



भवानी प्रसाद खापुङ
Bhawani Prasad Khapung

स्वास्थ्य तथा जनसङ्ख्या राज्यमन्त्री
State Minister for
Health and Population



नेपाल सरकार
Government of Nepal

स्वास्थ्य तथा जनसङ्ख्या मन्त्रालय
Ministry of Health and Population



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MESSAGE

I am pleased to know that National Ayurveda Research and Training Center (NARTC), Kirtipur is going to publish Annual Report for the year 2020-21.

Ministry of Health and population of Nepal has always been optimistic and supportive in its task of research, training and health care service of NARTC since its establishment. Undoubtedly, NARTC has contributed various research and training activities in the development of Ayurveda health care system in Nepal.

I believe NARTC will conduct more innovative research and training activities for contributing towards the globalization of Ayurveda health services to people in its near future.

At last, I would like to congratulate whole team of NARTC for its achievement in this fiscal year.

Bhawani

Bhawani Prasad Khapung
State minister

(Hon. Bhawani Prasad Khapung)
State Minister



Government of Nepal
Ministry of Health & Population



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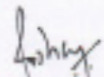
**Ramshahpath, Kathmandu
Nepal**

Ref.:

Date :



It is an immense pleasure to know that National Ayurveda Research and Training Center, Kirtipur is due to publish Annual Report for the year 2077-78. My heartily congratulations goes to the whole team and Executive Director of the center for the successful completion in this fiscal year. It is without doubt NARTC has done its level best to achieve its missions and goals even in this global pandemic due to COVID -19. Ministry of Health and Population is very optimistic about this national Institution. It has been entrusted with the task of research, training and health care service of Ayurveda medicine. I believe that the strategies and planning carried out by this institution will contribute in the development of Ayurveda health care system in the country. Ministry of Health and population of Nepal have always been optimistic and supportive in its task of research, training and health care service of NARTC since its establishment. Undoubtedly, NARTC has contributed various research and training activities in the development of Ayurveda health care system in Nepal. Last but not the least; I would like to thank National Ayurveda Research and Training Center team for successful completion of this fiscal year achieving all its goals, and I'm confident it will continue to do so in coming years.


Dr. Roshan Pokhrel
Secretary

Executive Summary

National Ayurveda Research and Training Center (NARTC) is a pioneer institution for advancing research, conducting training and providing health care services in Nepal. NARTC is mainly focused as a national level apex body for effective development and promotion of Ayurveda since its establishment. For such, it has been conducting various types of research activities in Ayurveda so that we can generate scientific evidences in regards to Ayurveda treatment modality in the present era.

This fiscal year, along with antimicrobial and phytochemical analysis, we have stepped further into animal model research where the hypoglycemic activity of *Clerodendrum Infortunatum* was studied in diabetic rats and the results were promising. This definitely has made a new paradigm shift in understanding anti-diabetic properties of such herbs. NARTC is very hopeful to develop anti-microbial agents using Ayurvedic formulation in the near future.

NARTC has also conducted an epidemiological research in finding out the prevalence of anorectal disorders in Kirtipur Municipality for the first time in Nepal. Also effect of *Gymnema sylvestra* in patients with diabetes mellitus was studied as part of the clinical research. Through this research, we are able to spread awareness, prevention, cure and future consequences of the diseases in the general population.

As a national level healthcare institution, NARTC has always been responsible towards healthcare challenges that the country may face. During the COVID-19 pandemic, NARTC proudly welcomed and fulfilled its responsibility for the society admitting suspected cases of TUTH probably being exposed to Nepal's first COVID-19 case. Since then, NARTC has been providing effective services to COVID-19 patients. There is ongoing research to evaluate symptoms in COVID-19 patients and to find out the effectiveness of Ayurvedic herbo-mineral preparation in COVID-19 patients at NARTC.

In this fiscal year, we have started micro-propagation of high value medicinal plants. With establishment of PTC; we aim to distribute these valuable plants for the farmer helping them to improve their socio-economic status.

In regards to training, NARTC has conducted different training programs

for skill enhancement of Ayurvedic doctors, health workers and paramedics in this fiscal year. NARTC has continued training and workshop in Marma Chikitsa to propagate the hidden knowledge of Ayurveda for the first time in Nepal. Basic Training and Workshop on Panchakarma Chikitsa, Basic Training and Workshop on Marma and Yoga Therapy, and Basic Training and Workshop on Kshar-Sutra Chikitsa.

In health care services, we have been providing state of the art services in the field of Ayurveda in NARTC's hospital. We serviced and treated patients at OPD and 25 bed IPD. This institution is also emerging as a center for excellence in the management of ano-rectal disease by Kshar-sutra method and other metabolic diseases by Panchakarma therapy.

Among the seven provinces of Nepal, NARTC already had already established its branches in Province 1, Madesh Province and Gandaki Province. This fiscal year NARTC has inaugurated a new branch in Nuwakot district of Bagmati Province. This branch has been in service since Falgun 29, 2077 BS.

We are always aware about opportunities and challenges of the institution. NARTC is very much committed to tackle all the challenges and contribute to development of Ayurveda.

At last but not the least, I would like to thank all the doctors, research officers, training officer, administrative staffs and all the family of NARTC for their support and cooperation to continue in the service of Nepal.



.....
Dr. Ram Adhar Yadav

Executive Director,

National Ayurveda Research and Training Center,

Kirtipur, Kathmandu, Nepal

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OVERVIEW

Historical Background

National Ayurveda Research and Training Center (NARTC), under the Ministry of Health and Population, Government of Nepal is an autonomous body primarily working in the field of Ayurveda research, healthcare and capacity building. NARTC was established as a national level apex body for effective development and promotion of Ayurveda as a model institute for advancing research, training and patient care by Ayurveda system of medicine. The NARTC project began since the month of November 2003 when the Government of Nepal proposed to the Government of the People's Republic of China for the unequivocal necessity of NARTC project in Nepal. Under the joint efforts and friendly cooperation between the nations, both the nations officially agreed to implement NARTC project on August 16, 2004. The Government of the People's Republic of China and the Ministry of Health and Population of the Government of Nepal authorized China Jiangxi Cooperation for International and Technical Cooperation to build the project of NARTC on September 21, 2008. The project was commenced on February 20, 2009 and the Government of the People's Republic of China handed NARTC over to Government of Nepal on April 3, 2011. For further enhancement of NARTC, the Government of the People's Republic of China aided medical and training equipment with the value of RMB Yuan 15,400,000/- (RMB Yuan Fifteen Million and Four Hundred Thousands Only) in accordance with the provision of the letters exchanged on August 18 and August 24, 2014 between the nations. The Government of the People's Republic of China officially handed over the equipment to the Government of Nepal on May 11, 2016. In addition to this, Chinese technical team also supported installment of equipment at NARTC. Under Development Committee Act, NARTC was in operation from February 12, 2012 till July 16, 2019.

Location

NARTC is located just outside the premises of Tribhuvan University, Kirtipur with an area of 19482.4 m² (30 Ropanies). The organization has three major blocks namely Research Hospital block, Research block and Training block. Another four small buildings are designated as animal house, generator and water equipment house, and waste management and cafeteria buildings. Building construction occupied 34563 m² (17.7%) area of the territory of NARTC.

Vision

- The major vision envisaged for the NARTC is to promote research and training activities for contributing towards the globalization of Ayurveda system of Medicine and for providing evidence based quality Ayurveda health services to people.

Mission

- Support and conduct ethical research in Ayurveda.
- Train and provide skilled manpower in field of Ayurveda.
- Implement evidence based research in treatment to the patient care activities to validate Ayurvedic treatment.
- Advocate and disseminate knowledge of Ayurveda research for the welfare of mankind.

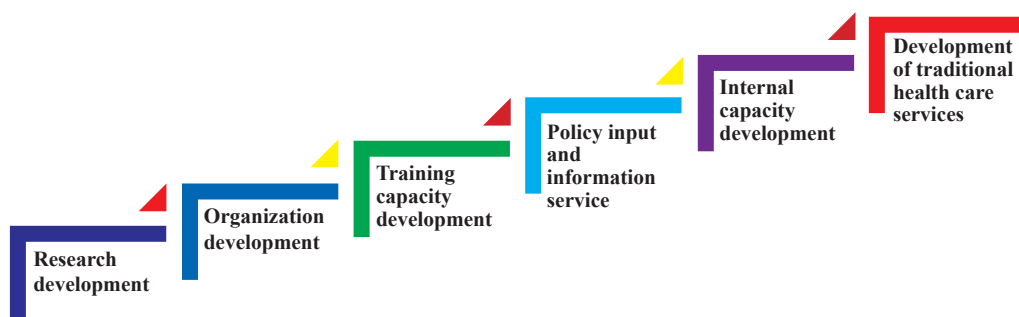
Objectives

- To protect, preserve, develop and commercially utilize medicinal and aromatic plants (MAPs) and natural resources to meet the WTO (World Trade Organization), TRIP (Trade-Related Aspects of Intellectual Property Rights) and IPRs (Intellectual Property Rights).
- To build linkages with different institutions and entrepreneurs inside and outside the country.
- To develop appropriate technology and transfer of technology and skill up to the grass root level for the conservation, cultivation and capitalization of medicinal plants.
- To develop inventive and innovative steps for development of drugs and clinical practices.

- To initiate and promote research and good practices applied in production, manufacture and supply of Ayurveda and herbal drugs.
- To provide necessary training for the employees of government and non-government Ayurveda institutions and its related human resources.
- To identify measures for enhancing the capacity of developing programs in farming and processing of Medicinal and Aromatic plants.
- To conduct national and international meetings/seminars/conferences.

Strategies

- In order to perform institutional roles and undertake necessary activities following strategies goals have been visualized:



I: Research

1. Contribution in life-science research based on Ayurveda principles
2. Delivering modern research techniques based on Ayurveda guidelines.
3. Delivering information about research, training and health care service.
4. Generating revised evidences for Ayurveda healthcare system in Nepal

II: Training

1. Delivering and improving training services.
2. Developing researches, trainers and experts.
3. Developing capacity building and strengthening professional related governmental and non-government organizations.

III: Health Care Services

1. Strengthening Ayurveda healthcare system of Nepal.
2. Popularizing Ayurveda system of medicine.
3. Contributing in evidence based health care services.

IV: Internal Capacity Development

1. Capacity building within the organization in various related sectors for better output of the organization as a whole.
2. Developing internal organizational and management capacity through various training and capacity building sessions within and outside the institution

V: Policy Input and Information Services

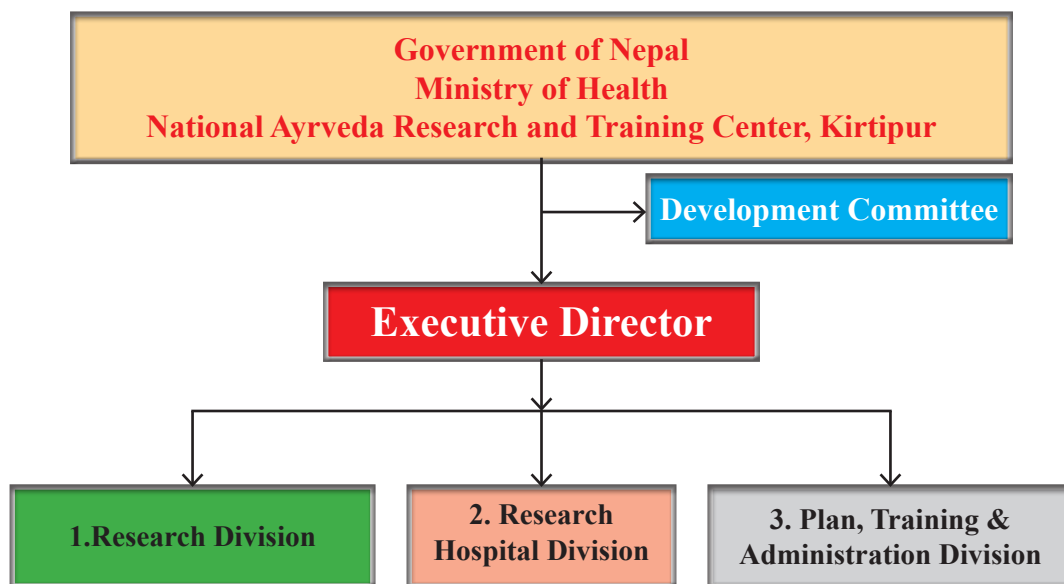
1. Maintain collaboration with existing stake holders, while promoting linkages with new institutions with similar goals and objectives.

Organization structure

The organizational structure of NARTC has been set up under Development Board Act of Government of Nepal. It is an autonomous institution under Ministry of Health and Population, Nepal. Development Committee of the center delivers policy, approves programs and reviews progress. The Executive Director of NARTC is responsible for overall management of the organization. The heads of the NARTC divisions are responsible for the day to day functioning of their respective divisions. The organization set up of NARTC is depicted under three divisions:

- Research Hospital Division
- Research Division
- Plan, Training and Administration Division.

Organogram



Provincial Branches of NARTC

Among the seven provinces of Nepal, NARTC already has established its branches in Province 1, Madesh Province and Gandaki Province. This fiscal year NARTC has inaugurated a new branch in Nuwakot district of Bagmati Province. This branch has been in service since Falgun 29, 2077 BS.

Below is the list of branches currently in service.

- Province 1, Laukahi, Sunsari
- Madesh Province, Bardibas, Mahottari
- Bagmati Province, Nuwakot, Belkotgadhi
- Gandaki Province, Siranchowk, Gorkha



The Institutional Review Committee (IRC)

The Institutional Review Committee (IRC) of NARTC reviews proposed studies to ensure that it follows internationally and locally accepted ethical guidelines. They monitor studies once they have begun and, where relevant, take part in follow-up action and surveillance after the end of the research. The committee has the authority to approve, reject or stop study or require modification to research protocols.

Objective:

- To promote high ethical standards in research for health.

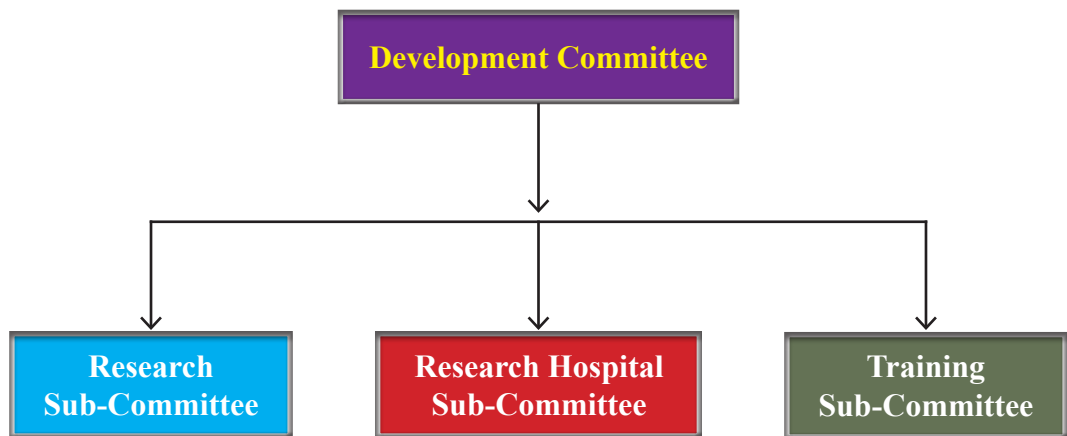
Functions

- To set policies or offer opinions on ongoing ethical issues in research.
- To review international ethical standards governing research involving human participants, as well as by local law in many jurisdictions.
- To review required laws of the country in which the research is being sponsored, even if it is not required by the host country's own laws.
- To review to publish the results of their investigation, as most medical journals will not publish the results of research that has not received the approval of a research ethics committee.
- To protect potential participants in the research.
- To take into account potential risks and benefits for the community in which the research will be carried out.

Sub-committees

NARTC has set up its experts committee for research, training and health care services. Highly experienced academic professionals are the members of sub-committee. The sub-committee members provide guidance and valuable suggestion in executing and implementing activities or programs in respective services. The three sub-committees at NARTC are:

- Research sub-committee
- Training sub-committee
- Hospital management sub-committee



Research sub-committee

Research sub-committee is organized to review intramural as well as collaborative research projects of NARTC. The committee critically reviews the research projects and recommends the research proposal for grant. The committee also plays vital role in disseminating information of the research result.

Objective

- To prioritize research area, evaluate research proposals and recommend for grant.

Function

- To prioritize research area
- To select topics for research
- To review technical proposal
- To evaluate proposal
- To recommend for grant
- To disseminate the research
- To finalize the research report
- To recommend publication of the research report

Training sub-committee

This sub-committee overviews all the training activities/programs conducted by NARTC. It prioritizes training subjects, develops curriculum and recommends for conduction of training.

Objective

- To prioritize training area, develops training curriculum and recommends implementing training.

Function

- To prioritize training area
- To select topics for training
- To develop training curriculum
- To recommend conducting training
- To advise for further improvement

Hospital management sub-committee

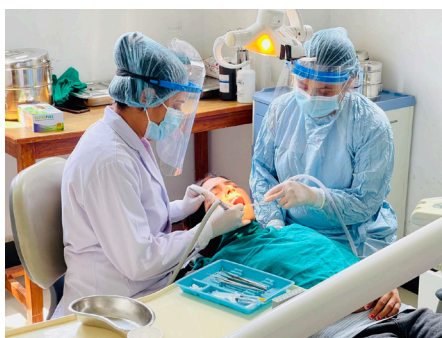
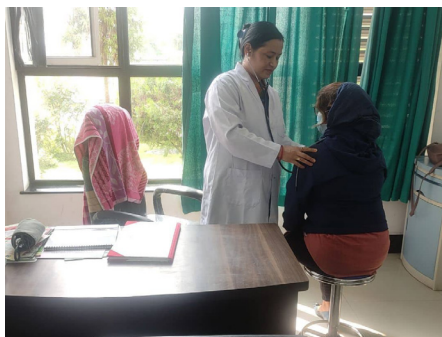
This sub-committee generates advice for managing hospital smoothly. It prioritizes health care services and fixes fee. It also suggests recruiting required human resources installing of instruments, monitoring and evaluation of health care services.

Objective

- To manage health care services, fixes fee and recommends further projects for health care services

Function

- To manage health care services
- To fix fee of the services



- To contribute in clinical research
- To recommend health care projects
- To advise for further improvement

Program and Services

I. Research Hospital

Research based health services in OPD/IPDs are:

- Kaya Chikitsa (Internal Medicine)
- Shalya (Surgery)
- Shalakya (ENT)
- Stri-Prasuti (Gynaecological and Obstetrics)
- Arbuda (Oncology)
- Danta (Dental)

Special Services:

- Panchakarma Therapy
- Ksharsutra
- Acupuncture
- Therapeutic Yoga
- Physiotherapy
- Agnikarma Therapy
- Marma Therapy

Other services are:

- Clinical Pathology
- Ultrasonography



- X-ray
- CT scan
- EEG/ECG
- Endoscopy/colonoscopy
- Pharmacy



Current services in the laboratory

Biochemistry	Serology	Hematology	Others
Glucose	ASO Titre	CBC	Stool R/M
Uric acid	CRP (Qualitative)	ESR	Urine R/M
RFT	CRP (Quantitative)	CT/BT	Occult Blood
LFT	RA Factor	Reticulocyte count	
Lipid Profile	Widal Test	Kala azar	
Calcium	HIV 1& 2	Malaria	
Phosphorus	HBsAg	HbA1C	
Total Protein	HCV	D-Dimer	
Serum albumin	VDRL		
	H. Pylori		
	TPHA		
	Blood Grouping		



II. Research section

Currently running as well as perspective researches in NARTC are based on following fundamentals.

- Clinical research primarily focused on non-communicable disease
- Drug Research
- Drug Standardization
- Pre-clinical Research / Pharmacological Research
- Medicinal Plant Research (Medico-Ethno Botanical Research, Pharmacognosy)
- Literary Research & Documentation
- Toxicology
- Nutrition



Research units in NARTC:

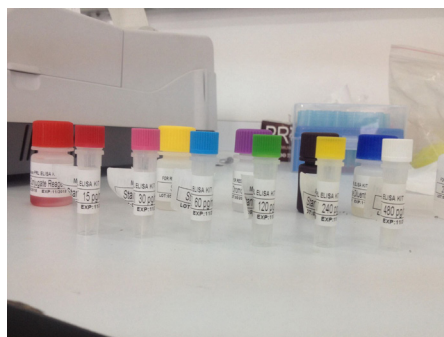
Microbiology laboratory

- Evaluation of microbial contamination in drug formulations.
- Study activities of herbal plants against pathogenic micro-organisms.
- Antimicrobial activity of indigenous plants of Nepal
- Isolation of enzyme from bacterial culture.
- Preservation of bacterial strains.
- Tests for specified micro-organisms i.e. *Escherichia coli*, *Staphylococcus aureus*, *Bacillus subtilis*, *Klebsiella pneumoniae* etc.
- Finding role of Ayurveda drugs in the treatment of various diseases



Molecular biology laboratory

- Isolation of plant DNA for digital library such as DNA barcoding.
- Preparation of DNA samples using PCR tools for further studies including sequencing.
- Isolation and characterization of bacterial DNA
- Molecular diagnosis of diseases



Immunology laboratory

- Quantification of hormonal changes during animal model trials of various drugs
- Quantification and analysis of toxic substances
- Disease diagnosis using ELISA
- Disease diagnosis using CLIA
- In-vitro assay for toxicity of various compounds



Instrumental analysis laboratory

- Chromatographic techniques for separation and analysis of samples.
- Separation of plant product on the basis of polarity, volatility and so on
- Standardization of Ayurveda medicines
- Determination of Dissolution, hardness, total ash, alcohol, extractive values, water soluble extractive, moisture content etc.
- Determination of Refractive index, Specific gravity, Determination of pH values, Determination of melting range and boiling range.



- Determination of viscosity, Determination of saponification, iodine & acid values
- Determination of peroxide value, Determination of alcohol content

Animal/Clinical trials

- Animal breeding, intervention and study of effects of various drugs.
- Development of histopathological laboratory.
- Development and evaluation of a novel drug delivery system of medicinal plant in Nepal
- Development of clinical trials of related diseases



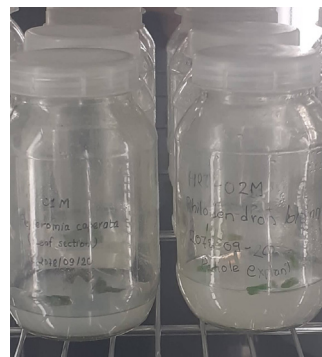
Phytochemical Analysis Laboratory

- Hot and cold extraction of plant parts using various solvents.
- Concentration of extracts using rotary evaporator.
- Quantitative phytochemical analysis of Proteins & Amino acids, Carbohydrates, Glycosides, Phytosterols & Triterpenoids, Tannins, Flavanoids, Saponins, Alkaloids, and Fats & Fixed oils
- Determination of Total Ash, Determination of Acid Insoluble Ash, Determination of Water Soluble Ash, Determination of Sulphated Ash
- Determination of Alcohol Soluble Extractive, Determination of Water Soluble Extractive
- Determination of Ether Soluble Extractive (Fixed Oil Content)
- Determination of Moisture Content (Loss on Drying)
- Determination of Volatile Oil in Drugs



Plant tissue culture

- Micro-propagation of medicinal plants of high commercial values.
- Growing endangered medicinal plants of Nepal in a controlled environment.
- Production of medicinal plants for commercial benefits as well as for research.



III. Training section

- Training on skilled development
- Strengthen and capacity building of respective professionals
- Improving capabilities of individual working at different levels of Ayurveda



IV. Other facilities

➤ Herbarium/ Crude Drug's Library

NARTC has developed its crude drug museum with more than 300 crude drugs. Crude drugs and medicinal plant species are collected from various parts of Nepal in appropriate time of the year and from appropriate altitudes. They are stored at dry and clean environment for further research and sampling purposes.



➤ Library

The library is an air-conditioned room with wi-fi internet connection. The library has books and photocopy references on ayurveda, allopathy, sanskrit, science etc. Rare and reference books are also kept separately. The library has started to collect research thesis by NARTC. Automation of library work is in progress and in near future it will digitalize.



➤ Conference and Training Hall

NARTC has an air-conditioned training hall with a capacity of 50, built with all facilities for conducting training activities. Training hall of NARTC is in good amenity. This is being used for training activities and seminars.

Collaboration and linkage

NARTC is mainly research and training based institution. It has linked up with national and international research and training organizations.

Some of the national and international organizations are:

- Nepal Health Research Council, Ramshah Path, Kathmandu
- Ayurveda Campus & Teaching Hospital, Kirtipur, Kathmandu
- B.P.Koirala Cancer Hospital, Bharatpur, Chitwan
- China Academy of Chinese Medical Sciences, Beijing, China
- Hebei Research Institute, Hebei, China



Highlights of Work Progress in FY 2078/79

A. HEALTH CARE ACTIVITIES

Research Hospital

NARTC has its own research hospital with a bed capacity of 31 for indoor patient department (IPD) and provides outdoor patient department (OPD) services as well. The main objective of the hospital is to provide evidence based medical care through Ayurveda system of medicine to the patients. It prioritizes clinical research along with patient care through its OPD, IPD, panchakarma therapy, ksharsutra, acupuncture, therapeutic yoga, physiotherapy, clinical pathology, ultrasonography, X-ray, CT scan, EEG/ECG, endoscopy/colonoscopy and pharmacy. Special treatment facilities are available for anorectal disorders, cancers, rheumatology and endocrinology. Registration is free in the hospital for senior citizens and patients who participate in intramural clinical research. Most of the medicines dispensed for intramural clinical research are manufactured in the pharmacy of NARTC and are provided for the patients free of cost. Health care services are 50 percent discount for the residents of Kirtipur Municipality and senior citizens.

Outpatient Department(OPD)

In the fiscal year 2077/78 a total of 8420 patients visited the NARTC which includes new cases and follow up cases attended in Outpatient department (OPD) of Kayachikitsa, Shalya, Accupuncture and Dental. (Table 1).

Table 1: Frequency of patients visited NARTC in the year 2077/78

Service	Frequency
Total patients/cases	8420
New cases	2213
Follow up cases	1884
Kaya Chikitsa (I & II) OPD	2246
Shalya OPD	793
Acupuncture OPD	1022
Dental	262

Similarly, Figure 1 represents the frequency of patients who received the available services at NARTC. Among the services, the maximum patients i.e. 1377 received laboratory services, followed by 1022 patients of acupuncture therapy, 393 patients of Radiology & imaging, 382 patients of physiotherapy, 382 cases, 262 patients of dental service and 255 patients received panchakarma services.

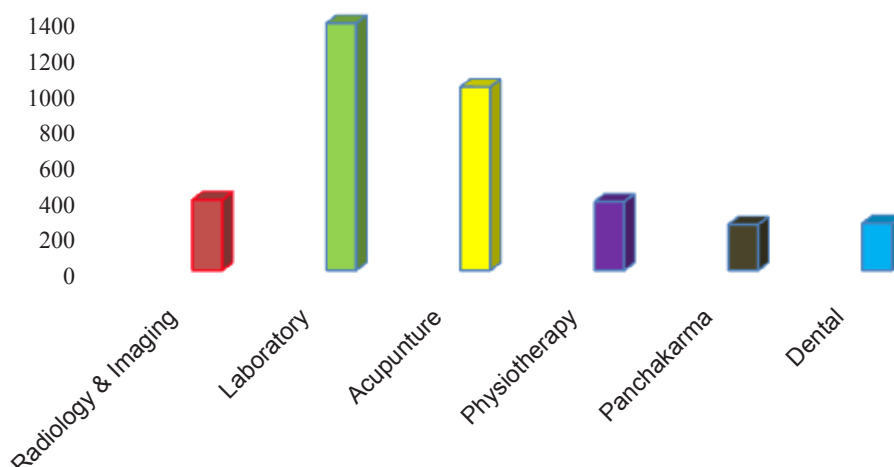


Figure 1: Frequency of patients receiving different services at NARTC in fiscal year 2077/78

Pathological Services

In the year 2077/78 we received 1377 routine test samples in the Pathology laboratory of NARTC consisting 491 biochemistry tests, 423 hematology, 289 serological and 174 parasitology tests (Figure 2). The received test samples include blood, urine and stool specimens.

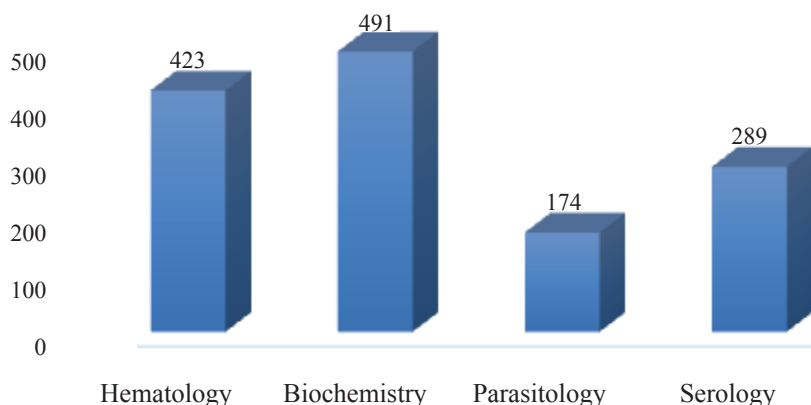


Figure 2: Distribution of routine tests in pathology laboratory, NARTC

Inpatient Department (IPD)

The total bed capacity for IPD is 31 beds. During the year under report, the total patients treated in IPD were 22. The effect of COVID-19 directly reflected in the flow of patients getting admitted for treatment. Compared to last year of 247 patients being admitted in IPD, a decrease of 91% followed up this year.

B. RESEARCH ACTIVITIES

Medicinal Plant Research

- i. *An Assessment of Antioxidant, Antimicrobial and Anti-Inflammatory Activity of Five Folklore Medicinal Plants Used By Traditional Healers in Nepal*

Research Summary

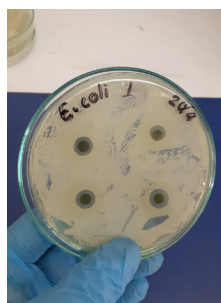
Anti-inflammatory Activity:

The mechanism involves in the inflammation such as the release of histamine, bradykinin, and PGs in much inflammatory condition. COX-2 selective inhibitor is a form of non-steroidal anti-inflammatory drug that directly targets COX-2. To investigate the Anti-inflammatory effect of the herb, Sprague Dawley rats (175-200 gm) were selected. The joint of right hind legs of all rats were marked and placed in plethysmometer. The inflammatory response was induced by sub plantar injection of 0.1 ml of 1% (w/v) sterile carrageenan in saline into the right hind paw of rat. Plant extract were administered orally via feeding tubes 1 hour prior to carrageenan administration. The inflammation index was calculated as the difference between the volumes of the injected paws.



Antioxidant activity:

A majority of antioxidants naturally present in foods occur in phenolic structures and especially in flavonoid structures. Free radical scavenging activities of solutions of the plant extracts and synthetic antioxidant substances were prepared in methanol at concentrations of 50, 100 and 200 µg/mL, which is based on the principle of scavenging the DPPH (1,1-diphenyl-2-picrylhydrazyl) radical. DPPH was added to the solutions prepared with plant extracts and standard antioxidant substances and stirred. Each mixture was kept in the dark for 30 min and the absorbance was measured at 517 nm against a blank.



Antimicrobial assay:

Antibacterial test by agar well diffusion method Antibacterial activity tests measure the ability of an antibacterial agent to inhibit bacterial growth in vitro. In agar well diffusion method, small cups (wells) were made by cork-borer in the petri-plate containing the required medium, already inoculated by test organism. The diluted extract is added to the well. After incubation, the diameter of the zones of complete inhibition was measured (including the diameter of the disc) and recorded it in millimeters. The measurements were done with a ruler on the undersurface of the plate without opening the lid.

Objectives:

General:

- An Assessment of Antioxidant, antimicrobial and anti-inflammatory activity of five folklore medicinal plants used by traditional healers in Nepal

Specific:

- Sample collection, identification and preparation of folklore medicinal plants

-
- Study of anti-inflammatory activity in vivo.
 - Study of antioxidant activity in vitro
 - Study of antimicrobial activity

Rationale:

- No systematized scientific proof justification about the uses of folklore medicinal plant.
 - Even though Nepal is rich in possibly high potent medicinal plant, proper study and characterization has not been done in adequate level.
- ii. *Hypoglycemic Activity of Clerodendrum Infortunatum (Bhandir) Leaves in Alloxan Induced Diabetes Sprague Dawley Rats.*

Objectives:

General:

- To evaluate the hypoglycemic activity of Clerodendrum infortunatum (Bhandir) leaves in alloxan induced diabetic rats.

Specific:

- To collect, identify and authenticate Clerodendrum infortunatum (Bhandir)
- To determine Physiochemical and estimation of active constituents of Clerodendrum infortunatum (Bhandir) leaves
- To evaluate the hypoglycemic activity of alcoholic and aqueous extract of Clerodendrum infortunatum (Bhandir) in diabetes induced rats.
- To assess the abnormal lipid metabolism in diabetes induced rats.

Rationale:

- Modern understanding of phytochemical is limited due to which various medicinal plants are yet to be researched. Researches on plant help us on development and identification of metabolites that could be used for prevention and treatment of diseases.

Induction of experimental diabetes with Alloxan:

Rats to be induced with diabetes are fasted overnight for 12 hours. Solution of alloxan monohydrate of dose 90mg/kg was injected intraperitoneal. After injecting alloxan solution intraperitoneally they were fed 5 ml of 10% glucose solution to overcome death resulted from compensatory hypoglycemic shock. Animals with random glucose level greater than 140mg/dl after 24-48 hours of administration of alloxan monohydrate were considered to be diabetic and study was continued.

Blood Sample collection:

Fast blood glucose level of rat was determined before the start of the experiment as baseline level. Then the Blood samples were collected at 0, 1, 3, 7, 14 and 21 days from tail vein puncture till the end of the study. On day 21 bloods was collected by cardiac puncture under mild anesthesia (isoflurane) from overnight fasted rat. Clear supernatant serum was prepared in eppendorf tube for analysis of various biochemical parameters.

Biochemical Analysis:

Fasting glucose level (by GOD-POD method), serum Total cholesterol (Cholesterol oxidase method) high-density lipoprotein (HDL) and triglycerides (TG) were measured using commercial kits in spectrophotometer. Serum Insulin, C-peptide levels will be measured with Insulin mouse ELISA kit in Mindray ELISA reader.



Epidemiological Research

- i. The Prevalence of Anorectal Disorders among Residents of Kirtipur Municipality in Nepal

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The Prevalence of Anorectal Disorders among Residents of Kirtipur Municipality in Nepal

Ram Adhar Yadav, Sirjana Shrestha, Jitendra Shrestha, Amit Man Joshi*

National Ayurveda Research and Training Center, Kirtipur, Nepal

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Abstract

Background: Epidemiological knowledge is very poor in regards to anorectal disorders. The patients do not often discuss perianal symptoms leading to late diagnosis and treatment. There is a need of doing systematic questioning and clinical evaluation of the population to assess the prevalence of anorectal disorders.

Aim and objectives: The aim of this study is to assess the prevalence of anorectal disorders among the residents of Kirtipur municipality in Nepal.

Methods: The first section was the cross-sectional survey to assess the demographic and lifestyle characteristics of the study population. The second section was the observation study to assess the prevalence of anorectal symptoms. 1483 patients were recruited from 10 wards of Kirtipur municipality. We analyzed the comparison of diagnostic approach between patients with perianal symptoms spontaneously visited and those revealed after targeted questioning. We further analyzed the reason for not performing perianal examination by both patients and general practitioners. Factors associated with referral to a proctologist and diagnosis rate were also evaluated.

Results: The study showed that the prevalence of anorectal symptoms increased from 9.4% to 21.2% after systematic targeted questioning by general practitioners. Spice intake was the only covariate associated with decrease risk of proctological symptoms. Haemorrhoids (31.2%) and anal fissure (28.7%) were the most prevalent anorectal disorders. However, physicians have diagnosed anorectal disorders in 20.2% of patients without performing any perianal examination. Diagnosis of haemorrhoids and fistula in ano were significantly associated with referral to a proctologist.

Conclusion: This study may contribute to epidemiological knowledge about the prevalence of anorectal disorders among Nepalese population.

Keywords: Anorectal disorders; Prevalence; Nepal

Abbreviations

NARTC: National Ayurveda Research and Training Center; CI: Confidence Interval; OR: Odds Ratio; SPSS: Statistical Package for Social Sciences; ENT: Ear: Nose and Throat; VDC: Village Development Committee.

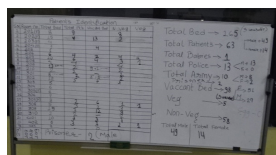
ii. Impact of the COVID-19 Pandemic on Mental Health and Quality of Life among Nepalese People

ABSTRACT

Introduction: Mental health is a very important component of overall health especially in the pandemic period of present global scenario. It is very important to know how the population of any country are dealing with this COVID-19 pandemic. In the context of Nepal, being an developing country with minimum per capita income, it is further more important to understand how the population is coping with this global pandemic condition.

Methodology: A survey was performed through phone call from July 2020 until September 2020. Only adults (aged 18-70 years) of Nepalese nationality admitted in the isolation ward of National Ayurveda Research and Training Center (NARTC) who provided verbal informed consent were recruited in the study using convenience and snowball sampling methods. Participants completed a modified validated questionnaire that assessed the indicators of negative mental health impacts, social and family support, and mental health-related lifestyle changes.

Results: Total 463 participants were enrolled for the study. Among them 69.1% were male and 30.9% were female. The mean age of participants was 31.9 ± 10.6 and more than half of the participants (58.5%) were aged between 18 and 30 years. Only 10.4% participants reported increased stress from work. And 12.5% participants mentioned increased financial stress during the pandemic. A total of 10.6% participants reported that they felt extreme fear. Only 3% felt helpless and 8.6% of the participants felt hopeless. Only 16.4% received increased support from friends. The COVID-19 pandemic was associated with very mild stressful impact in our sample; since the COVID-19 pandemic is still ongoing, these findings need to be confirmed and investigated in future larger population studies.



- i. Effect of *Gymnema sylvestre* (Gurmar) in Patients Diagnosed with Type 2 Diabetes mellitus in Kathmandu Valley



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ORIGINAL RESEARCH ARTICLE

Effect of *Gymnema sylvestre* (Gurmar) in Patients Diagnosed with Type 2 Diabetes mellitus in Kathmandu Valley

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Co Authors: Sirjana Shrestha², Ram Adhar Yadav³, Ruby Bajracharya⁴ and Jitendra Shrestha⁵

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ABSTRACT

Introduction:

Diabetes mellitus is a growing public health concern in the Southeast Asia region (SEAR), where more than 87.6 million people are living with diabetes. *Gymnema sylvestre* (Gurmar), a medicinal herb, is commonly used as herbal medicine to treat diabetes.

Objectives:

The present study was aimed to examine the effect of *Gymnema sylvestre* (*G. sylvestre*) among patients diagnosed with Type 2 Diabetes mellitus (T2DM) in Nepal.

Materials and Methods: The present study was an open-label uncontrolled clinical trial. Eligible participants were patients aged 30 to 60 years and diagnosed with T2DM. A total of 43 eligible participants were supplemented with 6 gm of *G. sylvestre*, daily for 4 weeks during the study period. Anthropometric and biochemical variables were evaluated by comparing data at baseline and at 4 weeks after starting treatment using chi-square and student's *t*-test.

Results:

There was a decrease in the fasting and post-prandial glucose levels of the participants by 19.3% and 16.7%, after treatment with *G. sylvestre*, respectively. There were no significant changes observed in other clinical variables before and after treatment with *G. sylvestre*.

Conclusion:

This study suggests that the use of *G. sylvestre* leaf has a potential hypoglycemic action in patients with T2DM. However, further studies are needed to confirm the beneficial effect of *G. sylvestre* in T2DM.

Key Words: *Gymnema sylvestre*, Type 2 Diabetes mellitus, Nepal

INTRODUCTION

Diabetes mellitus is a growing public health concern in the Southeast Asia region (SEAR),

where more than 87.6 million people are living with diabetes¹. South Asians are known to have an increased predisposition for Type 2 Diabetes

ii. Efficacy of Ayurvedic herbal formulation and Ayurvedic herbo-mineral formulation in hypothyroidism patients

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Efficacy of Ayurvedic herbal formulation and Ayurvedic herbo-mineral formulation in hypothyroidism patients

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ABSTRACT

Background: Hypothyroidism is one of the major endocrine disorders seen in general population worldwide. Although modern drugs are quite effective in managing hypothyroidism, it is subject to sustaining certain side effects. So, we aim to evaluate the efficacy of Ayurvedic herbal formulation and Ayurvedic herbo-mineral formulation in managing hypothyroidism in Nepalese population. **Methods and analysis:** This study was a randomized, double-blind, and controlled trial. A total of 50 participants with the diagnosis of hypothyroidism was randomly assigned to the intervention group or control group in a ratio of 1:1 for 4 weeks. The primary outcome measure was the thyroid-stimulating hormone level, and secondary outcome measures was the change in body mass index, waist-hip ratio, blood glucose level, lipid profile, liver function tests and renal function tests between the baseline and at 4 weeks after intervention. Statistical analysis was done by comparing categorical variables using chi-square test and Fisher's exact test and comparing continuous variables using paired and unpaired student's *t* test. **Results:** There was a decrease in TSH levels of the participants by 12.5% and 7.9%, after intervention with AHF and AHMF, respectively. There were a small statistical significant difference only in waist-hip ratio ($p=0.04$) when compared before and after treatment with AHF and AHMF whereas there was no significant changes observed in other clinical variables after intervention with AHF and AHMF. **Conclusion:** This study may provide new evidence for the effectiveness of Ayurvedic herbal formulation and Ayurvedic herbo-mineral formulation in hypothyroidism in context of Nepal.

Keywords: Ayurvedic herbal formulation, Ayurvedic herbo-mineral formulation, Hypothyroidism, Nepal.

INTRODUCTION

Hypothyroidism is one of the major endocrine disorders seen in general population worldwide. It occurs due to the deficiency of thyroid hormones and leads to the reduction of basal metabolic rate, affect physical and mental growth during infancy or childhood [1]. The prevalence of hypothyroidism in the developed world and Nepal is 4.6% and 13%, respectively [2-4].

Thyroxine (T4) and tri-iodothyronine (T3) are the two hormones secreted by the thyroid gland for maintenance of body homeostasis. Disorders of the thyroid gland can stimulate the overproduction of thyroid hormones or cause glandular destruction and hormone deficiency. Hypothyroidism is defined as reduced production of thyroid hormones [5]. The causes of hypothyroidism are usually divided primary, secondary and tertiary hypothyroidism. The permanent loss or destruction of the thyroid by autoimmune diseases, irradiation injury etc. is called peripheral or primary hypothyroidism, which is the cause of approximately 99% of cases of hypothyroidism. Insufficient stimulation of the normal thyroid gland as a result of hypothalamic and pituitary defects in the thyroid stimulating hormone (TSH) molecule is described as central or secondary and tertiary hypothyroidism, respectively and is accounted for less than 1% of all cases throughout the world [6-8]. The common signs and symptoms of hypothyroidism are fatigue, lethargy, constipation, cold intolerance, weight gain, hoarse voice, pale and dry skin, brittle fingernails and hair, a puffy face, an elevated blood cholesterol level, muscle aches, tenderness, stiffness and weakness, pain, stiffness of swelling in the joints, heavier than normal menstrual periods, and depression. Hypothyroidism in infants and teenagers may result in poor growth and mental development as well as delayed development of permanent teeth and puberty [7]. Diagnosis of categories of hypothyroidism is based on an appropriate laboratory evaluation. TSH assays is preferred as the primary test to establish the diagnosis of primary hypothyroidism whereas free thyroxine (fT4) or total thyroxine are more important measures for the diagnosis of secondary or tertiary hypothyroidism. In addition to these tests, thyroid peroxidase (TPO) antibodies (TPOAbs), thyroglobulin antibodies, thyroid scans, and ultrasonography may be included to diagnosis the cause of hypothyroidism. In primary abnormality of thyroid function, serum TSH is elevated with normal serum fT4. Autoimmune thyroid disease is detected mostly by measuring circulating antibodies against TPO. Autoimmune process gradually reduces the thyroid function, and there is a compensation phase when the normal thyroid hormone levels are maintained

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- iii. Clinical effect of an ayurvedic herbo-mineral formulation in COVID-19 patients with 14 days follow up: A pilot observational study

Study design

- Study type: Interventional (clinical trial)
- Enrollment: 382 participants after exclusion from 429 patients
- Allocation: Non-randomized
- Intervention Model: Single group Assignment
- Interventional Model Description: A single-center, prospective, open label uncontrolled study (Herbo-mineral formulation)
- Masking: None (Open Label)
- Primary Purpose: Supportive Care and early negative result of COVID-19
- Condition: COVID-19 infection

Materials

Ingredients of herbo-mineral preparation

- Stem of guduchi (*Tinospora cordifolia*)
- Rhizomes of sunthi (*Zingiber officinale*)
- Fruits of marich (*Piper nigrum*)
- Fruits of pippali (*Piper longum*)
- Abhrak Bhasma (*Calcined Mica ash/Mica nanoparticles*)

Study participants

Inclusion criteria:

- Age ≥ 18 years at time of signing Informed Consent Form.
- Laboratory (RT-PCR) confirmed infection with COVID-19.
- No difficulty swallowing oral medications.

-
- Must agree not to enroll in another study of an investigational agent prior to completion of Day 7 of study.

Exclusion criteria:

- Allergies, known to be allergic to research drugs or drug excipients;
- Patient weight is less than 40 kg;
- Respiratory distress-RR $\geq$ 30 / min on room air, or SPO₂ $\leq$ 93%
- Shock;
- The clinician judges that Intense Care Unit monitoring treatment is needed;
- Patients who have participated in other clinical trials within 1 month;
- Known patients with impaired renal function (estimated creatinine clearance <60 mL / min)
- During the screening or within 24 hours before screening, patients were found to have any of the following laboratory parameter abnormalities (based on local laboratory reference range):-ALT or AST level> 5 times the upper limit of normal range (ULN) or-ALT or AST > 3 times ULN and total bilirubin levels> 2 times ULN;
- Known other comorbidities like hypertension, diabetes, cancer
- Being pregnant or breastfeeding, or having a positive pregnancy test at the time of pre-dose inspection, or planning to become pregnant within 3 months of study treatment.

Primary outcomes:

- Days required to get positive RT-PCR test of the COVID-19 to negative [Time Frame: max 10 days]

After 7th day of intervention RT-PCR was done Or till the symptoms resolved and RT-PCR gets negative.

Secondary outcomes:

- Symptom Progression: Fever [Time Frame: max 14 days]

The number of days required to reach a score from the symptom category of fever

based on a 0-3 scale:

0 = ≤ 98.6 , 1 = $> 98.6 - 100.6$, 2 = $> 100.6 - 102.6$, 3 = > 102.6

➤ Symptom Progression: Cough [Time Frame: max 14 days]

The number of days required to reach a score from the symptom category of cough based on a 0-3 scale:

0 = no cough, 1 = mild, 2 = moderate, 3 = severe

➤ Symptom Progression: Shortness of Breath [Time Frame: max 14 days]

The number of days required to reach a score from the symptom category of shortness of breath based on a 0-3 scale:

0 = no shortness of breath, 1 = with moderate intensity exercise, 2 = with walking on flat surface, 3 = short of breath with getting dressed or daily activities

➤ Symptom Progression: Fatigue [Time Frame: max 14 days]

The number of days required to reach a score from the symptom category of fatigue based on a 0-3 scale: 1=mild fatigue, 2=moderate fatigue, 3=severe fatigue.

➤ Severity of Symptoms [Time Frame: max 14 days]

➤ Adjunctive Medications [Time Frame: 28 days]

➤ Medicines Side Effects [Time Frame: 28 days]

Results

- Total no. of patients admitted from 2077/03/25 to 2077/05/16 is 429
- <18 yrs old: 35
- >65 yrs old: 7
- Patients referred: 5
- Total patients for analysis: 382
- Female: 110 (28.8%)
- Male: 272 (71.2%)

Table 2. Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
AGE	382				
Valid N (listwise)	382	18	65	31.81	9.959

Table 3. Clinical symptoms before and after treatment

Clinical symptoms	Before Treatment (%)	After Treatment (%)	Test for significance *
Fever	21.2	0	P value <0.001
Cough	12.3	3.1	
Fatigue	24.9	7.3	
Sore throat	6.5	0.8	
Dyspnea	2.1	0	
Bodyache	7.6	0	
Diarrhoea	4.5	1.8	
Nausea	5.5	1.3	
Running nose	5.5	0	
Loss of taste	13.1	5	
Loss of smell	10.5	3.1	

* Chi-square test

Table 4: Day-wise negative tested covid-19 patients after treatment

Primary outcomes	Intervention days				Total
	Day 7	Day 8	Day 9	Day 10	
Positive	52	89	139	43	323
Negative	8	20	28	3	59

Conclusion:

Faster viral clearance and better symptomatic improvement was observed in our study (84.6% recovery rate).

Due to encouraging outcomes of this trial, these drugs can be used in clinical practice too.

- iv. Elevated level of C-reactive protein and progression of severity in COVID-19 patients

In an another study at NARTC, a total of thirty-eight COVID-19 patients were involved comprising 29 male and 9 females with the maximum patients of age group 31-40 years (Table2). From each participant, serum C-reactive protein (CRP) level was determined. Since CRP is a non-specific acute phase protein molecule which is found elevated in inflammations and infections. High serum CRP levels were observed in COVID-19 patients who reflected the extent of lung lesions present and severity of COVID-19 disease.



C. TRAINING ACTIVITIES

Training and Certificate Distribution

NARTC stepped forward to achieve its training programs set up for fiscal year 2077-078. NARTC had conducted 4 training programs and some awareness programs for the year. A total of 75 Ayurveda Doctors, Paramedics and Health workers were trained and around 300 general public were given awareness programs regarding the importance of Ayurveda this year. The training programs were organized on different dates within a year. Because of the ongoing pandemic situation, we were unable to bring resource person physically so this year we conducted some training through webinar where participants were physically present in our center by maintaining physical distance in the classroom and resource person trained the participants through webinar. The following were the training activities given below:



1. Event I: Training and Workshop on Marma Chikitsa

NARTC conducted the training for 3 days from 5th to 7th Magh, 2077 BS where twenty-five Ayurveda Paramedics were trained during the workshop. The participants were selected from 7 provinces of Nepal. The closing ceremony featured with presence of Hon'ble Dr. Surendra Kumar Ray, State Minister, Minister of Health and Population, Prof. Dr. Dhanik Lal Bharkher, Chairman, Nepal Ayurveda Medical Council and Dr. Ram Adhar Yadav, Executive Director, NARTC.



2. Event II: Basic Training and Workshop on Panchakarma Chikitsa

NARTC conducted the training for 3 days from 26th to 28th Magh, 2077 BS, where twenty-six Ayurveda Paramedics were trained during the workshop. The participants were selected from 7 provinces of Nepal. The closing ceremony featured with the presence of Prof. Dr. Dhanik Lal Bharkher, Chairman, Nepal Ayurveda Medical Council, Prof. Dr. Dev Bahadur Rokka, Chairman, NARTC and Dr. Ram Adhar Yadav, Executive Director, NARTC.



3. Event III: Basic Training and Workshop on Marma and Yoga Therapy

NARTC conducted the training on Marma Chikitsa for 3 days from 24th to 26th Falgun, 2077 BS where twenty-seven Ayurveda Paramedics were trained during the workshop. The participants were selected from 7 provinces of Nepal. Dr. Sunil Kumar Joshi, MS (Shayla Tantra), Professor and Head of the Department (Gurukul Kangari State Ayurvedic College, Haridwa) was the chief resource person throughout the training period. The closing ceremony featured with presence of Hon'ble Mr. Nawaraj Rawat, Executive State Minister, Minister of Health and Population, Prof. Dr. Dhanik Lal Bharkher, Chairman, Nepal Ayurveda Medical Council and Dr. Ram Adhar Yadav, Executive Director, NARTC.



4. Event IV: Basic Training and Workshop on Kshar-Sutra Chikitsa

NARTC conducted the Basic Training and Workshop on Kshar-Sutra Chikitsa for 3 days from 26th to 28th Chaitra 2077 BS where seventeen Ayurveda Paramedics were trained during the workshop. The participants were selected from 7 provinces of Nepal. The closing ceremony featured with presence of Prof. Dr. Pradeep Baidhya, Consultant Hepato-biliary, Prof. Dr. Dhanik Lal Bharkher, Chairman, Nepal Ayurveda Medical Council and Dr. Ram Adhar Yadav, Executive Director, NARTC.



D. HEALTH CAMP

The new branch office of NARTC was inaugurated under the chairmanship of Mr. Rajendra Raman Khanal, Mayor of Belkotgadhi, Prof. Dr. Dhanik Lal Bharkher, Chairman, Nepal Ayurveda Medical Council and Dr. Ram Adhar Yadav, Executive Director, NARTC. Free Ayurveda Health camp and drug distribution program was also conducted in newly inaugurated branch in Belkotgadhi, Nuwakot district on 29 Falgun, 2077 B.S. Several hundred patients got free health checkup and free ayurvedic medicines in the health camp.



COVID-19 OUTBREAK

Background

As a part of the National healthcare system, NARTC has always been responsible towards any healthcare challenges that the country may face. NARTC began tracing COVID-19 patients via telephone calls among residents of Kirtipur Municipality with the help of Female Health Volunteers during Nepal's first lock-down period (11th Chaitra, 2077 B.S.). At the same time, the expert team of NARTC was continuously preparing for the possible management strategies of COVID-19 through Ayurvedic principles. Under the chairmanship of Executive Director, Ram Adhar Yadav, a thirteen membered committee was formed with Dr. Jitendra Shrestha as the coordinator to manage COVID-19 patients. Meanwhile, Ministry of Health and Population, Government of Nepal declared NARTC as an Isolation Center for COVID-19 patients on 25th Ashad, 2077 B.S. With this, NARTC faced both opportunity and challenges to serve the country in crisis during the very first wave of COVID-19 outbreak in Nepal.



Establishment of COVID isolation center

After the declaration of NARTC as a national isolation center for COVID-19 patients, a three storied building belonging to Institute of Medicine, Tribhuvan University just outside the premises of NARTC was provided for an isolation center of COVID-19 patients. The journey all started with managing beds, toilets and other logistics from the early stage. Due to time constraint and overwhelmingly increasing number of COVID-19 positive patients, isolation center had to be ready within 2 days. The isolation center was then initiated with a capacity of 200 beds for managing COVID-19 patients. NARTC is forever indebted towards various organizations namely, Covid-19 Control and Management Center (CCMC), Department of Health Services (DoHS): Logistic Department, Environment and Public Health Organization (ENPHO), Oxford Committee for Famine Relief (OXFAM), Kirti Ayurveda Medi Sales, Kathmandu Municipality, Kathmandu Upatyaka Khanepani Limited (KUKL) and Kirtipur Sub-municipality.



Management of COVID-19 cases

Interventional therapy for mild and moderate cases during the first and second wave of COVID-19 outbreak in Nepal

The expert team of NARTC took an initiative to formulate an innovative herbo-mineral formulation for the management of COVID-19 patients. The herbo-mineral formulation composed of aqueous extract of *Tinospora cordifolia*, powdered form of *Zingiber officinale*, *Piper longum*, *Piper nigrum* and *Abhrak Bhasma*. The drug proved to be very effective in reducing progression of severity of the symptoms as well as reducing the number of hospital stay for the COVID-19 patients. Along with this, immune booster herbal tea was given twice a day; COVID-19 patients were advised to gargle with guava leaves decoction and salt 2-3 times per day. Preferably ayurveda medicines followed by allopathic medicines in emergency case were given for the symptomatic management of COVID-19.

In addition to the intervention therapy, following therapies were also advised to the COVID-patients:

- YOGA
- PRANAYAMA
- MUSIC THERAPY
- LAUGHING YOGA



Dietary regimens

For dietary regimens, expert dieticians and nutritionists were consulted and proper nutritious diet was given to each admitted COVID-19 patients during the hospital stay. In addition to this, a teaspoonful of turmeric with one glass of lukewarm milk was given to each COVID-19 patients at bedtime.

As for relieving mental stress to COVID-19 patients, various entertaining serials were also shown in projector display at NARTC isolation center for COVID-19 each day at evening time.

Sample collection for COVID-19 identification at NARTC

Meanwhile, the pathology laboratory collected 894 nasopharyngeal or oropharyngeal oral swabs for COVID-19 identification varying the age below 10 to above 70 years. Out of 894 participants, 561 were males and 333 were females with the male-female ratio (M:F) is 1.68:1. The maximum participants involved and the incidence of the disease was observed in the age group 21 to 30 years while low in age group below 10 years (Table 2).



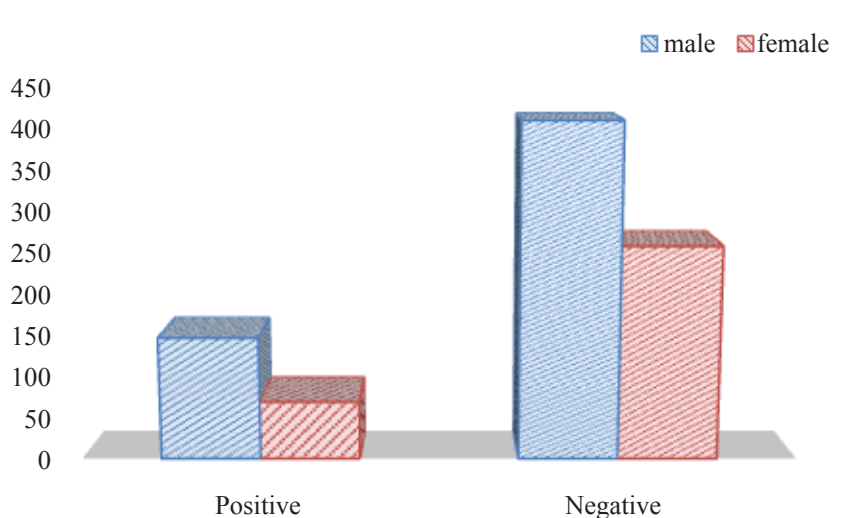
Table 5: Age and gender wise distribution of Oral swab collection

Age Group	PCR Positive		PCR Negative	
	Male	Female	Male	Female
<10	0	2	11	16
11-20	10	8	38	25
21-30	52	27	175	125
31-40	51	23	120	57
41-50	22	6	41	23
51-60	10	2	20	9
61-70	3	1	3	6
>70	2	2	3	1
Total	150	71	411	262

Among the collected swab specimens 221 were identified positive for COVID-19 consisting 150 males and 71 females whereas remaining 673 specimens were found to be negative accounting 411 males and 262 females (Figure 3). The overall incidence of the disease was found to be 32%.



Figure 3: Age and gender wise distribution of Oral swabs collected in Pathology laboratory, NARTC



Preparedness of High Dependency Units (HDUs) at NARTC

Sadly Nepal, following India, entered a second wave of COVID-19 outbreak since early April. The shocking rise in the number of Covid-19 infections was straining Nepal's fragile healthcare system during the second wave. NARTC isolation center quickly responded with prepared 30 bedded High Dependency Units (HDU) at Research Hospital Building of NARTC during the second wave of COVID-19. Several hundreds of COVID-19 patients with moderate and severe symptoms were cared at HDUs of NARTC. Expert team of NARTC developed integrated treatment protocol for the COVID-19 patients. Integrated treatment protocol included classical Ayurvedic Rasa Ausadhi and national guideline of COVID-19 management protocol.



Annex 1: Training and Workshop on Clinical Application of Marma Chikitsa

Date 2077.10.05 to 2077.10.07

S.N.	Name
1	Bijay Kumar Singh
2	Raj Kumar Mahato
3	Dhirendra Singh
4	Jayanarayan Yadav
5	Ramchabila Yadav
6	Sanjay Kumar Yadav
7	Hari Kishor Ray
8	Bhupendra Prasad Yadav
9	Pramod Kumar Yadav
10	Narayan Wosti
11	Ramkrishna Paudel
12	Devraj Lamichhane
13	Bimal Kumar Shrestha
14	Archana Kumari Jha
15	Ganga Tamang
16	Khemraj Devkota
17	Santalal Sahani
18	Arbind Marbaita
19	Sanjib Prasad Thakur
20	Shyam Mishra
21	Mukesh Jha
22	Pramodh Yadav
23	Gayatri Aryal
24	Indu Joshi
25	Ragini Jha

Annex 2: Basic Training and Workshop on Pancakarma Chikitsa

Date 2077.10.26 to 2077.10.28

S.N.	Name
1	Shanta KC
2	Sirjana Marasaini
3	Shyam Kumar Rayamajhi
4	Bishowraj Ghimire
5	Ganga Devi Sharma
6	Sarita Adhikari Devkota
7	Laxmi Prasad Sharma
8	Kamal Bikram Paudel
9	Ram Biswas Ray
10	Nagendra Prasad Yadav
11	Ashok Kumar Yadav
12	Arbind Kumar Das
13	Shyam Sundar Thakur
14	Sonelal Sah
15	Pramodh Kumar Swarnakar
16	Rakesh Kumar Yadav
17	Krishna Kumar Yadav
18	Gokul Parajuli
19	Manoj Kumar Yadav
20	Ganesh Yadav
21	Shyam Kumar Mishra
22	Mukesh Jha
23	Pramodh Kumar Sah
24	Gayatri Aryal
25	Indu Joshi
26	Ragini Jha

Annex 3: Basic Training and Workshop on Marma and Yoga Therapy

Date 2077.11.24 to 2077.11.26

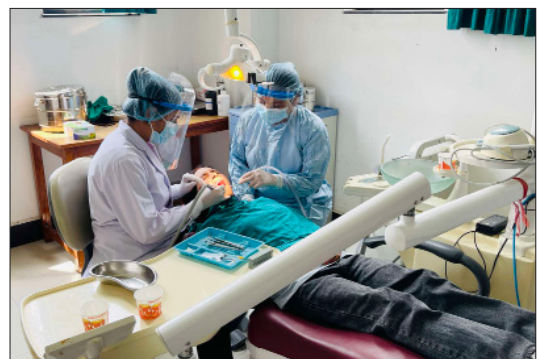
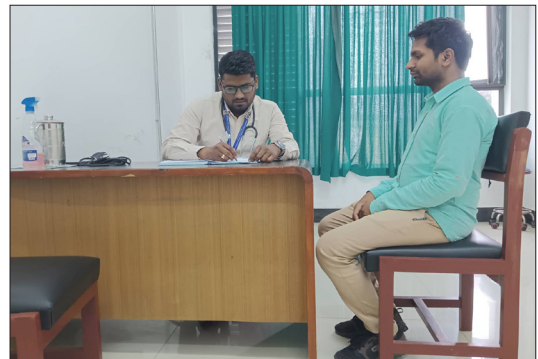
S.N	Name
1	Amar Bhuwan Chaudhary
2	Uddhav Bhattarai
3	Anil Kumar Thakur
4	Bal Keshar Pandit
5	Chandreshwor Prasad Baith
6	Parmananda Pathak
7	Ram Chabila Yadav
8	Bindi Yadav
9	Chunchun Prasad Yadav
10	Bharat Ray
11	Januka Dhungana
12	Nanda Kishor Ray Yadav
13	Prakash Sapkota
14	Hari Aryal
15	Sarita Adhikari Devkota
16	Sashi Koirala
17	Lokraj Pandey
18	Rajkumar Das
19	Dinbandu Mishra
20	Kisunlal Mahato
21	Shankar Prasad Sah
22	Kalpana Paudel
23	Hum Kumari Gyawali
24	Laxman Prasad Raut
25	Ram Sewak Yadav
26	Manoj Mahato
27	Tarni Prasad Chaudhary

Annex 4: Basic Training and Workshop on Kshar-Sutra Chikitsa

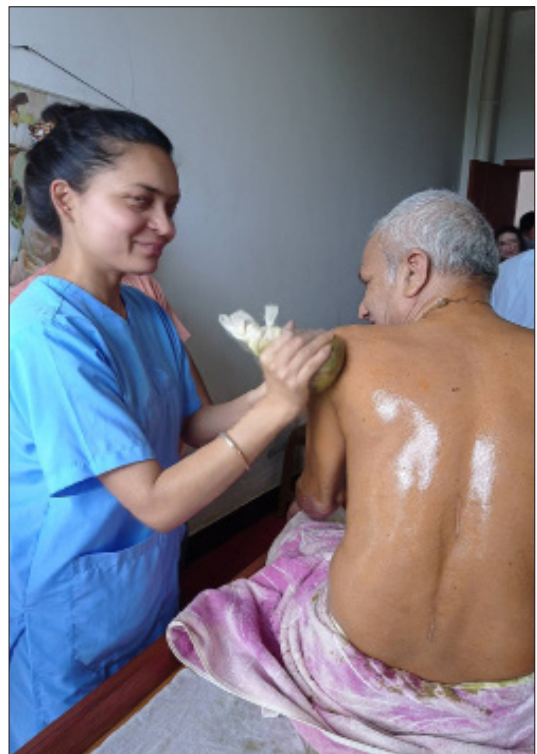
Date 2077.12.26 to 2077.12.28

S.N	Name
1	Suchi Kumari Sah
2	Jibaddha Kumar Panjiyar
3	Surendra Prasad Yadav
4	Sushil Kumar Mishra
5	Bhola Prasad Sah
6	Dwarika Sah
7	Babita Dhakal
8	Arbind Kumar Ray
9	Gobinda Prasad Gaire
10	Debendra Thakur
11	Gita Chaudhary
12	Rangalal Mahato
13	Sudhir Kumar Chaudhary
14	Radha Krishna Ray
15	Laxmi Narayan Mishra
16	Januka Bhandari Gaire
17	Indu Koirala

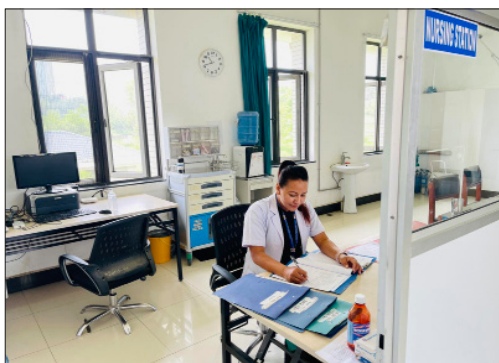
Healthcare Services



Healthcare Services



Healthcare Services



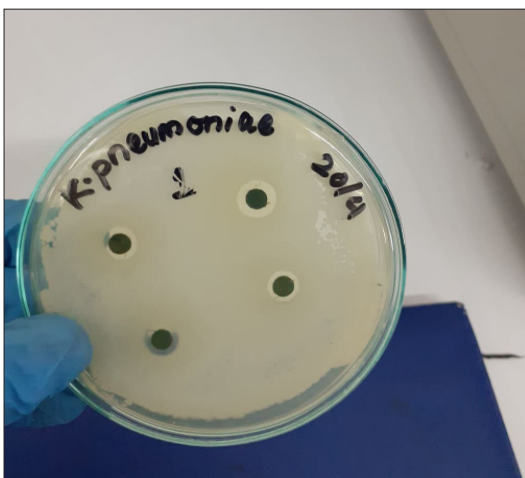
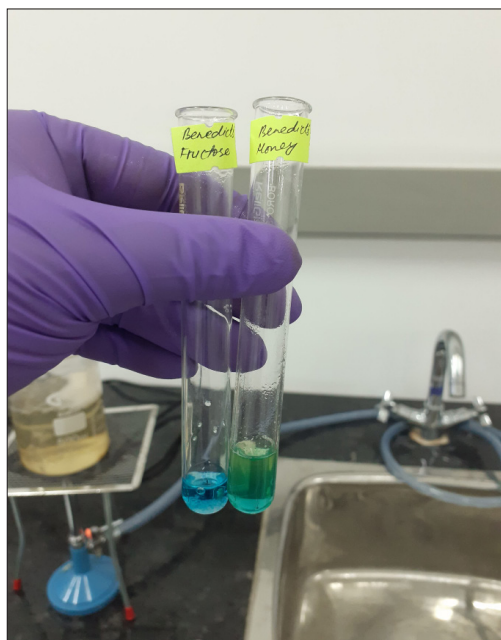
Research Activities



Research Activities



Research Activities



Training Activities



Training Activities



Training Activities



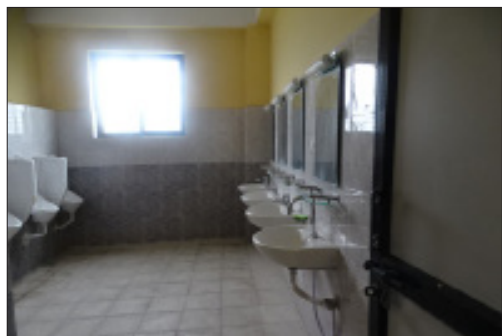
Management of Covid 19



Management of Covid 19



Management of Covid 19



Health Camp



Health Camp



Drug Distribution Program



Helping Hands

