHA giving extra medicines in anticipation. However, all these systematic and regular steps were reported from Kainakary – where there is annual / seasonal flooding.

Every year our house will be flooded…during that time we move to our children's house at Coimbatore…. we have two daughters…..one is in Bangalore. …this June 2nd, we are leaving to Coimbatore, they'll come here and pick us. …. after monsoon, by "onam" we will return. [Male; Multimorbidity; Kainakary]

Acute phase:

During the acute phase of disaster most of the people described the disruption of floods happening for a maximum of 10 to 14 days.

Source of treatment during floods

It was observed that in the low-lying areas of both Kainakary and Nedumudi the public health system along with the ASHA and the PHC maintained a list of all patients with NCD. The ASHA in addition was very informed about the medicines being taken, when they were changed etc., this ensured that all patients received a regular stock of medicine especially before the season of flooding and continuity of medicines was ensured. Of course, this was only for medicines that were provided through the PHC. Such a system was not found in the coastal region.

The medicine which was prescribed by the private doctor, from the last month we are getting it from the PHC

[*ASHA over hear this and started asking about the new medicine….. is it Losartan?. Telmisartan ?…….or metoprolol?.* [Male; Multimorbidity; Nedumudi]

We used to stock medicine for one month at least…..we had been to the camp during the 2018 flood there we used to get medicine at the camp.

[*!!!ASHA interrupts… Sir. We used to get medicines there at the camp. There were also other NCD patients there.*]

The camp It was good. There were always nurses and doctors. And it was overall, good there. [Male; Multimorbidity; Nedumudi]

The government provides well-resourced camps at times of flooding. These camps are described as providing good food, three times a day, and having adequate medical personnel However, these doctors in the camp are from outside the district and thus do not know the individual patients.

During the 2018 flood…we went to one of our relatives house again, which was near to a near to a church….were camp was being conducted…… even though we registered in the camp ,we did not stay there….. during flood we got stranded at our place……myself and my wife were taken by a boat….. It was totally an unexpected one. The house was flooded heavily….[Male; Multimorbidity; Nedumudi]

Despite the positive description of the camps very few people described actually staying in them during the whole of the disruption. Almost all people registered in camps as that was a necessary step for receiving compensation from the government. However, most people either moved back to their houses in the flooded areas or moved in with relatives to tide over the situation.

The key determinant of taking preparatory steps and ensuring treatment continuity during the acute phase seemed to be experiencing previous floods and expecting disruptions. Thus, while residents in Kainakary were well prepared, those from Nedumudi who only experienced major disruption during the 2018 floods, mentioned that they did not take any active steps for preparation.

As far as the coastal communities are concerned the threat was more of coastal erosion which is in a way a constant threat without any acute disruptions.

(c) Emergent gaps in Treatment and its determinants

The two key gaps that emerged from the study were, the patient understanding of adherence / regularity and how that interfered with the message of NCD control program; the second was ensuring preparedness before and continuity during the acute disruption.

Sourcing the medicines from the public sector ensured regular supply and regular intake because sourcing from the private sector meant a cost and most people, especially those who were poorer, spoke of financial constraints as one of the main reasons for lack of adherence.

However, even among the drugs provided by the public health system – some drugs were not available an invariably those with multimorbidity had to buy some drugs from the private sector. This meant that multi-morbidity seemed to increase the chances of persons not being adherent.

Experience in the areas that were used to seasonal flooding demonstrated that an efficient public health system including the ASHA (community level worker) were able to ensure medication to those who were registered with them, at least with the medications that were available with the PHC. For those not used to regular / seasonal flooding there was no systematic preparations done.

4.5.4 Follow up

(a) Periodic checkup

Like the screening described above, there was no regular system for follow up of control of NCDs or regular screening for complications like those affecting the eye, kidneys, heart etc., Since regular and comprehensive follow-ups require some minimal biochemical testing which required laboratory set up, it had to be done in a hospital. Further follow up of diabetics had to be done fasting. Given the inaccessibility of the health institutions it was quite infeasible for individuals to do regular follow up.

> *I go to town for the check-up ……. since the lab here open very late in the morning. It is more convenient for me to get it done there. The fasting sugar and the other one…. I f you depend on the PHC, it will be opening very late and we have to wait here until they come. But in town, the lab will be open early morning itself. ….* [Female; Single NCD; Kainakary]

The PHC usually opened only around 9 or 10 am, depending on the arrival of the boat. Thus, usually those who needed to test fasting sugars either skipped testing or went to private clinics (and this depended on the availability of money).

Like in the earlier sections, the livelihood and occupations and the peculiar rhythm of seasonal work interfered in the ability to perform regular follow-up.

(Smiles!!!!) ……. "for the last two months I could not ……harvesting season is going on and I was away for the work at paddy field so I could not check the sugar level……..I was away from my home ……

……..do you know at what time we need to go to field, early morning?...have to be there by 6am…since it is very sunny, nowadays ….. then only we can at least stop before getting too hot… [Female; Single NCD; Kainakary]

People miss the periodic checkup because of the nature of their job. The checkup is done according to their own convenience.

(b) Emerging Gaps in Follow up

As is clear from the above there are a number of reasons for the lack of systematic follow up of control and complications. These include geographic inaccessibility of laboratories, the seasonal and intensive nature of their livelihood and the lack of knowledge on the various aspect of complications and need for follow up.

4.6 Summary

By analysing the data on different study setting it has been observed that interruptions are happening at all stages of NCD management and during every phase of disaster. From the analysis and observation of the data the common factors that emerged where majority of the people were engaged in seasonal nature of job, there was poor awareness about the risk factors

among the people, poor accessibility to PHC hindered the people from proper management of disease.

Screening: No regular screening was happening at any of these places, even if some screening camps are conducted very few attend it. In Kainakary the scattered land masses separated by water bodies make the reachability of health staff difficult.

Diagnosis: Most of diagnosis happened when people were brought to hospital with some casualty. The working time of the PHCs were a major concern for those who were engaged in agriculture and fishing. Again, the health facilities are not well equipped and is prone to flood in low lying areas. People of Ambalapuzha mainly depend on private health centers and labs thus causing financial burden.

Treatment: The low-lying flood prone areas lack treatment facilities in the vicinity. They faced difficulty in storage of drugs. Regarding the availability of drugs people with single disease condition could manage it from PHCs but people with multimorbidity has to depend on the private dispensary for complete medication.

Follow-up: The late functioning time of the lab at PHC Kuppapuram affected the periodic tests and also made people dependent on private labs which are very far from their dwelling places. Periodicity of the jobs also affected the regular follow-up.

CHAPTER 5

DISCUSSION AND CONCLUSION

5.1 Major gaps

The major gaps in NCD management, that emerged from the study were in screening there was a poor system of population-based screening. The various structural factors like accessibility, geographical location, livelihood, public health system also hindered the screening process.

In diagnosis the barriers were poor accessibility, nature of occupation, lack of fully fledged health facility.

Regarding treatment, the people living in flood prone area those with multimorbidity did not receive adequate supply of medicine from the PHC due to the unavailability. In coastal area regardless of the disease condition majority of people were depending on private pharmacies for their medication since the PHC was very far from their living place. The nature of occupation and poor understanding of disease condition affected the correct adherence to medication.

There was no regular system for follow up, the main reasons were poor accessibility of laboratories and treatment facilities. The seasonal and intensive nature of their livelihood and the lack of knowledge on the various aspect of complications added to it.

In nutshell major gaps were emerged in screening and treatment of NCD management, which shows that there may be large number of people who are not diagnosed and there is no clear idea on state of control for those who are diagnosed.

5.2 Coping mechanisms

Individual level: Among those who expect periodic flood, stock themselves with enough medicines and were fully prepared to get displaced to safer place during an acute phase.

System level mechanisms: In the low-lying area of the district, the facility of floating dispensary supplied medicine at their living place also giving extra medicine in advance prior to the monsoon. It also had a dedicated doctor and nurse. Thus, people were observed to have better adherence to medication.

During the acute phase there are predetermined camps equipped with mitigation mechanisms, doctors, nurses, shelter and food.

5.3 Determinants of coping mechanisms

Poverty: Most of the people were engaged in daily wage occupations and had no other source of income. Especially when medicines are not available in PHC people find it difficult to manage.

Geography: The scattered land mass separated by waterbodies made it difficult to access to the public health facilities. Poor transportation, connectivity and frequent floods are the other contributors.

Livelihood: People are engaged in seasonal high intense occupation, like staying in sea for days, early morning work schedule in the paddy fields.

5.4 Public Health System

At the places where there is strong network helps the people in treatment. The weak system makes people dependent on private sector thus reducing the resilience.

5.5 Supporting articles

"The systematic review on Impact of Disasters on Non-Communicable Diseases suggests that the health system should be expanded from traditional approaches to disasters and requires comprehensive planning of health care by policy makers and health professionals to develop effective strategies to enable patients to access medical, therapeutic and diagnostic services in natural disasters". (Ghazanchaei, Khorasani-Zavareh, et al., 2021)

(Metoki, 2021) this study proposes the Effective use of information and communication technology-based telemedicine is necessary to manage the risk of cardiovascular diseases during disasters and pandemics.

5.2 Conclusion

In the regions which are prone to regular / periodic events such as floods and costal erosion, the system is still focusing on mitigation. For comprehensive management, attention on screening, follow-up and education is needed to uncover unknown burden of NCD which will increase the 'resilience'.

The aspects of resilience that emerged from the study are

(i) **During acute phase,** there is need to ensure continuity of medication among those who are diagnosed with a disease condition. This is happening to some extent since the public system has data base of the patients and they are reaching to the community.

(ii) **For mitigation** in order to have the ability to overcome any disruption people need to be aware of the disease condition and need proper control prior to the disruption.

(iii) **Structural barriers** to overcome the barriers like geography, livelihood, public health system, usual practice may not be effective, therefore innovations like using NREGA for health education, decentralized home based screening and dispensing of medicines.

5.3 Recommendations

- Strengthening of public and outreach services.
- Comprehensive planning of NCD management during all stages incorporating various stakeholders, both governmental and nongovernmental institutions and private.
- Developing system that ensure health data is accessible regardless of the particular place of care. E.g., Cloud storage, digitalization.
- Empowering ASHAs in NCD management and formation of community volunteers.
- Intersectoral coordination and innovations to deal with structural issues.

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ANNEXURE I

PARTICIPANT INFORMATION SHEET

Study topic:

IDENTIFY POTENTIAL CRITERIA PERCEIVED AS RELEVANT TO THE NCD MANAGEMENT RESILIENCE, IN FLOOD PRONE AREAS OF ALAPPUZHA Dist. KERALA

I am Mr Benkim B A. I am a final year student doing my post-graduation in Master of Public Health (MPH) at Achutha Menon Centre for Health Science Studies in Sree Chithra Thirunal Institute for Medical Science and Technology, Thiruvananthapuram. As part of my thesis "Identify potential criteria perceived as relevant to the NCD management resilience, in flood prone areas of Alappuzha Dist. Kerala." This is moreover to explore the factors which the people find it relevant in NCD treatment and management in routine practice and during a flood situation. It also tries to understand the health system challenges in NCD service delivery at the flood prone areas. I am here to conduct this focus group discussion community living in the flood prone and sea erosion areas of Alappuzha district.

I am doing my study in panchayats and health centres at flood prone and sea erosion areas. I have chosen this place since it seems to be vulnerable to flood and sea erosion. I would like to know about your care and treatment on NCD on routine basis and the preparedness during flood or high precipitation. I will be asking you some questions about your experiences and challenges you face in NCD management during the situation of flood or extreme weather condition. The duration of the FGD will be 20-30 minutes. I may record the conversation so that I do not miss any of the information that you choose to share with me.

The participation in the study is purely voluntary. If you feel uncomfortable about any question in the study, you are free to ask me to skip the same. You can take your time to answer the questions. You are free to withdraw from the study any time during the interview even after giving consent. Though you will not be directly benefited from the study, the information that you share may be helpful for policy making for disaster management and health system You may feel uncomfortable while trying to answer some of the questions. However, any other serious harm is unlikely.

The recording will not be shared with anybody. I ensure you that any information shared by you will be strictly confidential and only a summary of what you gave will be used for research and publication purposes. The report will not contain your name or the name of the institution.

For any clarification regarding the study, you can contact me and for any queries on the authentication of this study, you can contact the Member Secretary, Institutional Ethics Committee (IEC) of SCTIMST.

Principal Investigator

Mr. Benkim B A

MPH Scholar

AMCHSS, SCTIMST,

Medical College PO, TVM

Member Secretary

ANNEXURE II

ഫോക്കസ് ഗ്രൂപ്പ് ഡിസ്കഷന് മുൻപുള്ള വിവരപ്പട്ടിക

പഠനവിഷയം: ആലപ്പുഴ ജില്ലയിലെ വെള്ളപ്പൊക്ക സാധ്യതയുള്ള പ്രദേശങ്ങളിൽ സാംക്രമികമല്ലാത്ത രോഗം (NCD) മാനേജ്മെന്റ് റെസിലൻസുമായി (പ്രതിരോധശേഷി) ബന്ധപ്പെട്ട സാധ്യതയുള്ള മാനദണ്ഡങ്ങൾ തിരിച്ചറിയുക..

ഞാൻ ബെങ്കിം. ബി. എ തിരുവനന്തപുരം ശ്രീചിത്ര തിരുനാൾ ഇൻസ്റ്റിട്ട്യൂട്ട് ഫോർ മെഡിക്കൽ സയൻസസ് ആൻഡ് ടെക്നോളജിക്ക് കീഴിലുള്ള അച്യുത മേനോൻ സെന്റർ ഫോർ ഹെൽത്ത് സയൻസ് സ്റ്റഡീസിൽ പൊതുജനാരോഗ്യത്തിൽ(MPH) അവസാന വർഷ പിജി വിദ്യാർഥിനിയാണ് ആലപ്പുഴ ജില്ലയിലെ വെള്ളപ്പൊക്ക സാധ്യതയുള്ള പ്രദേശങ്ങളിൽ സാംക്രമികമല്ലാത്ത രോഗം (NCD) മാനേജ്മെന്റ് റെസിലൻസുമായി (പ്രതിരോധശേഷി) ബന്ധപ്പെട്ട സാധ്യതയുള്ള മാനദണ്ഡങ്ങൾ തിരിച്ചറിയുക ' എന്ന എന്റെ ഗവേഷണ വിഷയവുമായി ബന്ധപ്പെട്ടു, ആലപ്പുഴ ജില്ലയിലെ വെള്ളപ്പൊക്കവും കടൽക്ഷോഭവും ഉള്ള പ്രദേശങ്ങളിൽ താമസിക്കുന്ന ആളുകൾക്കിടയിൽ ഫോക്കസ് ഗ്രൂപ്പ് ഡിസ്കഷൻ നടത്താനാണ് ഇവിടെ വന്നിട്ടുള്ളത്. വെള്ളപ്പൊക്കവും കടൽക്ഷോഭവും ഉള്ള പ്രദേശങ്ങളിലെ പഞ്ചായത്തുകളിലും ആരോഗ്യ കേന്ദ്രങ്ങളിലുമാണ് ഞാൻ പഠനം നടത്തുന്നത്. വെള്ളപ്പൊക്കത്തിനും കടൽക്ഷോഭത്തിനും സാധ്യതയുള്ളതിനാൽ ഞാൻ ഈ സ്ഥലം തിരഞ്ഞെടുത്തത്. സാംക്രമികമല്ലാത്ത രോഗം (NCD) അവസ്ഥയൽ നിങ്ങളുടെ പതിവ് പരിചരണത്തെക്കുറിച്ചും ചികിത്സയെക്കുറിച്ചും വെള്ളപ്പൊക്കത്തിലോ ഉയർന്ന മഴയിലോ ഉള്ള തയ്യാറെടുപ്പിനെക്കുറിച്ചും അറിയാൻ ഞാൻ ആഗ്രഹിക്കുന്നു. വെള്ളപ്പൊക്കത്തിന്റെയോ അതികഠിനമായ കാലാവസ്ഥയുടെയോ സാഹചര്യത്തിൽ എൻസിഡി മാനേജ്മെന്റിൽ നിങ്ങൾ അഭിമുഖീകരിക്കുന്ന നിങ്ങളുടെ അനുഭവങ്ങളെയും വെല്ലുവിളികളെയും കുറിച്ച് ഞാൻ നിങ്ങളോട് ചില ചോദ്യങ്ങൾ ചോദിക്കും.ഈ ചർച്ചയുടെ ദൈർഘ്യം 20-30 മിനിറ്റായിരിക്കും. നിങ്ങൾ എന്നോട് പങ്ക് വെച്ച ആശയങ്ങളൊന്നും തന്നെ നഷ്ടപ്പെടാതിരിക്കാൻ വേണ്ടി ഞാൻ ഈ സംഭാഷണം റെക്കോർഡ് ചെയ്തേക്കാം.

ഈ പഠനത്തിലെ പങ്കാളിത്തം തീർത്തും സ്വന്തം തീരുമാനപ്രകാരമായിരിക്കും. ഏതെങ്കിലും

ചോദ്യം നിങ്ങൾക്ക് അസ്വസ്ഥത ജനിപ്പിക്കുന്നുവെങ്കിൽ ആ ചോദ്യം വിട്ടുകളയാൻ നിങ്ങൾക്കെന്നോട് ആവശ്യപ്പെടാവുന്നതാണ്. സമ്മതം നൽകിയ ശേഷം പോലും ആവശ്യമെങ്കിൽ ഈ പഠനത്തിൽ നിന്നും പിന്മാറാൻ നിങ്ങൾക്ക് സ്വാതന്ത്രമുണ്ട്.

ഈ പഠനത്തിൽ നിന്നും നിങ്ങൾക്ക് നേരിട്ട് പ്രയോജനം ലഭിക്കില്ലെങ്കിലും, നിങ്ങൾ പങ്കിടുന്ന വിവരങ്ങൾ ദുരന്തനിവാരണത്തിനും ആരോഗ്യ സംവിധാനത്തിനുമുള്ള നയരൂപീകരണത്തിന് സഹായകമായേക്കാം.ചില ചോദ്യങ്ങൾ നിങ്ങൾക്ക് അസ്വസ്ഥത ജനിപ്പിച്ചേക്കാം എന്നതൊഴിച്ചാൽ മറ്റ് സാരമായ ദോഷങ്ങളൊന്നും തന്നെ ഈ പഠനം കൊണ്ട് ഉണ്ടാകാൻ സാധ്യതയില്ല.

നിങ്ങൾ നൽകുന്ന ശബ്ദരേഖ ആരുമായും പങ്ക് വെക്കപ്പെടുന്നതല്ല. നിങ്ങൾ പങ്ക് വെക്കുന്ന വിവരങ്ങളുടെ സ്വകാര്യത സംരക്ഷിക്കപ്പെടുമെന്നും അതിന്റെ ഒരു സംഗ്രഹം മാത്രമാണ് പഠനാവശ്യത്തിനും പ്രസിദ്ധീകരണത്തിനും ഉപയോഗിക്കുക എന്നും ഞാൻ നിങ്ങൾക്കുറപ്പ് തരുന്നു. നിങ്ങളുടെയോ നിങ്ങളുടെ സ്ഥാപനത്തിന്റെയോ പേര് റിപ്പോർട്ടിൽ ഉണ്ടായിരിക്കുന്നതല്ല.

കൂടുതൽ വിശദാംശങ്ങൾ ആവശ്യമുണ്ടെങ്കിൽ നിങ്ങൾക്ക് എന്നെയോ ഈ പഠനത്തിന്റെ അംഗീകാരം സംബന്ധിച്ചുള്ള വിവരങ്ങൾക്ക് ശ്രീചിത്രയുടെ ഇൻസ്റ്റിറ്റ്യൂഷണൽ എത്തിക്സ് കമ്മിറ്റിയുടെ മെമ്പർ സെക്രട്ടറിയെയോ നിങ്ങൾക്ക് ബന്ധപ്പെടാവുന്നതാണ്.

പ്രധാന ഗവേഷകൻ,

ബെങ്കിം. ബി. എ

MPH 2021,

AMCHSS, SCTIMST,

തിരുവനന്തപുരം

മെമ്പർ സെക്രട്ടറി

ANNEXURE III

IN-DEPTH INTERVIEW CHECKLIST

Grand tour questions:

1. **For how many years have you been living here?**
2. **Can you please explain about your NCD condition and how you are managing that?**

I) BEFORE FLOOD (prevention, mitigation, preparedness)

1. How did you come to know about your current disease condition? Did you have any kind of discomfort, or were you asked to go to a health centre by someone?

P1: is it by opportunistic screening. Or any camp or other regular screening activity by the government. (Amrutham Arogyam programme for above 30 people.

2.Do you know that the government have programme on non-communicable diseases (NCD) prevention and control in the state. (Like Amrutham Aarogyam)

P1: Ask about the any screening camps being conducted. Periodic screening?

P2: awareness about the disease, source of information complication of the disease condition, prevention and control measures

P3: from where to get help from when you find any difficulties.

P: prevention strategy by the patient.

3. How did you get detected (diagnosed) with the disease, form where you got diagnosed and by whom?

P1: Regular screening and detection camps.

4.What treatment are you taking, from where and how regular are you taking the treatment.

P1: is it from government institutions or private. If from private why?

5. For how many days do you get supply of medicine from health centre or are you depending on the private medical centres.

P1: ask about the source, availability of the medicine, how long do they stock medicine.

6. Are you aware of any regular medical clinics at the government health centre, that cater to your particular disease condition?

7. after you were identified with the disease condition, are you going for any regular check-up to the health centre or does the ASHA or JPHN visit your place? If, how often they visit you

P1: any interruption in supply of medicine.

8.What all type of medication you take on regular basis?

P1: availability of medicine at the health centre.

9. Do you get any kind of help or advice from ASHA, or any other health personals regarding the particular condition (if more than one condition ask for each one)?

P1: understand about their services.

P3: task sharing so health workers who are accessible to patients can distribute medications already prescribed by the medical officer, and patient-centred services that reduce the barriers to medication.

10. What are the measures and preparations taken by you prior to flood regarding NCD management?

II) DURING FLOOD.

1. Could you describe some of the difficulties you have faced regarding getting the treatment for your health condition (name of disease / ask for each condition if multiple) during the floods. Can you recall the 2018 flood and the one which happened on during the last monsoon.

P1: Does they pause for the period or discontinue.

P2: storage of medicine. availability of medicine, any difficulty in taking medicine.

P3: any kind of follow up by ASHA.

2.What kind of difficulties do you face during the flood with regard medication?

P1: availability of medicine, prescription, same medicine**.**

3.What kind of difficulties do you face during the flood with regard to diet and exercise?

P1: Ask about the flood relief camps, availability about the doctors, prescriptions, vaccine storage (insulin).

P2: ensure the regular and uninterrupted supply of quality-assured medications.

4. Can you recall any exacerbations at the relief camps?

P1: preparedness of the system.

III) POST FLOOD (response, recovery, reconstruction)

1. Did you face any health issues or discomfort after coming back from relief camp?

P1: Any kind of exacerbations, did you get back to normal after flood.

2. If yes how did you manage to overcome the situation back to normal routine.

P1: supply of regular medicine, system readiness, referral units etc,

3. Do you have a practice of having regular check-up at any health centre? When was the last time you had a check-up for your condition? If multiple then please ask for each.

4. Have you attended any government led clinics or monitoring after the flood?

P1: Monitoring and follow ups.

4. Do you face any other kind of difficulties in getting the medicine or taking the medicine?

P1: factors other than availability, prescription.

5. What are your suggestions and opinions about the NCD control and management by the health system, local self-government etc.

ANNEXURE IV

INFORMED CONSENT FORM FOR IDI (ENGLISH & MALAYALAM)

STUDY TOPIC: Understanding dimensions of resilience in non-communicable diseases (NCD) management among people living in a flood prone area of Alappuzha district, Kerala

- I, …… have read an understood all the information provided in the information sheet.
- I understand that my participation in this study is purely voluntary.
- By signing this sheet, I confirm my voluntary participation in this study.
- I understand that I can withdraw from this study during the discussion without any explanation.
- I have given consent for voice recording of this discussion. [YES/NO]
- I get that my identity and personal information will be kept confidential.
- I have been informed whom to be contacted for further information
- I agree to take part in this study.[YES/NO]

Name of the participant. Name of the PI

Signature. Signature

ANNEXURE V

സമ്മതപത്രം

പഠനവിഷയം: ആലപ്പുഴ ജില്ലയിലെ വെള്ളപ്പൊക്ക സാധ്യതയുള്ള പ്രദേശങ്ങളിൽ സാംക്രമികമല്ലാത്ത രോഗം (NCD) മാനേജ്മെന്റ് റെസിലൻസുമായി (പ്രതിരോധശേഷി) ബന്ധപ്പെട്ട സാധ്യതയുള്ള മാനദണ്ഡങ്ങൾ തിരിച്ചറിയുക.

- ഞാൻ,.....വിവരപ്പട്ടിക വായിക്കുകയും പൂർണമായും ബോധ്യപ്പെടുകയും ചെയ്തിട്ടുണ്ട്.
- ഈ പഠനത്തിൽ ഉള്ള എന്റെ പങ്കാളിത്തം പൂർണമായും സ്വന്തം ഇഷ്ടപ്രകാരമാണെന്ന് ഞാൻ മനസ്സിലാക്കുന്നു.
- ഈ ഷീറ്റിൽ ഒപ്പിടുന്നത് വഴി ഈ പഠനത്തിൽ എന്റെ പങ്കാളിത്തം ഞാൻ വ്യക്തമാക്കുന്നു.
- യാതൊരു വിശദീകരണവും കൂടാതെ ഈ ചർച്ചക്കിടക്ക് എനിക്ക് ഇതിൽ നിന്നും പിന്മാറാം എന്ന് ഞാൻ മനസ്സിലാക്കുന്നു.
- ഈ ചർച്ച റെക്കോർഡ് ചെയ്യാൻ ഞാൻ സമ്മതം നൽകിയിട്ടുണ്ട്.
- എന്റെ വ്യക്തിപരമായ വിശദാംശങ്ങളും സ്വകാര്യവിവരങ്ങളും രഹസ്യമായി സൂക്ഷിക്കപ്പെടുമെന്ന് ഞാൻ മനസ്സിലാക്കുന്നു.
- കൂടുതൽ വിവരങ്ങൾക്കായി ആരുമായി ബന്ധപ്പെടണം എന്ന് എനിക്ക് വിശദമാക്കി തന്നിട്ടുണ്ട്.
- ഈ പഠനത്തിൽ പങ്കെടുക്കാൻ ഞാൻ തയ്യാറാണ്.

പങ്കെടുക്കുന്ന വ്യക്തിയുടെ പേര് ഗവേഷകയുടെ പേര്

ഒപ്പ് ഒപ്പ്.

ANNEXURE VI

श्री चित्रा तिरुनाल आयुर्विज्ञान और प्रौद्योगिकी संस्थान, त्रिवेन्द्रम
तिरुवनन्तपुरम - ६९५०११, केरल, इंडिया
SREE CHITRA TIRUNAL INSTITUTE FOR MEDICAL SCIENCES AND TECHNOLOGY, TRIVANDRUM
Thiruvananthapuram - 695 011, Kerala, India
(An Institute of National Importance under Govt. of India)
Grams : Chitramet, Phone : +91-471-2443152, Fax : +91-471-2550728 / 2446433, E-mail : sct@sctimst.ac.in, Website : www.sctimst.ac.in

Institutional Ethics Committee

(IEC Regn No. ECR/189/Inst/KL/2013/RR-21)

SCT/IEC/2003/MARCH/2023 18.04.2023

Mr. Benkim BA
MPH Student, AMCHSS
SCTIMST, Thiruvananthapuram

Dear Mr. Benkim,

The Institutional Ethics Committee held on 18th March, 2023, reviewed and discussed your application to conduct the study titled "**UNDERSTANDING DIMENSIONS OF RESILIENCE IN NON-COMMUNICABLE DISEASES (NCD) MANAGEMENT AMONG PEOPLE LIVING IN FLOOD PRONE AREAS OF ALAPPUZHA DISTRICT, KERALA** (IEC/2003)".

The following members of the Ethics Committee were present at the meeting held on 18th March, 2023.

SL. No.	Member Name	Highest Degree	Gender	Scientific /Non Scientific	Affiliation with Institution(s)
1.	Smt. Sathi Nair	MA (English Literature)	Female	Lay Person	No
2.	Dr. Pradeep S	MBBS, MD	Male	Basic Medical Scientist	No
3.	Dr. Christina George	MD Psychiatry	Female	Clinician	No
4.	Dr. P. Manickam	BSMS, MSc (Epid).,PhD	Male	Health Science Expert/ Social Scientist	No
5.	Adv. Priya Kaimal	LLM, MBL	Female	Legal Expert	No
6.	Dr. Biju Soman	MBBS,MD, DPH, MSc, DLSHTM	Male	Basic Medical Scientist	Yes
7.	Dr. Syam K	MBBS, MD, DM	Male	Clinician	Yes
8.	Dr. Srinivas G	PhD	Male	Basic Medical Scientist (Member Secretary)	Yes

The following documents were reviewed:

Original submission

1. Covering letter addressed to the Chairman, IEC, SCTIMST dated 02.03.2023
2. Responses/Amendments made based on the Reviewer's comments
3. Checklist Form
4. IEC Application Form
5. Declaration Form
6. Research Proposal
7. Questionnaire in English and Malayalam
8. Participant Information Sheet and Consent Form in English and Malayalam
9. CV of Principal Investigator and Guide
10. SRC Recommendation letter

Revised submission

1. Covering letter addressed to the Chairman, IEC, SCTIMST dated 04.04.2023
2. *Copy of IEC Recommendation letter dated 03.04.2023*
3. Checklist Form
4. IEC Application Form
5. Declaration Form
6. Research Proposal
7. FGD Checklist in English and Malayalam
8. In-Depth Interview Checklist in English and Malayalam
9. Questionnaire in English and Malayalam
10. Participant Information Form and Informed Consent Form in English and Malayalam
11. CV of Principal Investigator and Guide

IEC Decision

The IEC approved the conduct of the study in the present form.

Remarks:
The Institutional Ethics Committee expects to be informed about the progress of the study, any SAE occurring in the course of the study, any changes in the protocol and patient information/informed consent and asks to be provided a copy of the final report.

There was no member of the study team / Guide who participated in voting / decision making process. The ethics committee is organized and operated according to the requirements of Good Clinical Practice and the requirements of the Indian Council of Medical Research (ICMR).

Sincerely,

Dr. G. Srinivas
Member Secretary, IEC

MEMBER SECRETARY
INSTITUTIONAL ETHICS COMMITTEE (IEC)
SCTIMST, THIRUVANANTHAPURAM

SREE CHITRA TIRUNAL INSTITUTE FOR MEDICAL SCIENCES & TECHNOLOGY
INSTITUTIONAL ETHICS COMMITTEE (IEC)
SCTIMST
THIRUVANANTHAPURAM

ANNEXURE VII

NATIONAL HEALTH MISSION
(Arogyakeralam Alappuzha) Register No.A-183/07
Office of The District Program Manager
Kottaram Building, General Hospital Compound
Iron Bridge PO, Alappuzha-688011, Phone: 0477- 2230711

No. DPMS 659/2023

Alappuzha,

09/05/2023

To

The Secretary,
Kainakary / Nedumudi / Ambalappuzha Panchayaths.

Sir,

Sub : Permission for study as part of MPH dissertation - Sri. Benkim.B.A - reg.

Ref:- Letter from Sree Chithira Tirunal Institute for Medical Sciences and Technology, Thiruvananthapuram dated 5.4.23

As per reference cited above, Sri. Benkim.B.A, a schlor in Master of Public Health Program would like to a study on the NCD Management. Please provide all the necessary support for him.

District Programme Manager,
NHM Alappuzha.

ANNEXURE VIII

Ouriginal

Document Information

Analyzed document	REPORT_PLAG_NCDFloods_MPH.docx (D171907181)
Submitted	2023-07-09 06:08:00
Submitted by	Rakhal Gationde
Submitter email	rakhal.gaitonde@sctimst.ac.in
Similarity	2%
Analysis address	gaitonde.rakhal.sctims@analysis.urkund.com

Sources included in the report

SA

70BB21A61025_FTR.pdf
Document 70BB21A61025_FTR.pdf (D171842684)
1

SA

Sree Chitra Tirunal Institute, Thiruvananthapuram / final_thesis_bala_20220709_v4.docx
Document final_thesis_bala_20220709_v4.docx (D141896383)
Submitted by: bijusoman@sctimst.ac.in
Receiver: bijusoman.sctims@analysis.urkund.com
2

SA

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Document 70BB21A61027_FTR.pdf (D171808990)
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MTP 1_FATHIMA NIDHA - for Urkundu.docx
Document MTP 1_FATHIMA NIDHA - for Urkundu.docx (D79378569)
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Sree Chitra Tirunal Institute, Thiruvananthapuram / Exploration of Social Innovation Ecosystems in Primary Health Care in Kerala An Application of Institutional Analysis Paradigm and Inclusiveness Assessment.docx
Document Exploration of Social Innovation Ecosystems in Primary Health Care in Kerala An Application of Institutional Analysis Paradigm and Inclusiveness Assessment.docx (D142035044)
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Receiver: ksrini.sctims@analysis.urkund.com
1