



मोहन बहादुर बस्नेत
Mohan Bahadur Basnet

स्वास्थ्य तथा जनसङ्ख्या मन्त्री
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 glad to hear that National Ayurveda Research and Training Center is going to release its annual report for the year 2079-80. I extend my congratulations to the Executive Director and the entire dedicated team for yet another successful year.

The Ministry of Health and Population is deeply committed to advancing Ayurveda in Nepal. From the very beginning, the MoHP has consistently expressed optimism and provided unwavering support for the research, training, and healthcare services offered by NARTC. It is undeniable that NARTC has made substantial contributions through a range of research and training initiatives, enriching the Ayurvedic healthcare system in Nepal. I am confident that NARTC will continue to lead the way in innovative research and training endeavors, thus expanding the global reach of Ayurvedic healthcare services.

Lastly, I would like to convey my warmest congratulations to the entire NARTC team for their productive year, and I have full confidence that this institution will be proficient in the field of healthcare and research.

Thank you.

13 December, 2023

Mohan Bahadur Basnet
Minister



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Ministry of Health & Population



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**Ramshahpath, Kathmandu
Nepal**

Date :



It gives me immense pleasure to learn that the National Ayurveda Research and Training Center in Kirtipur is preparing to release its Annual Report for the fiscal year 2079/080. I extend my heartfelt congratulations to the entire team, as well as to the Executive Director, for the successful accomplishments of this year.

NARTC has exerted tremendous efforts to fulfill its missions and objectives in the field of Ayurvedic healthcare, research and training. The Ministry of Health and Population holds a positive outlook regarding this national institution, entrusting it with the responsibilities of conducting research, providing training and delivering healthcare services related to Ayurvedic medicine. I firmly believe that the strategies and plans executed by this institution will contribute significantly to the development of the Ayurvedic healthcare system within the country.

I express my congratulations to the National Ayurveda Research and Training Center team for their achievements in this fiscal year and have every confidence that they will continue to excel in the years to come.

Dr. Roshan Pokhrel

Secretary

Executive Summary

National Ayurveda Research and Training Center (NARTC) stands as a premier national institution within Nepal, dedicated to advancing research, providing training, and delivering healthcare services. Since its establishment, NARTC has primarily focused on being a national authority for the effective development and promotion of Ayurveda. To achieve this goal, it has actively engaged in diverse research endeavors aimed at producing scientific evidence in the realm of Ayurvedic treatments.

It's a source of great satisfaction to note that NARTC has been experiencing steady growth of achievements. This fiscal year, we have continued research on antimicrobial and phytochemical analysis along with cytotoxic evaluation. This definitely has made a new paradigm shift in understanding anti-cancer properties of such herbs. NARTC is very hopeful to develop cancer agents using Ayurvedic formulation in the near future. In this fiscal year, we also continued micro-propagation of high value medicinal plants which we aim to distribute among local farmer helping them to improve their socio-economic status. A new research project on *Paris polyphylla* has been started to explore its anticancer properties and also thoroughly investigate its chemical constituents.

NARTC has also undertaken a randomized controlled trial to assess the effectiveness and safety of herbo-mineral preparations as complementary treatments for uncontrolled type 2 diabetes mellitus. Through such research endeavors, we strive to raise awareness about disease prevention, treatment, and future implications in the wider population.

Our commitment to enhancing the skills of Ayurvedic doctors, health workers, and paramedics remains steadfast. This fiscal year we have organized several training programs and workshops, including Basti therapy and the clinical application of Marma chikistha, conducted by experts and consultants from both national and international institutions. Similar programs on Panchakarma and the Kshar-sutra technique for ano-rectal diseases have been carried forward, alongside ongoing stress management sessions.

In healthcare services, NARTC's hospital continues to provide cutting-edge Ayurvedic treatments. The institution is increasingly recognized as a center of excellence for managing ano-rectal diseases using the Kshar-sutra method and addressing metabolic diseases through Panchakarma therapy. We also remain committed to our mission of distributing free medicines to those in need. The institution remains vigilant in addressing the ever-evolving challenges and opportunities in the field of Ayurveda.

To expand our reach to rural areas, health camps have been conducted in various districts outside the Kathmandu valley. Lastly, I extend heartfelt gratitude to all the doctors, research officers, administrative staff, and the entire NARTC family for their unwavering support and cooperation in our ongoing mission to serve 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 *Ropanis*). 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

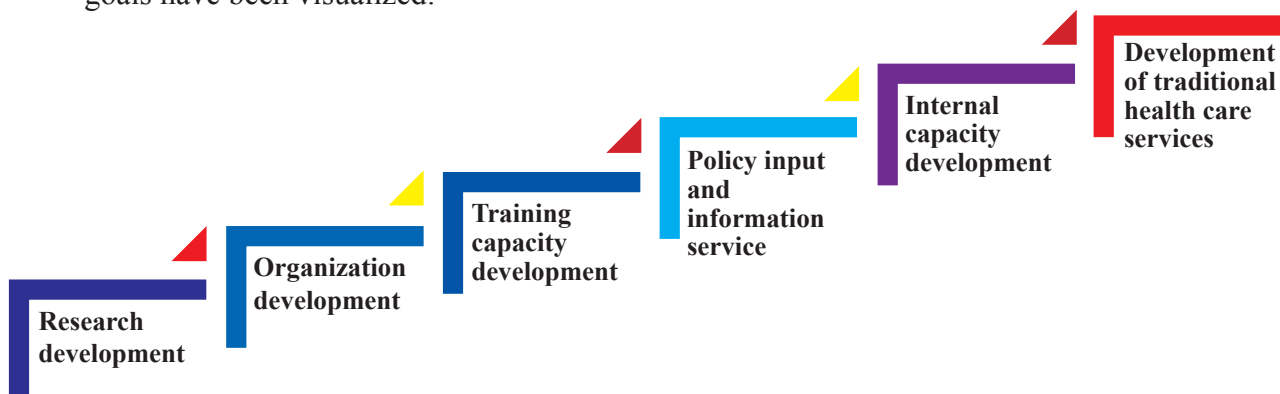
- Support and conduct ethical research in Ayurveda.
- Train and provide skilled manpower in field of Ayurveda.
- Implement evidence based research in treatment to the patient care activities to validate Ayurvedic treatment.
- Advocate and disseminate knowledge of Ayurveda research for the welfare of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

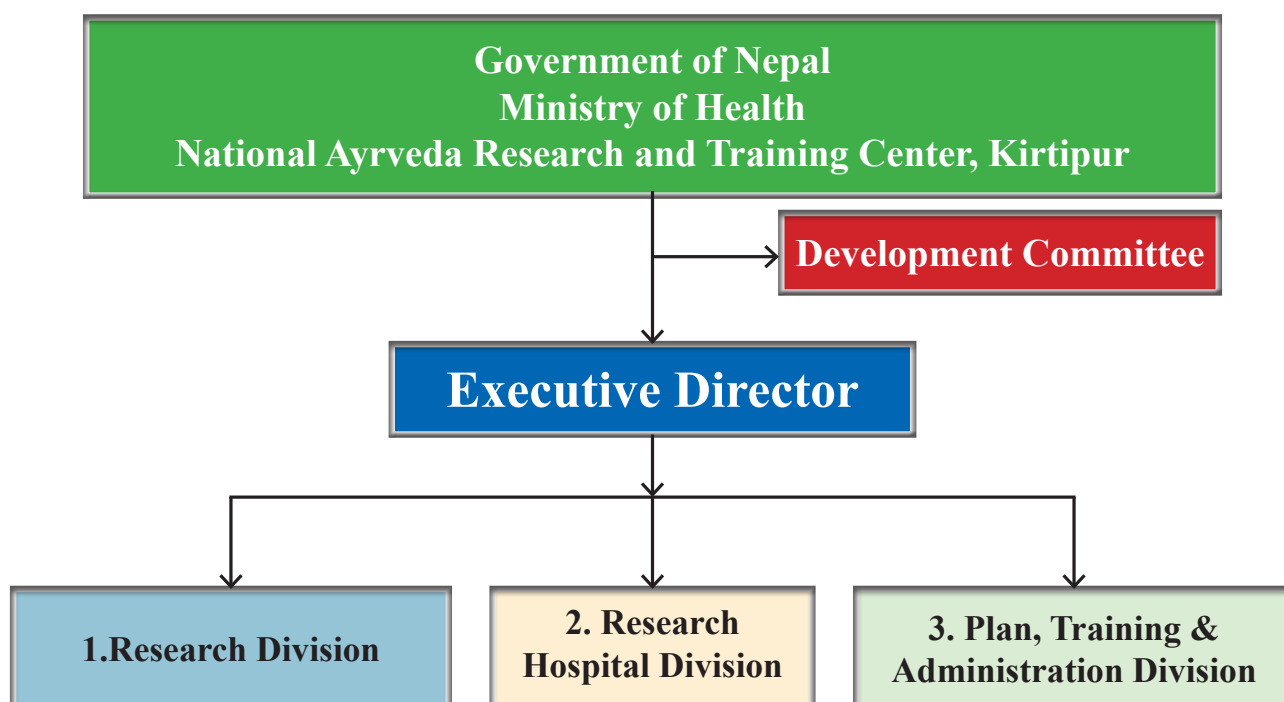
Organization structure

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.

Below is the list of branches currently in service.

- Province 1, Laukahi, Sunsari
- Province 2, Bardibas, Mahottari
- Province 3, Nuwakot, Belkotgadhi
- Province 4, 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.

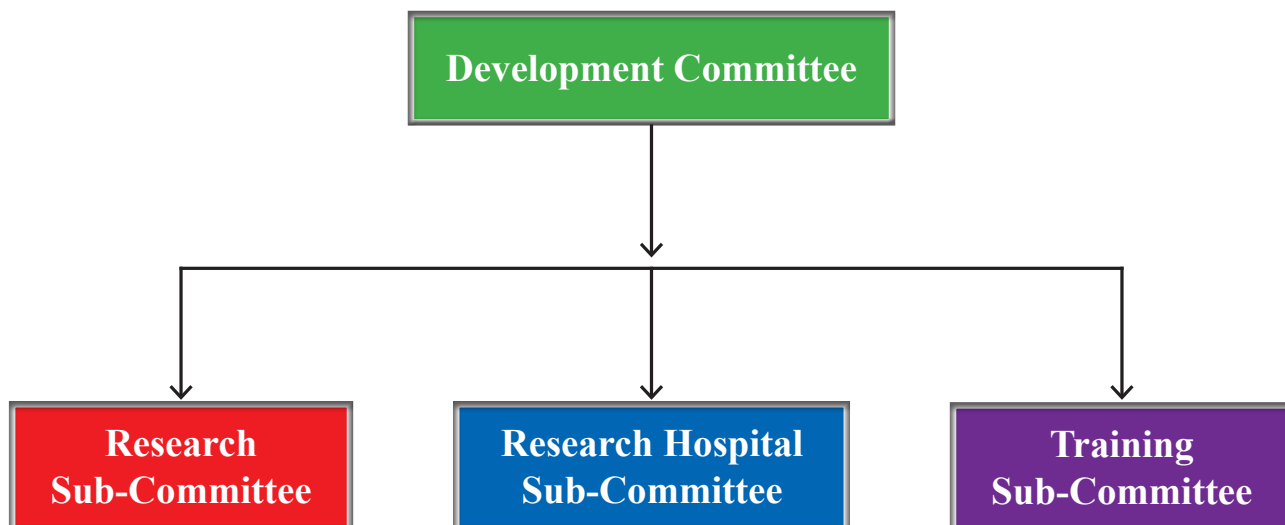
Functions

- 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

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

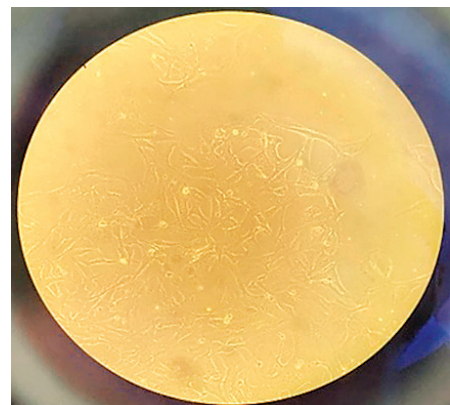
- Chromatographic techniques for separation and analysis of samples.
- Separation of plant product on the basis of polarity, volatility and so on
- Standardization of Ayurveda medicines
- Determination of Dissolution, hardness, total ash, alcohol, extractive values, water soluble extractive, moisture 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

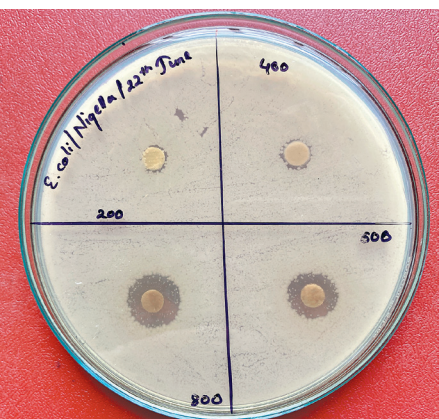
Animal/Clinical trials

- 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 2079/80

A. HEALTH CARE ACTIVITIES

Research Hospital

NARTC has its own research hospital with a bed capacity of 31 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 to 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 2079/80, a total of 11,565 patients visited the NARTC including 4,481 new cases and 3,853 follow up cases, out of which 4,286 patients attended Kayachikitsa OPD whereas 2,303 patients attended Shalya OPD respectively.

Table:. Frequency of patients visited NARTC OPDs in the year 2079/80

Service	Frequency
Total patients/cases	11565
New cases	4481
Follow up cases	3853
Renew cases	3273
Kaya Chikitsa (I, II & VI) OPD	4286
Shalya OPD	2303

The Figure represents the frequency of patients who received the available services at NARTC in the year 2079/80. Among the services, the maximum patients i.e. 1,852 patients received Pathology laboratory services (including Diabetic research tests) followed by Physiotherapy services with 1,425 and acupuncture services with 1273 patients. Similarly, our Radiology & imaging unit provided services to 1,220 patients comprising 546 tests in X-ray, 453-USG and 21 ECG tests whereas, 934 patients were enrolled in Panchakarma unit and 644 patients were in Dental unit.

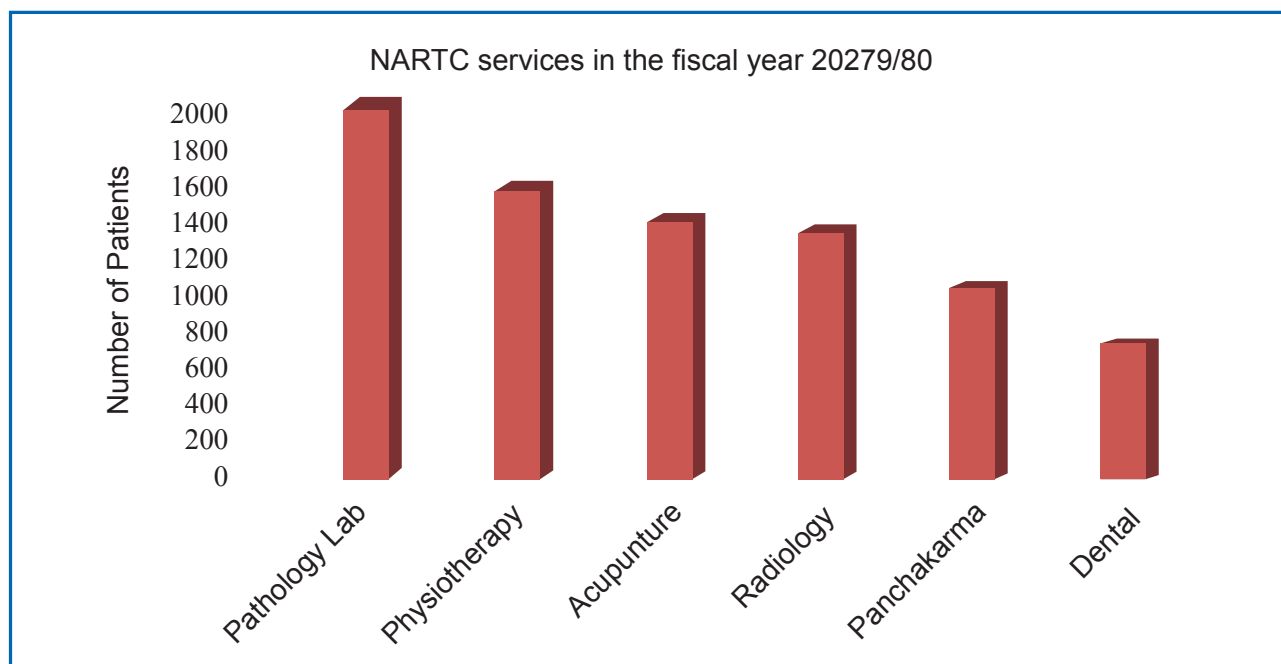


Figure: Distribution of services provided by NARTC in the year 2079/80

Pathological Services

In the year 2079/80, we received 1,852 routine test samples in the Pathology laboratory of NARTC consisting 1,641 OPD tests whereas 211 tests were research based routine tests. Overall, biochemistry

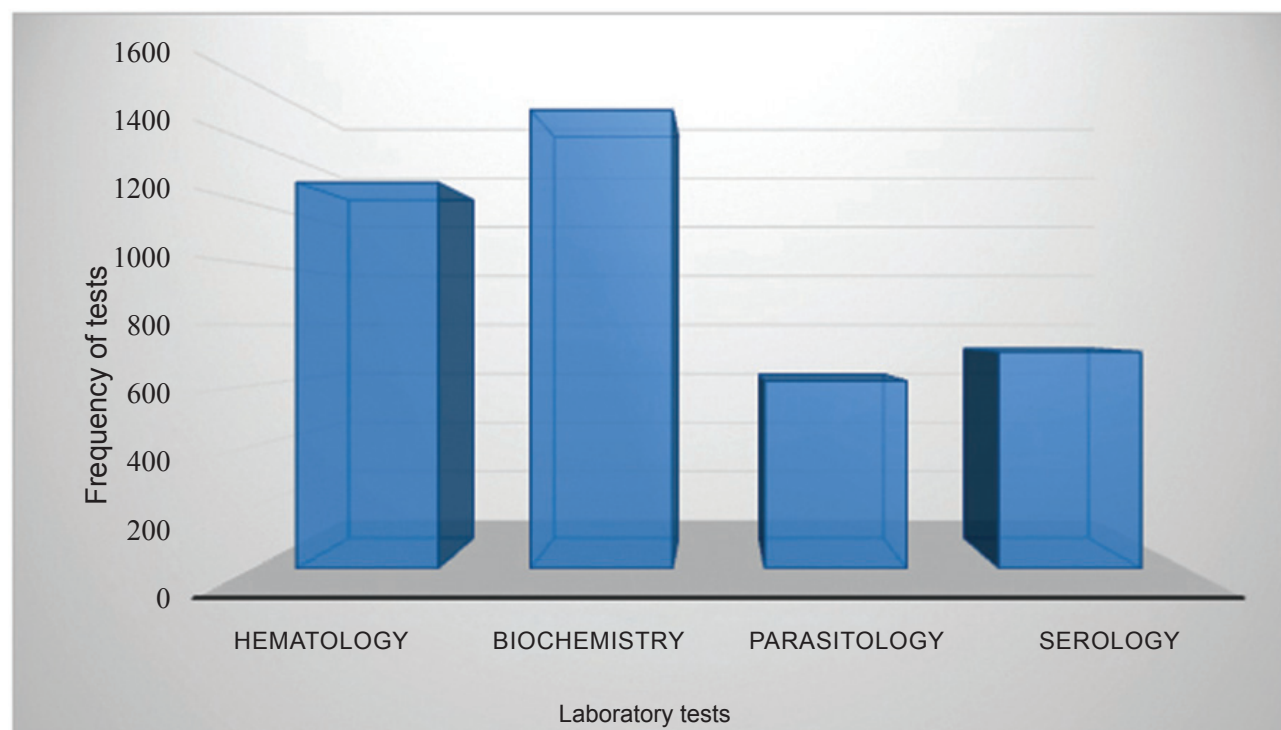


Figure: Distribution of routine tests in Pathology laboratory, NARTC in the year 2079/80

section comprised 1,505 tests, hematology accounted 1,267 tests, serology with 712 tests and parasitology with 615 tests (Figure 2). The received test samples include blood, urine and stool specimens.

Among 211 research-based laboratory tests, 201 were biochemistry tests, 157 were hematology tests, 138 were parasitology tests and 132 were serology tests.

Inpatient Department (IPD)

The total bed capacity for IPD at our institute is 31 beds. During the fiscal year 2079/80, 308 patients were admitted to IPD department, out of which 138 were operated cases.

B. RESEARCH ACTIVITIES

Clinical Research

1. Effect of plant-based diets and GK3 Kasaya (decoction) in Madhumeha (Type 2 Diabetes mellitus)

Abstract

Uncontrolled DM despite using modern medicines are increasing day by day. So, recently more research interest is centered globally in quest for dietary patterns and alternative medicines to treat DM. In regard to the efficacy of plant-based diets and Ayurvedic medicines for DM, some scientific investigations have resulted plant-based diets and Ayurvedic medicines to be effective and relatively non-toxic. The use of herbs are abundant in context of Nepal and to enhance the value of the herbs, research is needed. There is currently no general optimal meal plan or dietary pattern for T2DM patients. Hence, we attempted the integrated approach (plant-based diet and GK3 decoction) to manage T2DM.

Objectives

- To find out whether on discontinuing the allopathic medicines and being on a particular plant-based diet can manage T2DM
- To evolve an effective drug having Madhumehahara (anti-diabetic) action as per the classical literature of Ayurveda
- To evaluate the clinical characteristics; biochemical parameters of DM patients

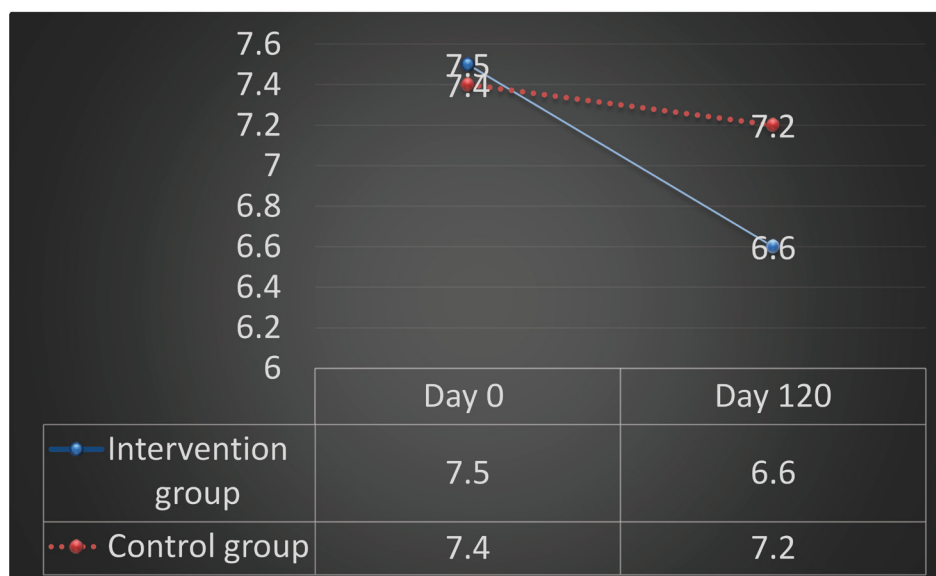


Figure: HbA1C at baseline and day 120 in participants with mean compliance $\geq 9/10$ points

Plant based diet and GK3 decoction was found to be effective for glycemic control among T2DM patients. Our effective plant based diet approach can be applied for T2DM patients.

2. A one year follow-up after a randomized controlled trial of Trikgud in type 2 diabetes mellitus

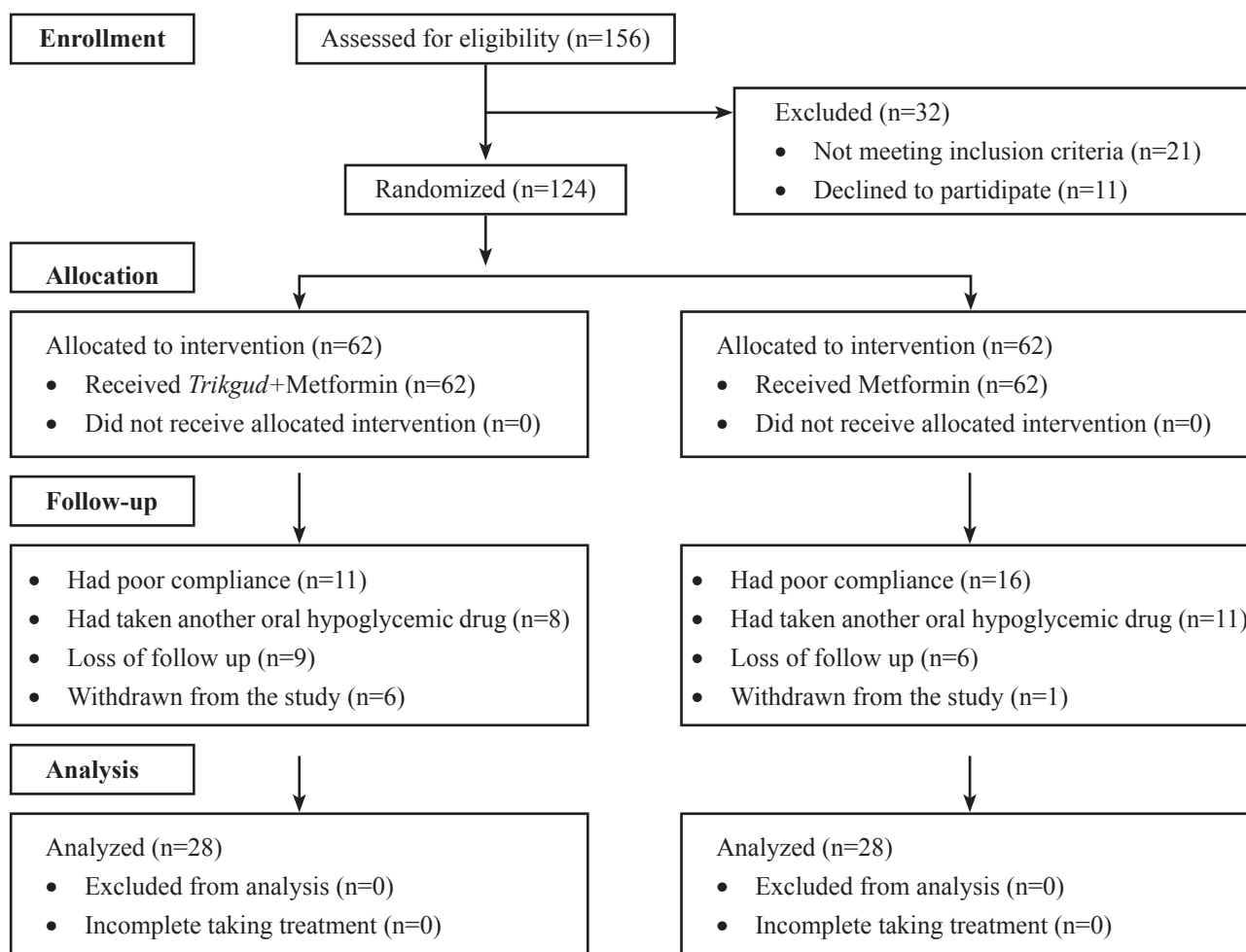
Objectives:

- To evaluate BGL (Fasting & Post prandial) and Hb1AC of Type 2 diabetes mellitus (T2DM)
- To assess the quality of life in T2DM patients
- To find our safety and efficacy of Trikgud after prolonged intervention

Justification of the study

- Long term treatment adherence is important to prevent or reduce the progression of diabetic complications
- Evaluation of treatment continuity will provide useful information for clinical practice
- This study is the extension of the previously performed RCT

Participants:



Results:

Table: Characteristics of participants at the RCT baseline

Variables	<i>Trikud</i> group (n = 22)^{a,b}	<i>Met</i> group (n = 12)^{a,b}	<i>p</i> – value^{c,d}
Body weight (kg)	66.2.1 (3.1) ^a	64.5 (4.9) ^a	0.22 ^c
Body mass index (kg/m ²)	24.5 (1.2) ^a	25.2 (1.8) ^a	<0.01 ^c
Waist circumference (cm)	87.3 (4.2) ^a	84.1 (4.8) ^a	0.05 ^c
Hip circumference (cm)	89.0 (3.3) ^a	86.8 (4.2) ^a	0.10 ^c
Waist-hip ratio	0.98 (0.01) ^a	0.97 (0.02) ^a	0.06 ^c
Systolic blood pressure (mm Hg)	126.2 (8.0) ^a	125.4 (9.4) ^a	0.80 ^c
Diastolic blood pressure (mm Hg)	78.3 (6.4) ^a	81.3 (7.7) ^a	0.23 ^c
Fasting blood glucose (mg/dl)	112.0 (8.2) ^a	118.1 (14.3) ^a	0.12 ^c
2-h Post prandial glucose (mg/dl)	142.1 (15.9) ^a	142.5 (17.5) ^a	0.95 ^c
HbA1c (%)	7.1 (0.7) ^a	7.2 (0.6) ^a	0.68 ^c

Table: Characteristics of participants at the RCT follow-up

Variables	<i>Trikgud</i> group (n =22) ^{a,b}	<i>Met</i> group (n = 12) ^{a,b}	p – value ^{c,d}
Blood urea nitrogen (mg/dL)	18.2 (3.1) ^a	19.0 (1.2) ^a	0.40 ^c
Serum creatinine (mg/dL)	0.9 (0.1) ^a	0.9 (0.2) ^a	1.00 ^c
Sodium (mEq/L)	141.3 (1.8) ^a	140.2 (2.1) ^a	0.12 ^c
Potassium (mEq/L)	4.2 (0.2) ^a	4.3 (0.1) ^a	0.12 ^c
Bilirubin Total (mg/dL)	0.8 (0.60, 0.90) ^b	0.8 (0.50, 0.90) ^b	0.99 ^d
Bilirubin Direct (mg/dL)	0.10 (0.10, 0.20) ^b	0.10 (0.10, 0.20) ^b	1.00 ^d
SGPT (IU/L)	20.6 (9.0) ^a	31.7 (8.6) ^a	<0.01 ^c
SGOT (IU/L)	24.1 (4.7) ^a	29.3 (1.2) ^a	<0.01 ^c
Alkaline Phosphatase (IU/L)	54.7 (12.5) ^a	61.1 (13.2) ^a	0.17 ^c
Triglycerides (mg/dL)	118.2 (38.4) ^a	128.0 (32.4) ^a	0.46 ^c
HDL cholesterol (mg/dL)	51.2 (8.2) ^a	52.8 (8.5) ^a	0.60 ^c
LDL cholesterol (mg/dL)	66.5 (12.8) ^a	78.2 (18.1) ^a	0.04 ^c

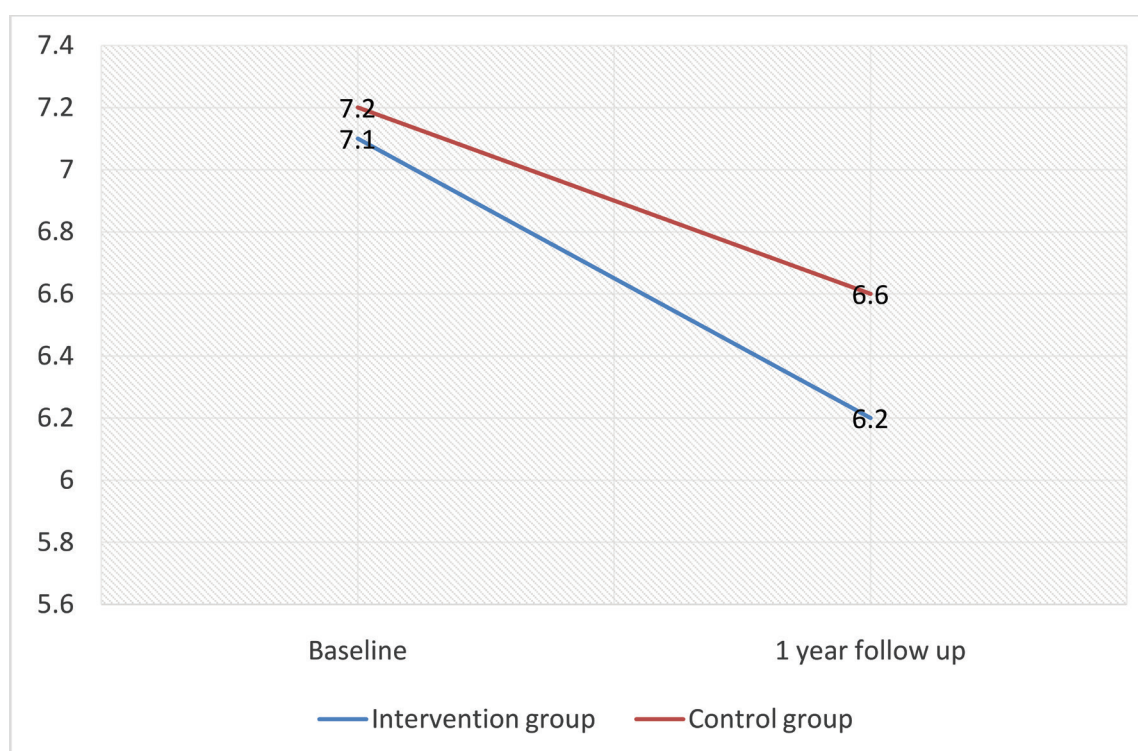


Figure: HbA1C at baseline and one year follow up

There were no significant differences within and between groups in other outcomes. We demonstrated that Trikgud showed persistent improvement in HbA1c for 1 year after the RCT. However, We did not consider the drug-drug interaction and drug dose reduction, and there was obvious imbalances in medication adjustment between the 2 groups.

Efficacy and safety of Trikgud as an add-on medicine in uncontrolled type 2 diabetes mellitus (T2DM) patients with metformin monotherapy: A randomized controlled trial

Abstract

Metformin is quite effective in managing Type 2 diabetes mellitus (T2DM). Studies have reported that the combined use of oral hypoglycemic medicines is prescribed in uncontrolled T2DM metformin monotherapy. So, we aim to evaluate the efficacy and safety of Ayurvedic herbo-mineral formulation (*Trikgud*) in managing uncontrolled T2DM with metformin monotherapy in Nepalese population. This study was a randomized controlled trial. A total of 56 participants with the diagnosis of T2DM were randomly assigned to the intervention group (*Trikgud*met) or control (Met) group in a ratio of 1:1 for 12 weeks. The primary outcome measures were the difference in the change in glycated haemoglobin (HbA1C), fasting plasma glucose (FPG) and 2-h postprandial plasma glucose (2-h PPG) between the groups, and secondary outcome measures were the change in body mass index (BMI), waist-hip ratio (WHR), lipid profile, liver function tests and renal function tests between the baseline and at 12 weeks after intervention. At week 12, there were significant differences of FPG and 2-h PPG in both *Trikgud*met group and Met group when compared with week 0. There was a statistically significant decrease of 8.6% and 10.1% of HbA1C levels in *Trikgud*met and Met groups, respectively. This study may provide "a new evidence for use of *Trikgud* as an add-on therapy for uncontrolled T2DM patients with metformin monotherapy in context of Nepal.

Keywords: Type 2 diabetes mellitus, trikgud, metformin

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Abbreviations: SEAR, southeast asia region; IDF, international diabetes federation; T2DM, Type 2 diabetes mellitus; FBG, fasting blood sugar; STZ, streptozotocin; PPG, post prandial blood glucose; HbA1c, glycosylated hemoglobin; NARTC, national ayurveda research and training center; FPG, fasting plasma glucose; 2-h PG, 2-h plasma glucose; OGTT, oral glucose tolerance test; RPG, random plasma glucose; API, ayurvedic pharmacopoeia of India; ALT, alanine aminotransferase; AST, aspartate aminotransferase; HDL, high-density lipoprotein; LDL, low-density lipoprotein; BMI, body mass index; WC, waist circumference; WHR, waist-hip ratio; SPSS, statistical package for the social sciences.

Introduction

Diabetes is a chronic metabolic disease with a major impact on human being worldwide. It is estimated that 537million adults aged 20-79years are currently living with diabetes. The total number of people with diabetes is predicted to increase to 11.3% by 2030 AD and 12.2% by 2045 AD. Diabetes mellitus is also a growing public health concern in the Southeast Asia region (SEAR), where more than 90.2million people are living with diabetes. International Diabetes Federation (IDF) projects that the number of people with diabetes in the SEAR will increase 68%, reaching 152million by 2045 AD. The number of people with diabetes aged 20-79years in Nepal is 1.1million.¹

Type 2 diabetes mellitus (T2DM) is the most common type of diabetes, accounting for over 90% of all diabetes worldwide. The first choice of managing T2DM is by improving a healthy lifestyle. If not controlled with healthy diet, proper physical activity and other healthy lifestyle measures, oral medication is usually initiated.¹ Metformin is

the first-line medicine for T2DM and the most commonly prescribed drug for T2DM worldwide, either alone or in combination with other glucose-lowering therapies or insulin. Metformin is a biguanide, a drug class of herbal origin that has been widely used to treat diabetes since the 1950s.² It is difficult to determine the right choice of additional anti-hyperglycemic drug to manage uncontrolled T2DM with metformin monotherapy.³ Even though previous clinical studies have shown that the combined use of oral hypoglycemic medications is more effective than antidiabetic monotherapy,^{4,6} but, a systemic review and meta-analysis for add-on therapies to metformin have shown similar effect to those for monotherapies.⁷

Although modern drugs are quite effective in getting blood glucose level down, it is subject to sustaining certain side effects.⁸⁻¹⁴ Hence, a quest of alternative approach in the management of T2DM is essential and Ayurveda treatment modality is one such approach to manage T2DM.

In Ayurveda, the term *Madhumeha* (one type of *Prameha*) is used as synonym of diabetes mellitus. Although *Prameha* is a *Tridoshaja* disease (a disease involving all three of the psycho-physiologic principles termed as *Doshas*), but *Doshas* may get involved in different proportions and produce *Kaphaja*, *Pittaja* and *Vataja Prameha*.¹⁵ *Madhumeha* is a type of *Vataja Prameha* which occurs either due to genetic causes (*Sahaja Pramehi*) or improper management of *Prameha* (*Apathyanimitaja*).¹⁶ *Madhumeha*, therefore, is a terminal stage of *Prameha* and is incurable or extremely difficult to cure.¹⁷

As regards to drugs in Ayurveda, there are so many drugs and formulations but the main drugs are either bitter (*Tikta*) or astringent (*Kashaya*) in taste. They improve the fat and carbohydrate metabolism.¹⁸ The selected herbs {*Kutki* (*Picrorhiza kurroa*),

Medicinal Plant Research

i. Phytochemical Screening, Antioxidant activity, Antimicrobial activity and HPLC analysis of cultivated *Paris polyphylla* Sm. rhizome extract

Research Summary

Taxonomy:

Scientific name: *Paris polyphylla* Sm.

Family: Melanthiaceae

Local name: Satuwa

Habitat and range:

Asiatic countries, especially in the South Eastern hemisphere. Grows at an altitude of 3300 meters. Blooms well in places with moist and humus rich soil. A perennial herbaceous plant.

Ecology:

Dies during winter and regenerate again in spring. Flowers from April to May, fruits from June to August. About 10–100 cm tall from a rhizome 1–2.5 cm thick

Regeneration:

Can be propagated through seed and also from underground rhizomes

Lifecycle:

A monocious plant, completed in two or more years. Takes about seven months to germinate from the seed

Important bioactive compounds:

Polyphyllin I, polyphyllin II, polyphyllin VI, and polyphyllin VII are a group of steroidal saponins

Objectives:

- i. To collect plant materials, conduct their identification, and prepare the extract using different solvents
- ii. To identify the phytochemical
- iii. To screen antimicrobial activity against four common pathogenic bacterial species.
- iv. To separate the active compound
- v. To describe the variation of the content of main active compounds (polyphyllin I, polyphyllin II, polyphyllin VI and polyphyllin VII)

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.

Rationale:

- For bringing about improvement in quality control of plant phytochemicals for maximum drug efficacy and safety, it is fundamental to screen medicinal plants for the presence active constituents of choice
- There exists variability in the active constituents of same plants at various developmental stages growing under different environmental conditions, quantification of the phytochemicals is fundamental for correct identification

Results:

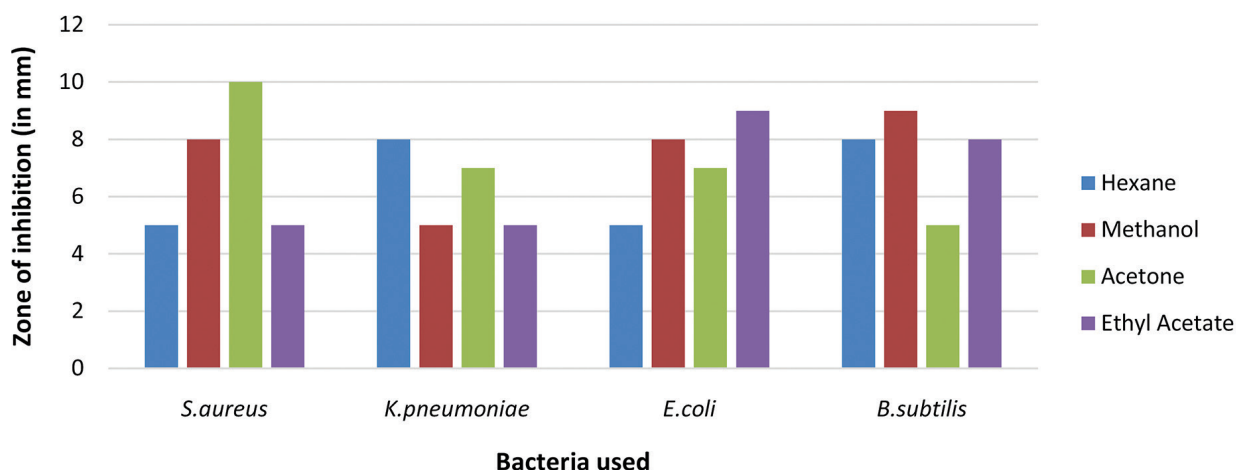


Figure: Antibacterial activity of Paris polyphylla rhizome extracts (conc=1gm/ml)

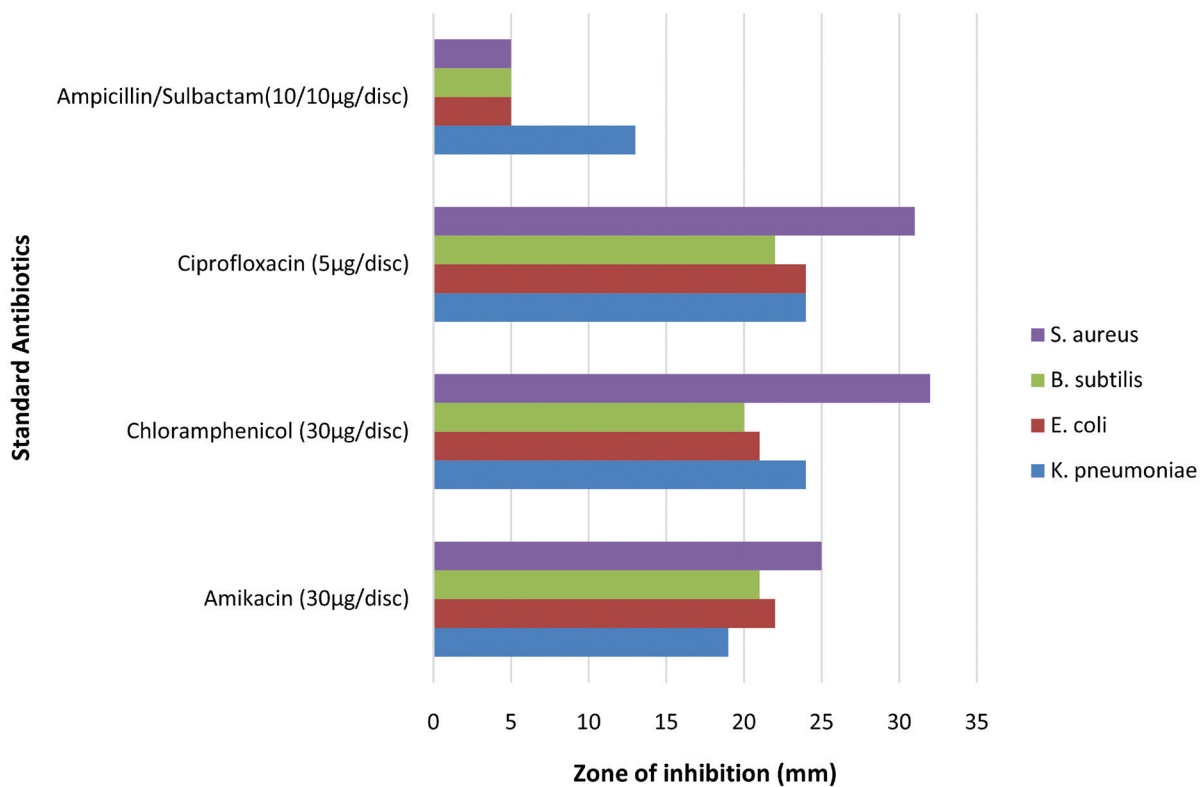


Figure: Zone of inhibition in comparison to different standard antibiotic disc

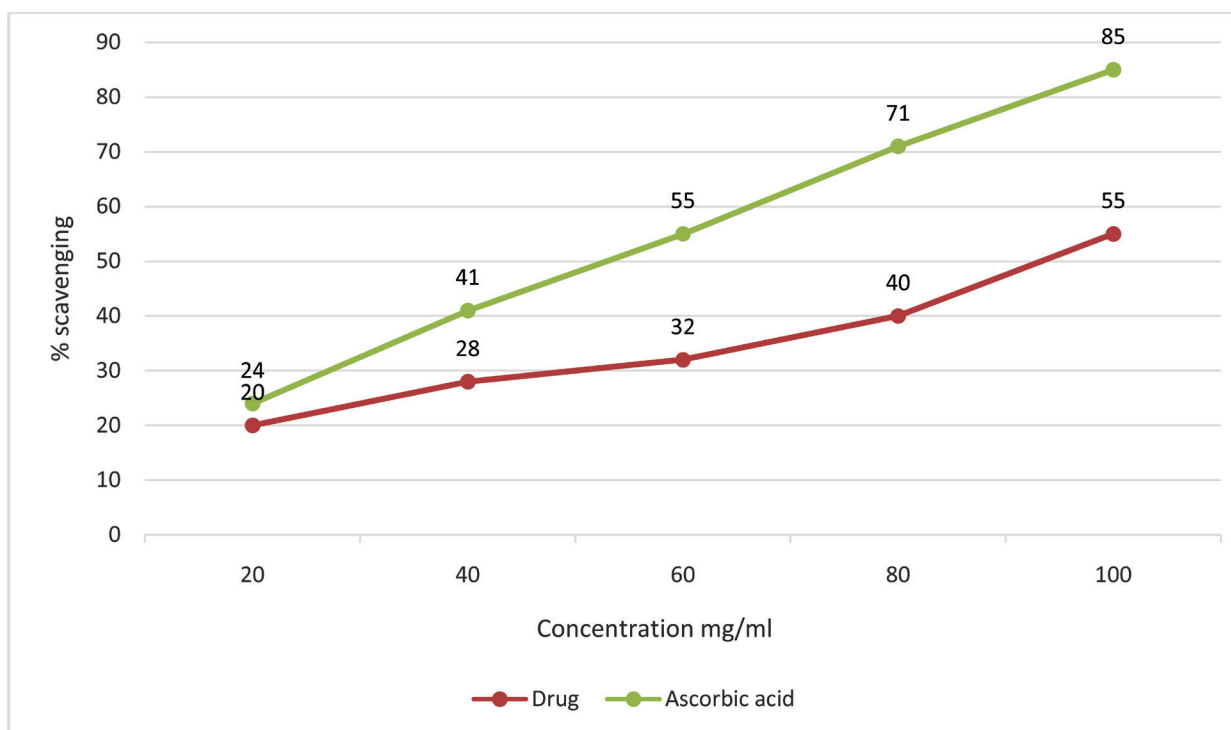


Figure: DPPH radical scavenging activity of Ascorbic acid and methanolic extract of *P. polyphylla*. The moderate antioxidant activity of the drug is due to the high content of total phenolic and saponins.

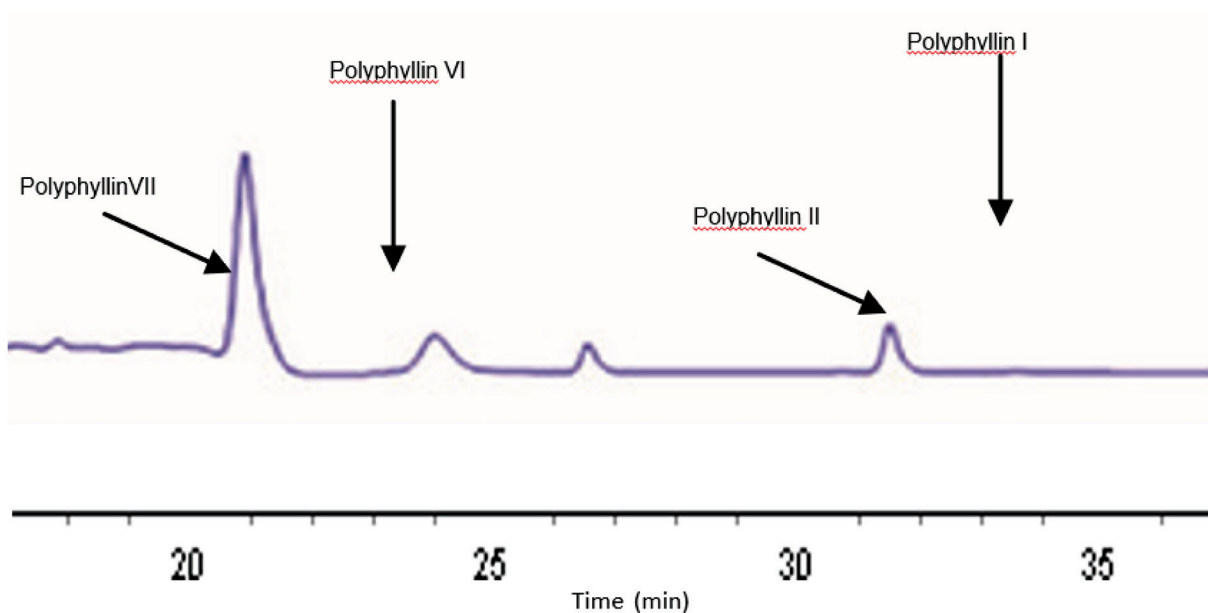


Figure: HPLC curve of methanol extract of the sample 10 μ l of extract was injected and absorbance was monitored at 210 nm.

There was wide variation of content of bioactive compound in extract of *Paris polyphylla* Sm. rhizome. This might have a correlation with the habitat and it need further research.

ii. An Assessment of Antioxidant, Antimicrobial and In vitro cytotoxic activity of alcoholic extract of *Nigella sativa* seeds.

Abstract:

Background:

Nigella sativa is a native plant of Nepal growing at elevations of 1500–2500 m. The seeds of *N. sativa* are considered as an important nutritional flavoring agent and natural remedies for various ailments for hundreds of years in ancient systems of medicines like Ayurveda, Chinese and Arabic medicines. Different active components such as thymoquinone, thymol, thymohydroquinone, nigellicine and nigellidine have been isolated from *N. sativa*. Oils, various extracts and active components are identified to be effective in immune stimulation, anti-inflammation, antihypertensive, antimicrobial, antiparasitic, hypoglycemic, antiasthmatic, antioxidant and anticancer effects. The present work is aimed at investigating the anticancer potential of ethanol extracts of *N. sativa* seed against normal and HeLa cells.

Many active components have been isolated from *N. sativa*, including Thymoquinone, Thymohydroquinone, Dithymoquinone, Thymol, Carvacrol, Nigellimine-n-oxide, Nigellidine, Nigellidine and Alpha-hederin. Thymoquinone (TQ), major active ingredient of *N. sativa*, has also been extensively studied and reported to possess potent anti-cancer properties. Acute and chronic toxicity studies have recently confirmed the safety of *N. sativa* oil and its most abundant active component, thymoquinone, particularly when given orally. The present work is aimed at studying the cytotoxic effect of alcoholic extract of *Nigella sativa* on cervical cancer (HeLa) and osteosarcoma (U2OS) cell lines.

Objectives:

- i. To collect, identify, authenticate and prepare *N. sativa* seeds sample.
- ii. Preparation of an alcoholic extract & phytochemical screening
- iii. Study anti-oxidant activity through DPPH scavenging activity in-vitro.
- iv. Study anti-bacterial activity against pathogenic bacterial strains.
- v. Study cytotoxic and anti-cancer activity of plant extracts on different cell lines named U2OS cell line, HeLa cell line and Normal cell line

Methods:

The dried seeds were first grinded and the fine powder then treated with ethanol. The bioactive compounds from *N. sativa* seeds were extracted using Soxhlet apparatus. The study was performed at

different concentrations such as 50µg/ml, 50µg/ml, 100µg/ml, 200µg/ml and 400µg/ml. MTT assay was carried to determine the cell viability and IC₅₀ values. IC₅₀ values for HeLa and normal cell lines were compared against standard cisplatin.

Results:

Results of the MTT assay showed that ethanolic seeds extract caused a dose dependent decrease in the HeLa cell viability (IC₅₀: 375. 2µg/ml). In contrast, other lower concentrations did not show any significant activity whereas standard Cisplatin showed effective result against HeLa cell line with IC₅₀: 25µg/ml.

Antibacterial Activity:

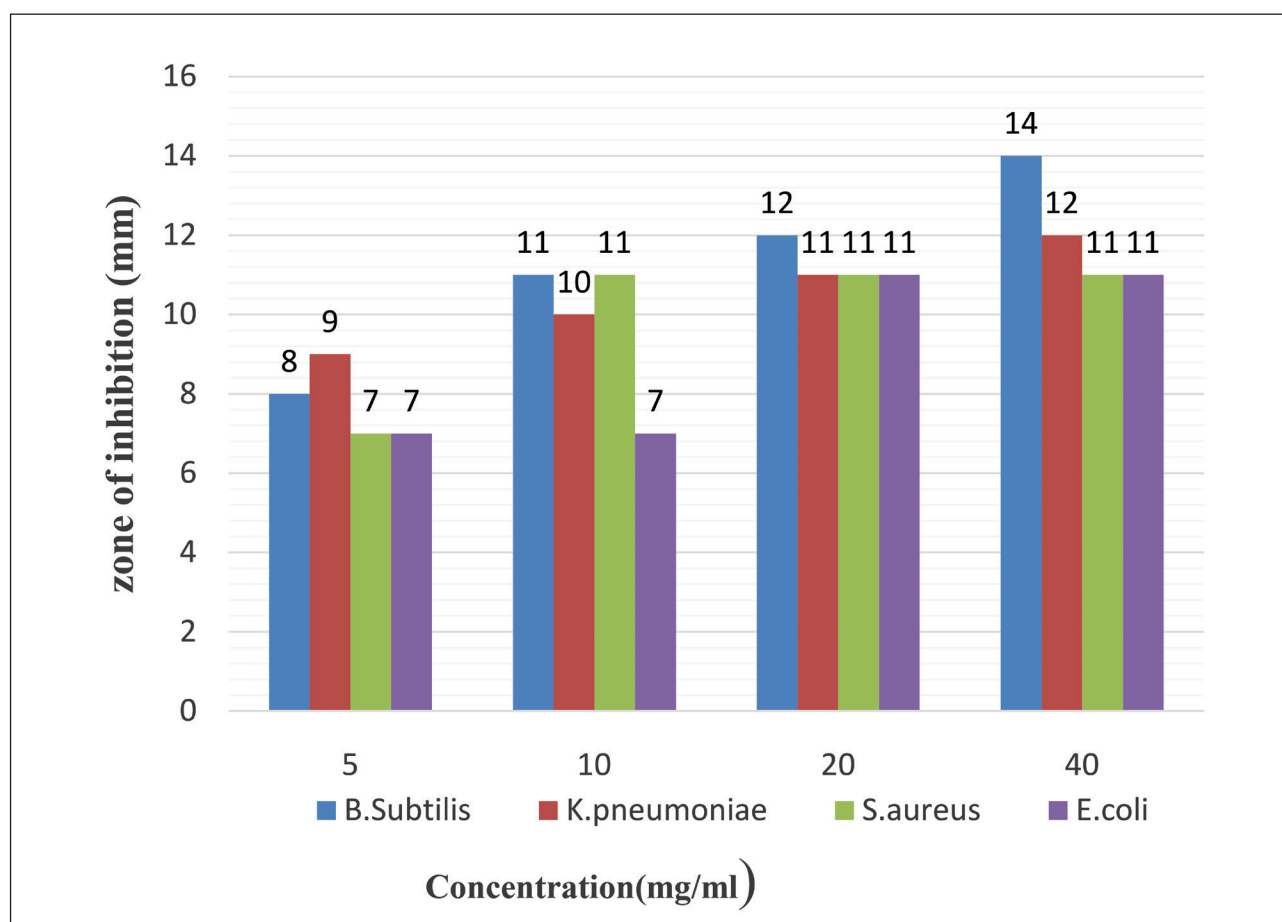


Figure: Antibacterial Activity of *N.sativa* ethanolic seed extract

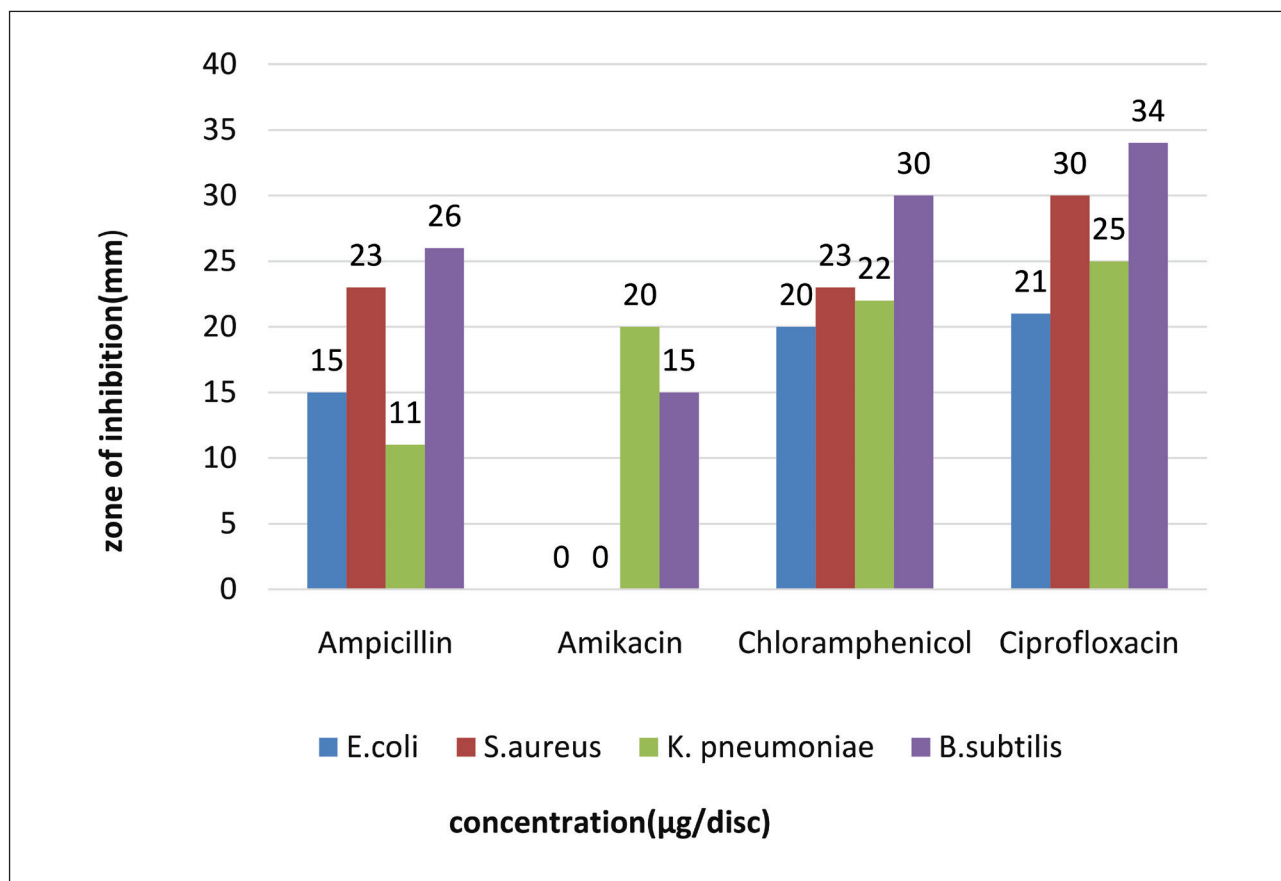


Figure: Antibacterial Activity of Standard Drugs

Antioxidant Assay:

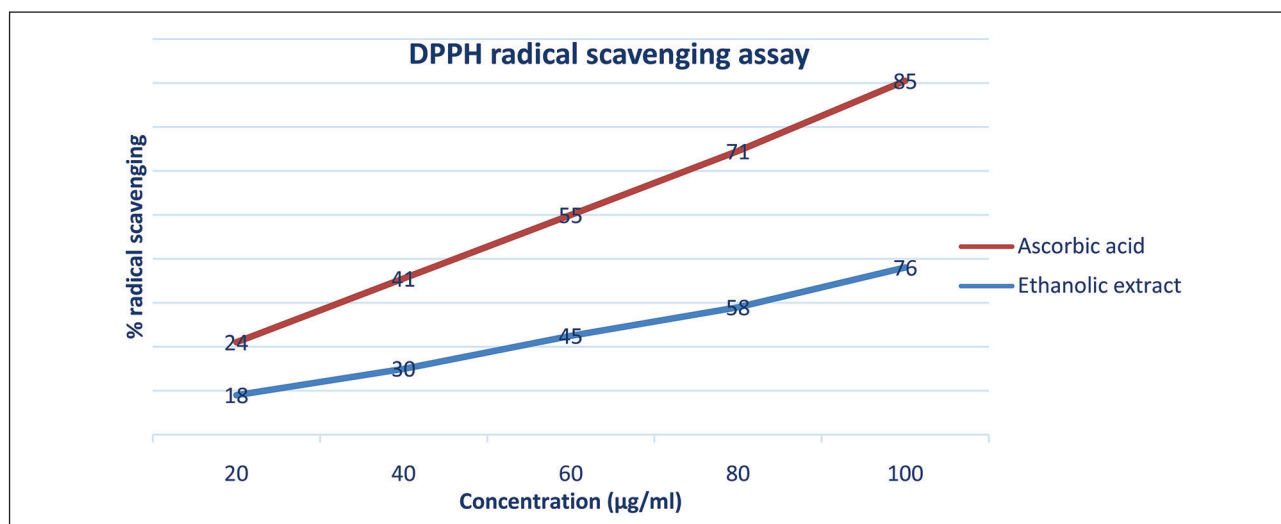
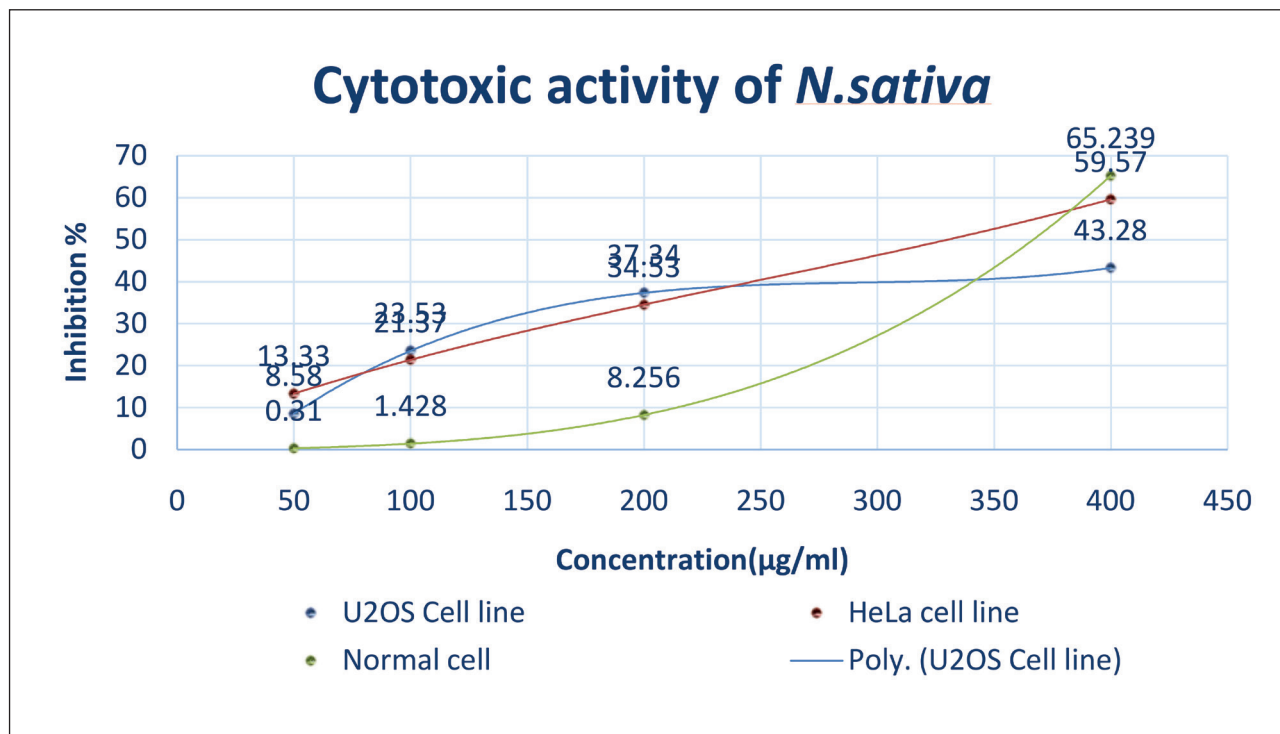


Figure: DPPH radical scavenging activity of Ascorbic acid and ethanolic extract of *N. sativa*. Ethanolic Extract of *N. sativa* seeds has shown moderate antioxidant activity in comparison to standard ascorbic acid (Red), due to the presence of high quinone and other phenolic contents.

Anticancer Activity (MTT Assay)



Cell Lines	IC ₅₀ (<i>N.sativa</i>)
U2OS cell line	476.74 µg/ml
HeLa cell line	323.80 µg/ml
Normal cell line	360.149 µg/ml

Conclusions:

This ability of the extract proved the anti-cancer property of *Nigella sativa* seeds extract and the present study enables further studies on the isolation and characterization of an anticancer molecule from the seeds of *N. sativa*. Phytochemical screening revealed the presence of chemical constituents in plants which have different therapeutic and pharmacological effect. The tested extract revealed potential antibiotic activity, However the seeds contained low antioxidants. *Nigella sativa* showed cytotoxic activity towards cervical cancer (HeLa) and osteosarcoma (U2OS) cell lines.

Published Research papers

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

1

International Journal of Collaborative Research on Internal Medicine & Public Health

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

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

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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.

Background

Anorectal disorders are one of the most common reluctant disorders and affect about one-fourth of the population [1]. Anorectal disorders are either structural or functional abnormalities of the pelvic floor in patients with symptoms, such as difficulty in defecation, fecal incontinence, rectal bleeding, anorectal pain, and rectal prolapse [2,3]. Anorectal disorders include benign conditions such as haemorrhoids to severe conditions such as anorectal cancers. The most common anorectal disorders are haemorrhoids, anal fissures, anorectal abscesses and fistulae, fecal incontinence and pruritus ani. A careful history taking of presenting symptoms, visual inspections, digital rectal examinations along with relevant tests help in diagnosis of anorectal disorders [4].

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ii. 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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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

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

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Research Article

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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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C. TRAINING ACTIVITIES

Training and Certificate Distribution

NARTC achieved its training programs set up for fiscal year 2079-80. NARTC has been conducting various trainings for Government Executives, Ayurveda consultants, Medical Officers and paramedics from various government and non governmental sectors from all 7 provinces of Nepal. Training and Workshop on Stress management for Government Executives. Anorectal Diseases and its management by Kshar-Sutra were given to Ayurveda Medical officers. Training and Workshop on Basic Panchakarma and Kshar-Sutra for Ayurveda health workers and volunteers was conducted at NARTC. Awareness program on Ayurveda was conducted for elected ward officials and female health volunteers from all 10 Wards of Kirtipur Metropolitan City. Similarly, the awareness program of Ayurveda was also conducted in Province 1 and Province 2 where more than 500 people participated. NARTC had conducted 10 Training and Workshops. A total of 256 trainee benefited from the workshops in which 210 were male and 46 were female participants. The training programs were organized on different dates within a year. Training activities are detailed below.

Event I: Ayurveda health awareness and capacity building for women health workers and volunteers

NARTC conducted training workshop on Ayurveda health awareness and capacity building for women health workers and volunteers. The purpose of the workshop was to teach women health workers and volunteers about Ayurveda health and to help them improve their knowledge and skills. The goal was to make them more aware of Ayurveda medicine. The workshop was conducted from 2079.08.13 to 2079.08.14 at training hall of NARTC in Kirtipur.

Event II: Basic Training and Workshop on Panchakarma Chikitsa

NARTC conducted training workshop on Panchakarma Chikitsa. The purpose of the training workshop was to upgrade the knowledge and skills of the participants in the overall management of diseases by panchakarma chikitsa. The training was conducted from 2079.08.21 to 2079.08.23 at training hall of NARTC in Kirtipur. The course was targeted to ayurvedic health professionals namely for ayurveda doctors, paramedics, kabiraj and vaidyas who were interested to upgrade their knowledge and skills in clinical practice by panchakarma chikitsa. 22 participants attended the training. Participants were mostly from both government and non-government sectors.





Event III: Training on Basic Training on Ksharsutra Chikitsa.

NARTC organized a training workshop on managing anorectal diseases using Kshar Sutra. The aim was to improve the participants' knowledge and skills in handling anorectal diseases through Kshar Sutra. The training took place from 2079.08.27 to 2079.08.29 at NARTC's training hall in Kirtipur. The course focused on enhancing participants' theoretical understanding of anorectal diseases and Kshar Sutra, as well as refining their practical knowledge and skills in managing such diseases with Kshar Sutra. A total of 24 trainees took part in the workshop.

Event IV: Training and Workshop on Marma Therapy and Sports Medicine

NARTC conducted training and workshop on Clinical Application of Marma Therapy for ayurveda doctors and medical practitioners from government and non-government organizations. The purpose of the training was to apprise the participants with basic application of Marma Chikitsa. The training was conducted to enhance the knowledge and skill of the participants for the dissemination of Marma Chikitsa therapy throughout various ayurveda institutions. The training workshop was conducted from 2079.09.12 to 2079.09.14 at training hall of NARTC in Kirtipur. Altogether 30 trainees underwent the workshop. Executive Director of NARTC Dr. Ram Adhar Yadav presented a paper on Fundamentals of Marma Science followed by Dr. Sirjana Shrestha's presentation on Marma Therapy of Upper Extremities.



Event V: Yoga Training

NARTC facilitated the conduction of yoga training conducted by Health Training Center, Gandaki Province. The program was conducted for 3 days from 2079.10.11 to 2079.10.17. More than 15 participants benefited from the training session. Dr. Binod Ghimire was the chief instructor in the event.



Event VI: Basic Training and Workshop on Clinical Application of Marma Therapy

NARTC conducted the training for 3 days from 2080.01.06 to 2080.01.08 where 30 Ayurveda Doctors were trained during the workshop. The participants were selected from 7 provinces of Nepal. The purpose of the training was to apprise the participants with basic application of Marma Chikitsa. The training was conducted to enhance the knowledge and skill of the participants for the dissemination of Marma Chikitsa therapy throughout various ayurveda institutions.

Event VII: Training and workshop on Management of Anorectal Diseases by Kshar-Sutra

NARTC conducted training workshop on Management of anorectal diseases by Kshar Sutra. The purpose of the training workshop was to upgrade the knowledge and skills of the participants in the overall management of anorectal diseases by Kshar Sutra. The training was conducted from 2080.01.27 to 2080.01.29 at training hall of NARTC in Kirtipur. The course was targeted to enhance the theoretical knowledge of the participants on anorectal diseases and Kshar Sutra and to upgrade the practical knowledge and skills of the participants on anorectal diseases and their management by Kshar Sutra. A total of 24 trainees participated in the workshop.

Event VIII: Stress Management Program for Executives.

NARTC conducted Stress management program for executives from the Office of the Prime Minister and Council of Ministers, Government organizations of Kathmandu valley, Department of Transport, Ministry of Health and Population and district Treasury control Office. Total of 31 executives participated in the program. The event was conducted on 2080.02.06. During the stress management session, Executive Director Dr. Ram Adhar Yadav talked about types of stress and common herbs, Dr. Binod Ghimire's focus was on Yoga and Dr. Kshitiz Sapkota put forward his take on sound healing. Dr. Sirjana Shrestha presented on Marma therapy on Stress Management. The program was focused on understanding of stress and the negative impacts of stress on job efficiency and health, Understanding strength of Yoga, Marma and Herbs according Ayurveda in the management of stress, Residential approach in the management of stress and prevention of stress induced diseases.

Event IX: Basic Training and Workshop on Panchakarma Chikitsa

NARTC organized a training workshop on Panchakarma Chikitsa to enhance the knowledge and skills of participants in managing diseases through this approach. The training took place from 2080.02.24 to 26 at NARTC's training hall in Kirtipur. The course was designed for ayurvedic health professionals, including doctors and paramedics who wanted to improve their clinical practice through Panchakarma Chikitsa. There were 28 participants from both government and non-government sectors who attended the training.





Event X: Training workshop on Emergency Management:

NARTC hosted a workshop on basic life support during emergency management, chaired by Dr. D.B. Roka, Chairman of NARTC. Welcome speech and short briefing about the program were given by Dr. Ram Adhar Yadav, the Executive Director of NARTC. Dr. Dhanik Lal Bharkher also attended the event, alongside the esteemed chief guest, Prof. Dr. Pradip Vaidya, Assistant Dean, IOM, TU. The program was coordinated by HOPE- Nepal. The program centered around the effective management of pain and stress in individuals. The focus of the program was on emergency management of first aid including, Airway, breathing and circulation. The workshop aimed to help participants better understand handling emergency management in various cases like, burning, trauma, choking, etc, enhancing their knowledge about it. It provided a great opportunity for healthcare professionals to learn more about emergency care. A total of 23 Ayurveda Medical Officers participated in the training session.

Event XI: Training workshop on Basic Panchakarma Chikitsa:

NARTC organized a workshop on Panchakarma Chikitsa to help participants, including ayurveda health professionals and paramedics, enhance their knowledge and skills in effectively managing diseases. The training took place from 2079.12.22 to 2079.12.24 at NARTC's training hall in Kirtipur. The course aimed to assist ayurvedic health professionals, such as doctors, paramedics, and kaboraj from all 7 provinces of Nepal, in upgrading their expertise in clinical practice through Panchakarma Chikitsa. The workshop had 22 participants, mostly from both government and non-government sectors.

Event XII: Visit by Delegates from the Peoples Republic of China

On June 15, 2023, a group of important representatives from the People's Republic of China visited NARTC. Dr. Ram Adhar Yadav, the Executive Director of the institution, chaired the program. The visiting team included His Excellency Hon. Mr. Chen Song, the ambassador of PR China to Nepal, Mr. Jia Xiaomeng, the team leader of the Chinese Medical Team in Nepal, and Mr. Jia Songtao from the Chinese Medical Team in Nepal. The visit primarily aimed at working together for the improvement of NARTC through mutual collaboration.

Event XIII: One day Health Camp & Dengue Test in Budhanilkanth

NARTC conducted an impactful one-day Health camp, Free Drug distribution and Dengue testing and consultation program at Bhangal, Budhanilkantha Municipality ward no. 2. This event, under the leadership of Dr. Ram Adhar Yadav, the esteemed Executive Director of NARTC, aimed at addressing the pressing healthcare needs of the local population. Hon. Former Minister of Health and population, Mr. Gagan Thapa was the Chief guest. A total of 584 patients benefited from the event. The event was conducted on Friday, 2079.06.14 BS.

Event XIV: One day Health Camp in Siraha

NARTC, with cooperation from Kalyanpur Municipality, Siraha conducted an impactful one-day Health camp, Free Drug distribution and consultation program at Kalyanpur Municipality, Siraha. This event, under the leadership of Dr. Ram Adhar Yadav, the esteemed Executive Director of NARTC, and Mayor of Kalyanpur Municipality, MR. Ram Pukar Shah. More than 600 patients benefited from the event. The event was conducted on Friday, 2079.06.29 BS.

Event XIV: One day Health Camp in Tanahu

NARTC, with cooperation from Bhanu Municipality, Tanahu conducted an impactful one-day Health camp, Free Drug distribution and consultation program at Rampurtar, Bhanu Municipality, Tanahu. This event, under the leadership of Dr. Ram Adhar Yadav, the esteemed Executive Director of NARTC. Member of Parliament Mr. Ramchandra Paudel was the Chief guest. More than 400 patients benefited from the event. One notable part of the event was how it welcomed and helped with many different health concerns. The event was conducted on Friday, 2079.08.17 BS.

Event XV: One day Health Camp in Dhanusha

NARTC, with cooperation from Hansapur Municipality, Dhanusha conducted an impactful one-day Health camp, Free Drug distribution and consultation program at Hansapur Municipality, Dhanusha. This event, under the leadership of Dr. Ram Adhar Yadav, the esteemed Executive Director of NARTC, and Mayor of Hansapur Municipality, MR. Pradip Kumar Yadav. More than 550 patients benefited from the event. The event was conducted on Friday, 2079.09.02 BS.



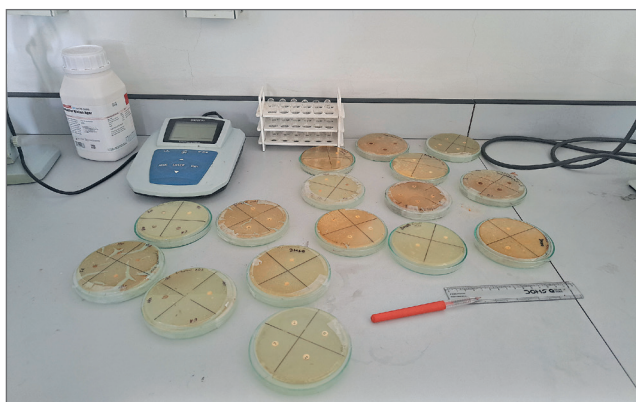
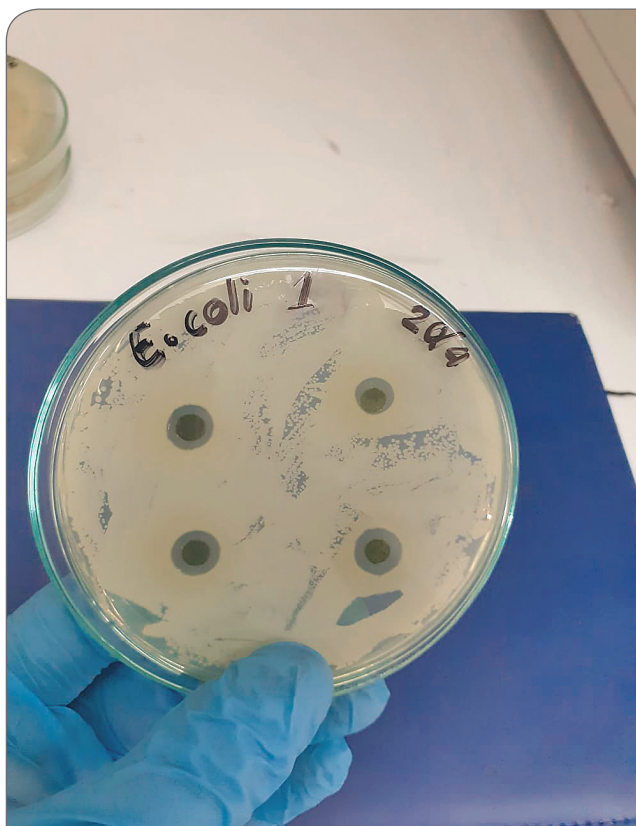
Hospital Activities



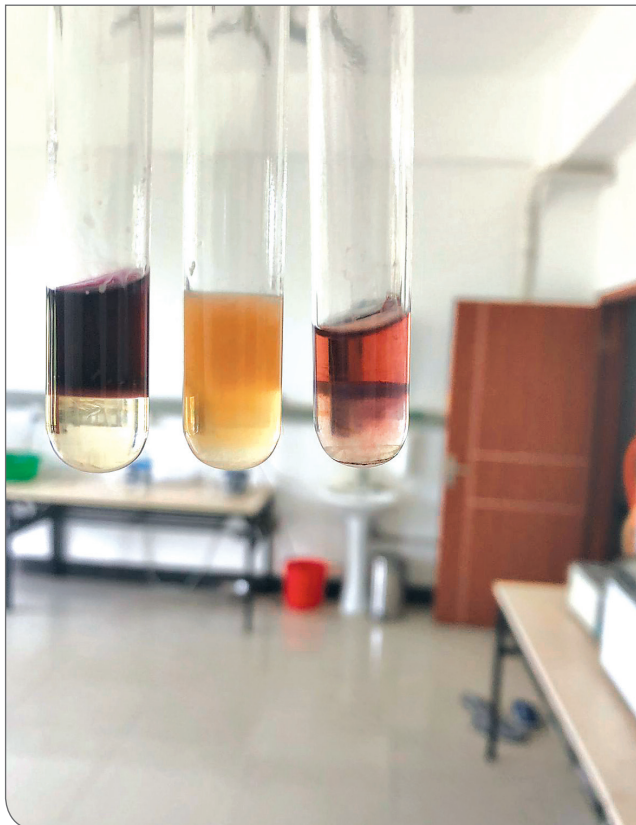
Hospital Activities



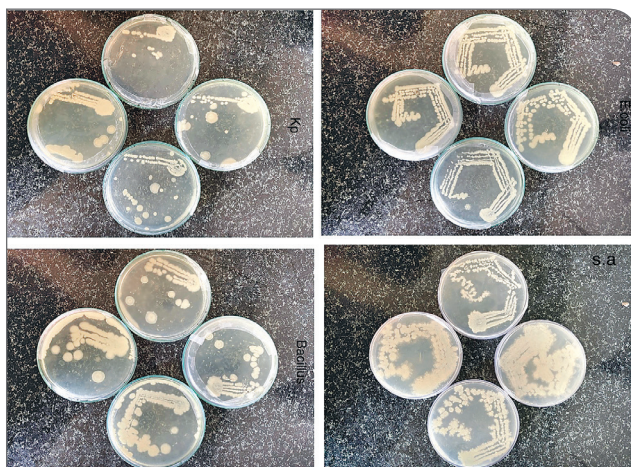
Research Activities



Research Activities



Research Activities



प्राविधिक विशेषज्ञको प्रतिवेदन

१. नमूना परीक्षण गर्ने पठाउने व्यक्ति/निकाय:- श्री Kantipur Valley College, Kumaripati Lalitpur

१(क) विद्यार्थीहरूको नाम:- Mr. Bholesh Yadav, Ms. Jenisha KC, Ms. Mamata Jaiswal and Mr. Sibesh Maharjan

२. प्राप्त नमूनाको विवरण:- वनस्पतिको नमूना ५ थान।

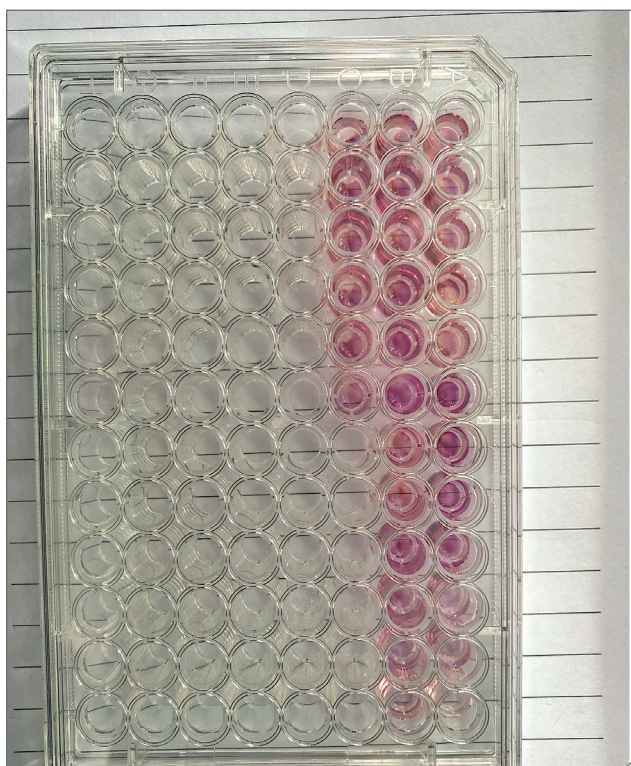
३. यस कार्यालयमा प्राप्त मिति:- २०७८/१२/१७

४. परीक्षणका आधारहरू:- (क) हर्बेरियममा भएको नमूनाहरू संगको तुलनात्मक अध्ययन ।
(ख) सन्दर्भ सामग्रीहरूको अध्ययन ।

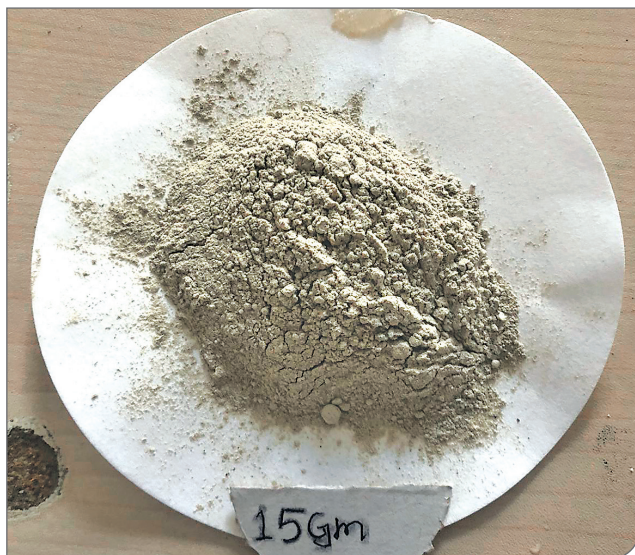
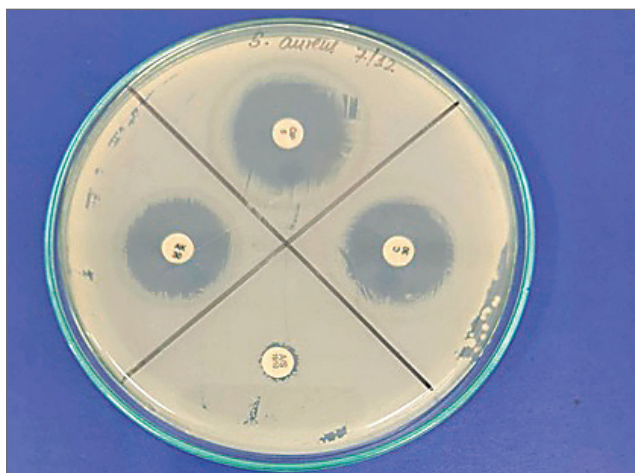
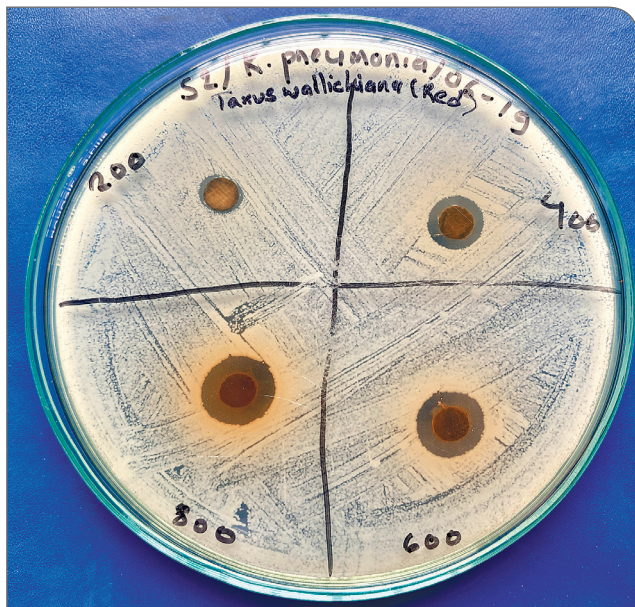
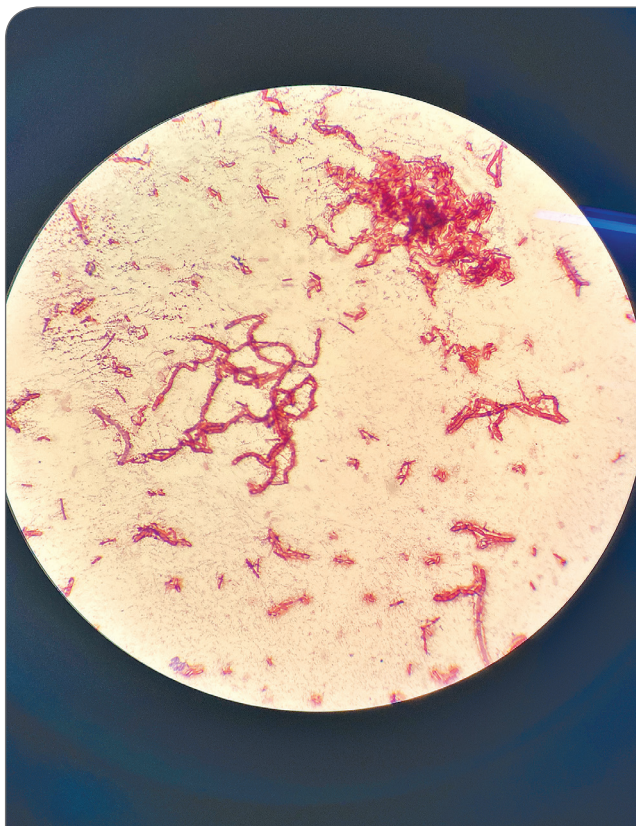
५. पहिचान प्रतिवेदन:- प्राप्त नमूनाको Morphological अध्ययन र यस राष्ट्रिय हर्बेरियम तथा वनस्पति प्रयोगशालाको हर्बेरियममा राखिएका नमूनाहरू संगको तुलनात्मक अध्ययन गर्दा उक्त नमूनाहरू निम्नानुसार पहिचान हुन गएको ।

S. No	Scientific Name	Family	Remarks
1	<i>Jasminum mesnyi</i> Hance	Oleaceae	
2	<i>Taxus wallichiana</i> Zucc. var. <i>mairei</i> (Lemee & H. Lev.) L.K.Fu & N. Li	Taxaceae	
3	<i>Nigella sativa</i> L.	Ranunculaceae	
4	<i>Urtica parviflora</i> Roxb.	Urticaceae	

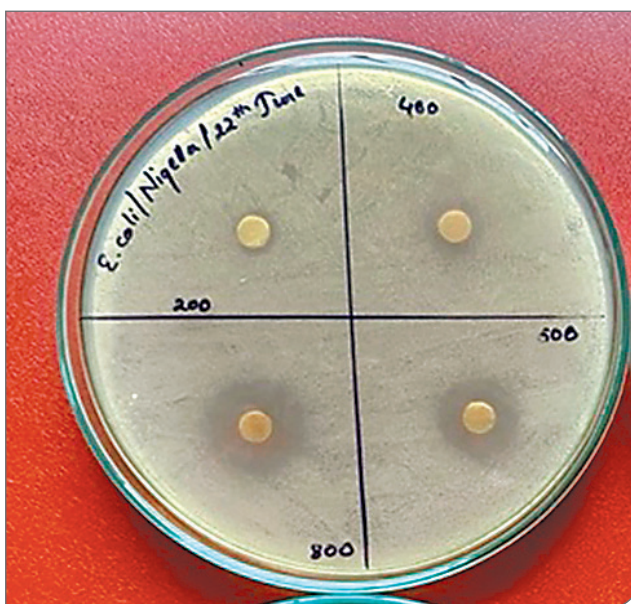
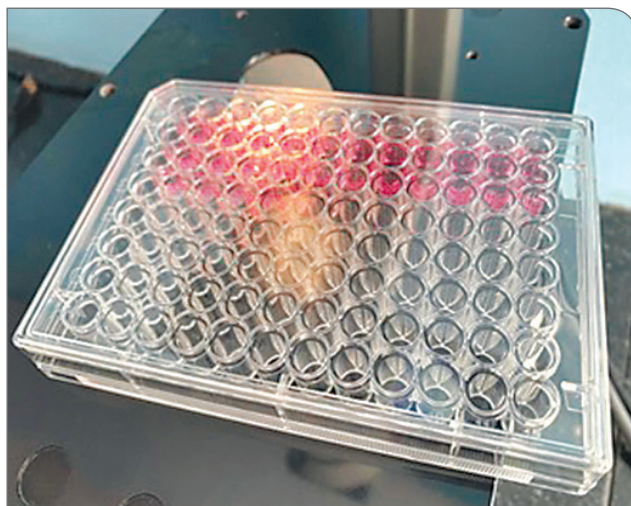
६. परीक्षण गर्ने अधिकारी:- तिल कुमारी थापा
अनुसन्धान अधिकृत
(२३३३४९)



Research Activities



Research Activities



Basic Training and Workshop on Panchakarma



Basic Training and Workshop on Panchakarma



Basic Training and Workshop on Panchakarma



Basic Training on Ksharsutra Chikitsa



Basic Training on Panchakarma Chikitsa



Basic Training on Panchakarma Chikitsa



Basic Training on Panchakarma Chikitsa



Disaster Risk Management Training



Free Medicine Distribution



Stress Management Training



Training on Ksharsutra Chikitsa



Training on Marma Therapy and Sports Medicine



Training on Marma Therapy and Sports Medicine



Yoga Training



Yoga Training



Yoga Training



Health Camp in Hansapur



Health Camp in Siraha



Health Camp in Siraha



Health Camp in Tanahu

