

Project Report

BOSCH-TDU pilot program towards building an innovative 4th non-institution, community driven tier in the National Health System

“ನನ್ನ ಉಸಿರು, ನನ್ನ ಸ್ವಾಸ್ಥ್ಯ”

“My Breath, My Health”

**Submitted by
The University of Trans-Disciplinary Health Sciences and
Technology (TDU)**

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<https://tdu.edu.in/bosch-tdu-swasthya/>

BOSCH-TDU Program on Integrative Health

ನನ್ನ ಉಸಿರು, ನನ್ನ ಸ್ವಾಸ್ಥ್ಯ (My Breath, My Health)

Project PO Number:

Bosch Limited Bangalore Plant: 0082026113 - P47

Project Period:

October 2020 to November 2021

Project Area:

Five villages in Bidadi, Ramanagara district, Karnataka, India

Project/Study Protocol Approved by:

- Institutional Ethics Committee (IEC): TDU/IEC/12/2020/PR42
- Scientific Advisory Sub-Committee (SASC), TDU
- Clinical Trial Registration No.: CTRI/2021/02/031235
(<http://ctri.nic.in/Clinicaltrials/showallp.php?mid1=51516&EncHid=&userName=Wellness>)

Project webpage:

<https://tdu.edu.in/bosch-tdu-swasthya/>

Project implemented by:

The University of Trans-Disciplinary Health Sciences and Technology (TDU) in collaboration with The Institute of Ayurveda and Integrative Medicine (I-AIM), Bangalore, India.

About TDU

The University of Trans-Disciplinary Health Sciences and Technology (TDU) (www.tdu.edu.in) is a Karnataka State Private University (Karnataka Gazettee act No: 35 of 2013) established in 2013 (also registered under 2f UGC; No.F.8-8/2015(CPP-1/PU). TDU was established as an innovation centered university focused on designing and delivering research, outreach and education focused on social transformation aligned to emerging and futuristic needs.

TDU's goal is to provide affordable, accessible and scalable solutions for unmet social needs and generate original knowledge contributions arising from the interface of Indian knowledge

systems and modern science. Both TDU and I-AIM are the products of three decades of service in traditional health and medicinal plant conservation pioneered by the Foundation for Revitalisation of Local Health Traditions (FRLHT), Bangalore, India.

About I-AIM

Institute of Ayurveda and Integrative Medicine (I-AIM) (www.iaimhealthcare.com) is the TDU research hospital. It is a NABH accredited 100 bed hospital which is being developed as an innovative model of integrative healthcare for the 21st Century. This model combines the systemic and holistic outcomes of Ayurveda with the structural and quantitative parameters of modern bio-medicine to demonstrate evidence-based Ayurveda practice.

With a vision of healthcare for home, communities and institutions, I-AIM is committed to offer the best possible patient care through a management scheme that integrates Ayurveda and judiciously with need-based physiotherapy, yoga, acupuncture, modern medicine. It undertakes systematic clinical documentation based Ayurvedic qualitative parameters as well as diagnostic and monitoring tools of modern biomedicine.

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A Villager's Testimony



Participant, Chowkahalli

"I frequently suffered from fever. I have consulted many doctors and taken medicine but there was no cure. Even if I do little household work, like cleaning, I have to take rest. After participating in this program I visited the I-IAM hospital. They gave me tablets, kashaya, taila for massage, and now I am completely alright. Almost 60 to 70 members from my village visited the I-AIM hospital and we all benefited from this program. Hearty thanks to BOSCH company. I am using all three products, by using kavala taila, kapha <phlegm> in my mouth was cleansed... snoring while sleeping <is> reduced after using nasya taila. Fever, body pain, swelling in the arms were all reduced."

(Transcribed and edited from a video testimonial).

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1) Program Objectives

1. To execute a pilot program designed by TDU-IAIM for improvement of respiratory health and wellness parameters of 250 villagers from Bidadi using Ayurveda and Yoga based interventions.
2. To collect and analyze scientific data to evaluate the efficacy of the program in enhancing wellness parameters and respiratory health
3. To design a “touch cum tech” community-based ecosystem to demonstrate reliable Ayurveda and Yoga interventions including development of tools for larger scale deployment
4. To establish a core team at TDU with capability to implement /guide similar health programs on scale.

A Villager's Testimony



Participant, Arlalusandra

“After consuming the products for 5 months, I am not suffering from any kind of fever, cough and cold. I am practicing exercises to improve my health. I have reduced the consumption of non-veg and increased the intake of vegetables. After observing improvement in my health even my neighbors were interested to participate in the program. I wish to continue the health practices in future also. Teleconsultation helped us a lot. I thank the health coach (Dr. Arpitha) for her guidance.”

(Transcribed and edited from a video testimonial).

2) Program Team



A Villager's Testimony



Participant, B. Hosur

“I used to get sour belches, sleepless nights and was feeling tired. Now, after joining this program, it has reduced. I like drinking kashaya. With the use of kavala taila gargling, bad smells in the mouth are reduced and by using nasya, my headache is reduced. The visit of the health coach, health worker and teleconsultation were truly beneficial. I wish to continue kashaya instead of tea and coffee in the future. I hope this program will continue and help a lot of other people like us.

(Transcribed and edited from a video testimonial).

3) Acknowledgements

It is BOSCH-CSR that gave TDU the opportunity to design and execute the project. Without generous funding a project of this complexity would not have been possible. Mr. Suresh BR, Senior Vice President, Country Head-HR, BOSCH-India; Dr. OP Goel, Senior General Manager, Head-BOSCH India Foundation, CSR and Skill Development; Ms. Nabila Kidwai, Senior Officer, CSR; Mr. Ashish Jain, Mr. Chetan, Mr. P. Appuswamy and field team (Dr. Kamath P, Mr. Prashanth KP, Ms. Chaitra) are acknowledged for the support and freedom to TDU.

Several individuals across various domains come together for the implementation of this project. Foremost, we would like to thank the study participants, who volunteered their time and efforts for this project. Health behavior change is a difficult process, and the full support, trust and patience of our participants is gratefully acknowledged. Direct and indirect support, and encouragement provided by the people of five villages involved in this program is also deeply appreciated.

The implementers on the ground, our health workers, Ms. Asha, Mr. Prakash, Ms. Shobha, Ms. Sudha and Ms. Sushila formed the implementation backbone of this program. Their cheerful dedication and excellent work ethic are sincerely appreciated. They formed a vital connection between the clinical team and participants, gave individual attention to all participants and ensured that their needs were communicated in a timely manner. The panchayat members provided every necessary support and helped with introducing our team to the community and motivating participants to volunteer. We also thank the Anganwadi teachers and local resource persons in this regard. Dr. Rajalakshmi, District AYUSH Officer, Ramanagara, Karnataka is acknowledged for her encouragement.

Our communication materials were made possible by Mr. Kumar Chitradurga (Anandamide Media Pvt Ltd) and Ms. Samyuktha Rao, while the video on Dinacharya practice was by Mr. SV Ojas and Mr. Vaishnav Menon. Creating health-related materials during the pandemic and in the local language was a specific challenge, and our partners helped with insights to ensure that our material resonates with the participants. We acknowledge the support of Mr. Murty (Ayurmegha team), Dr. Nirmala Murthy and Mr. Gaurav from the Foundation for Research in Health Systems (FRHS), Bangalore, for their technology support. We thank K.S Varier's Ashtanga Ayurvedics Pvt. Ltd., Trichy for manufacturing and packing of few healthcare products used in this study and Mr. Sujit of 'Spectrum' for the product kit bags.

Customised Yoga regimen for the participants was overseen by the Krishmacharya Yoga Mandiram, Chennai. The support provided for diet assessment of the participants by Prof. Mary Regi, Department of Home Science, Mount Carmel College, Bangalore is gratefully acknowledged.

Thanks are due to Prof. Darshan Shankar, Vice Chancellor, TDU and Prof. AK. Gupta, Registrar, TDU for their encouragement and inputs in program design. Dr. Narendra Pendse, a senior Ayurveda vaidya is recognized for his critical inputs on product and wellness regimen design. We received tremendous cooperation from various staff members at TDU and IAIM for project execution support (HR, Accounts, Admin and canteen teams). The field site was more than 100 km from our hospital and executing participant visits required close coordination from various departments. We also acknowledge the generous support of expertise, manpower and infrastructure from the TDU-Rural India Supporting Trust (RIST) team.

We thank the Institutional Ethics Committee (IEC) and Scientific Advisory Sub-Committee (SASC) of TDU for reviewing the program.

A Villager's Testimony



Participant, B. Hosur

"There are both bodily and mental benefits after participating in this program. My weight is reduced, my digestion has improved and overall, my immunity is strengthened. I use all the products regularly and benefited from this. Initially my neighbors were not interested to participate but after they heard from us about the program they are interested"

(Transcribed and edited from a video testimonial).

4) Executive Summary

Context

Out of pocket health expenditure claims the largest share of unplanned household income in rural India. With increases in chronic metabolic diseases and more recently, with the COVID-19 pandemic, this expenditure has only grown. One way individuals can address health needs is to empower themselves with the knowledge and practices to not only manage their disease (curative), but also to stay healthy (preventive). Ayurveda has a sophisticated concept and assessment framework for this holistic wellness contained in the term *Swasthya*. In simple terms, *Swasthya* is a state of harmony at multiple biological levels, of both body and mind. **Hence the name of this project, “Nanna Usiru, Nanna Swasthya” (Kannada) or “My breath, my health”.** The Ayurveda framework for *Swasthya* integrates *ahaara*, *vihaara* and *aushadha* - individualized diet and lifestyle guidelines, supplemented by wellness formulations and need-based detoxification therapies.

Focus

This pilot project aimed to execute a wellness and respiratory health program developed & designed by TDU-IAIM on the Ayurveda *Swasthya* framework and collect multi-dimensional health datasets to evaluate the efficacy of the program in meeting its objectives of improving respiratory health & general wellness.

Key Operational Features

The program was operationalized by providing three products for daily use, personalised dietary guidance, and yoga practices. The three products were designed based on guidelines in classical texts and contain herbs and oils. A daily decoction was to be drunk (*kashaya*), while an oil for mouth gargling (*kavala*) and oil for nasal application (*nasya*), along with instructions for use, were provided (Fig.1). Dietary and lifestyle guidelines were personalized and prescribed based on the individual's *Prakruti* (an Ayurveda system of classifying phenotypes) and current health status. The program included Yoga practices, which complement the Ayurveda framework. Yoga practices were also prescribed based on individual need assessments.

Touch and Tech

To achieve compliance and monitor progress, an ecosystem of “touch” and “tech” was created. Elements of the “touch” components included recruitment and training of local residents as health workers, who constantly monitored participants in their respective villages. The next

level of “touch” was a health coach, an Ayurveda doctor in each village, to create a trusting health ecosystem. “Touch” further included regular consultations with IAIM physicians, both physically and digitally (tele-consultation). “Tech” was utilized to capture multiple levels of data to implement, track and evaluate the program.

Data Collection

Several outputs were collated to evaluate the effectiveness of this program. These outputs were designed to capture both qualitative and quantitative parameters associated with an individuals’ sense of wellbeing. Qualitative assessments included the globally accepted WHO-Quality of Life survey and self-reporting questionnaires. Quantitative assessments included a novel Ayurveda-based questionnaire to indicate wellness, clinical tests to capture respiratory health status and laboratory-based investigations such as blood and urine tests.

Ethical Approvals

Formal approval was obtained from the Scientific and Institutional Ethics Committee. > 4,000 participants were screened and of the participants who consented, 278 were recruited based on inclusion and exclusion criteria as shown in the program process diagram (Fig. 2). Of these, 250 participated for the full duration of the program.

Field Experience

The Ayurveda interventions were well accepted by the participants which was reflected in the weekly monitoring records. Among 278 enrolled participants, about 87%, 82% and 70% of participants followed Ayurveda *Kashaya*, *Nasya* and *Kavala* practices respectively with high compliance (i.e., for more than 70% of the days during the project duration). By the end of the program 73% of participants reported practicing yoga regularly.

Outcomes

As a primary indicator, there was statistically **significant improvement in the wellness** score of participants with over 70% of the participants showing a positive outcome. This was corroborated by participants’, with ~50% reporting a positive change in health status from having “minor health issues” to “being healthy”. **WHO QoL-BREF questionnaire showed significant improvement** in two domains: 70% participants reported improvement in physical health and 64% participants reported improvement in psychological wellbeing. **60%** showed an improvement in **BOLT** (Body Oxygen Level Test), while **62%** of the participants displayed an improvement in walking capacity assessed through a **6 minutes’ walk test**. Amongst the

participants with respiratory health issues at the baseline of the program, **84%** found an improvement by the end of the study.

The above results, drawn from analysis of scientifically collected data at the beginning and end of study as baseline and end line measurements, indicate that the primary goal of “*Nanna usiru, nanna Swasthya*”, “My breath, my health” program to improve an individual’s health through contemporary application of traditional medicine has been met.

Conclusion

The high percentage (89%, n=250) of recruited participants (n=278) that completed the 6-month study based on inclusion-exclusion criteria, indicate that such a program can be embedded in people’s lives and become a habit. This level of participation establishes the efficacy of the pilot program. Furthermore, there were no adverse events during the program which show that interventions are safe. The positive results from the pilot establish a case for taking the program to a 5000 population in a second phase, wherein scalable strategies can be standardized for a mass scale program.

Future Roadmap

It is widely recognized that public health care expenditures (even at 1.2% of GDP) are woefully short for an effective ‘curative’ focused health care system that currently relies on the 3 institutionally delivered tiers of primary, secondary, and tertiary care. It is now beginning to be recognized in national policy discourse that a community based “Tier-4” that focuses on preventive, promotive aspects of health through personalized diet, yoga and home remedies can bring down overall health care costs of both families and governments.

The aim of phase 1 of the BOSCH-TDU program was to prove the efficacy of a 4th tier intervention on a pilot scale. This phase of the study cost Rs 1.55 Cr for a sample size of 250. This works out to approx. Rs. 62,000/- per participant. As the scale of the intervention increases the costs will come down and on a mass scale it should be possible to bring it down to around Rs. 1,000/family/year. The table below gives the breakup of pilot project expenditure.

Particulars	Cost per Participant (Rs.)	%
Direct Costs of Health Interventions: Cost of products, physicians, yoga trainings, transport etc.	13,600	22
Indirect Costs of Health Interventions: Administrative costs for field workers, health coaches, program co-ordinator, devices etc.	24,000	39
R & D Costs: Personal, materials	18,000	29
Data collection tools: Software development costs	6,400	10
Total	62,000	100

The cost per participant was high due to the small sample size, the research costs and the multiple data sets and the clinical datasets collected to evaluate the efficacy of the program.

Now that the efficacy of the TDU-IAIM program has been proven. The next stage of the study will focus on rolling out to a sample size of 5,000 with focus on an engagement model that relies on tech along with touch. The 2nd phase will test two things:

- Quality of data from self-administered *Prakriti & Swasthya* assessments compared to those done by trained field workers. If self-administration is proven effective, it will bring down costs even further in the 3rd phase.
- Effectiveness of a tech platform in keeping the population engaged over a 6-month period. This is also critical for bringing costs down in 3rd phase.

Many of the clinical tests that were part of the phase 1 study are not needed in the 2nd phase. The research team that was required for putting the products together and the scientific evaluation of the data is also not required for the 2nd phase. The sample size is also 20-fold higher in the 2nd phase compared to the 1st phase study which brings the per participant administrative costs down. We are also in discussions with Armman (www.armman.org), an NGO that has successfully used a full tech model to deliver maternal & child health to 26 million beneficiaries across 19 States, for using their platform. As a result, the cost per participant is expected to be under Rs. 10,000/- in the 2nd phase (see table below). The overall cost for a population 5,000 is of the order of Rs 5 cr.

Particulars	Cost per Participant (Rs.)	%
Direct Costs of Health Interventions: Cost of products, physicians, yoga	5,000	50
Indirect Costs of Health Interventions: Administrative costs for field workers, health coaches, program co-ordinator, devices etc.	3,500	35
R & D Costs: Personal, materials	1,000	10
Data collection tools: Software development costs	500	5
Total	10,000	100

The eventual goal of the program is to move to execute the model using digital technology to bring down costs substantially. Through experimentations with the digital engagement in Phase-2, we aim to arrive at the appropriate tech & touch ratio and costs to the order of Rs. 1,000/family/year (excluding products). This will be executed in Phase-3.

The rich data collected in Phase-1 will also be written up as scientific articles for publishing in peer reviewed journals. We also hope to raise funding from other sources to pursue some of the scientific questions generated through this research. A note on future research directions identified as an outcome of Phase-1 is being written as a separate document.

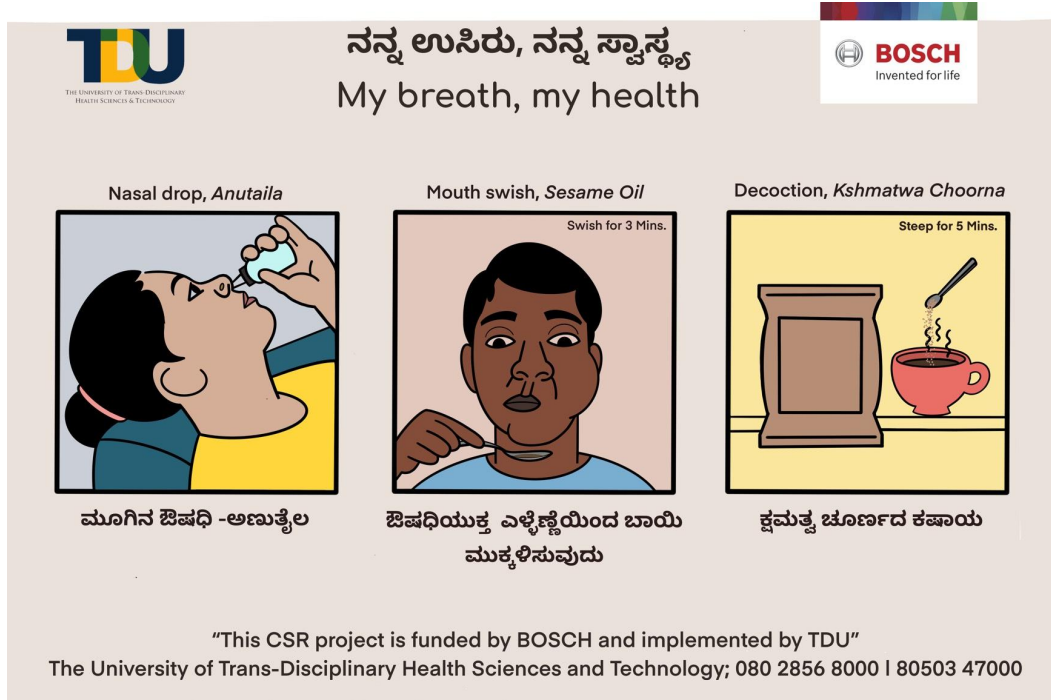


Fig 1: Ayurveda interventions followed in the Integrative Wellness Program

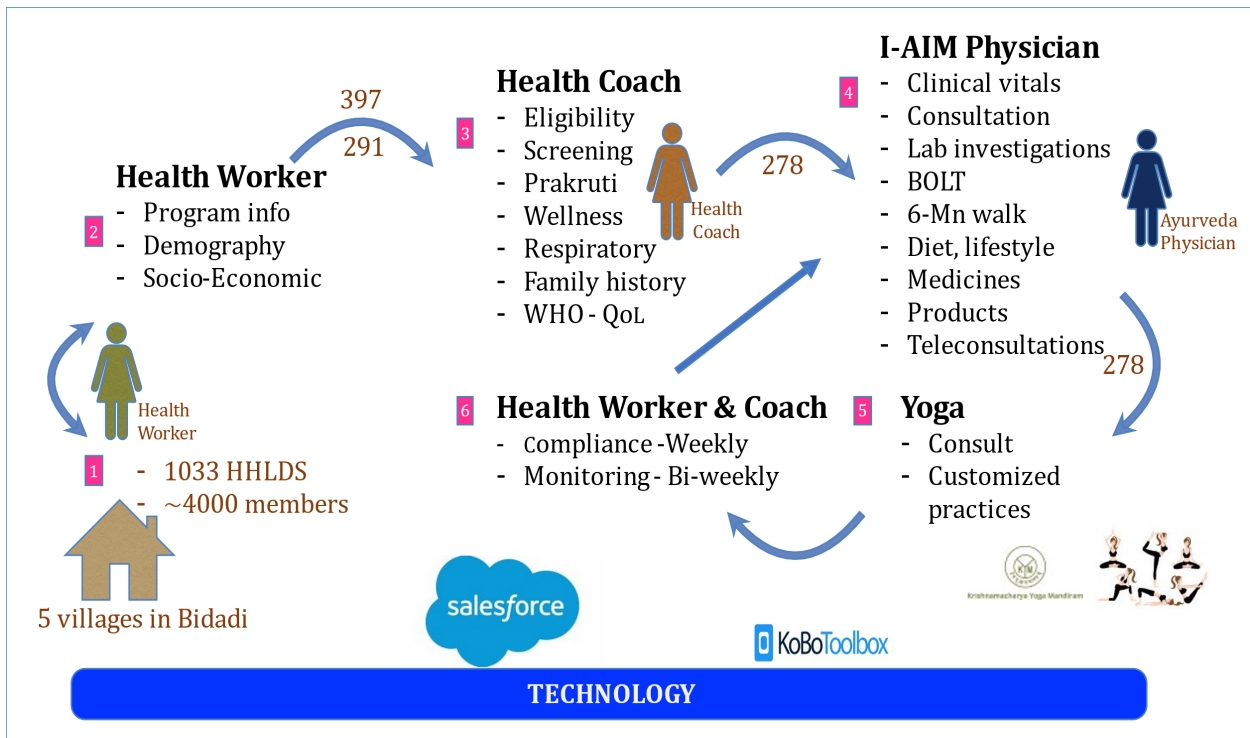


Fig 2: Elements of Ecosystem and Process

4.1) Validated Products, Tools and Capacity

The delivery of the integrative wellness program to 250 participants in the 5 villages of Bidadi, helped to validate community health-oriented products, tools and supporting communications. The results of this study show that these products and tools are successful at improving health of communities. These field validated products and tools can now be leveraged in a larger scale (~5,000 population) community health program in a next phase.

4.1.1) Products: Three thoughtfully designed Ayurvedic Wellness products for long-term convenient use (See Appendix: 1 for details)

- a) *Kshamatwam Churna*: For consumption in the form of decoction
- b) *Anu taila* (oil) as nasal medication
- c) *Moorchita tila taila* (oil) for oil pulling / swishing

4.1.2) Tools: Three *de novo* tools developed for personalised health (scalable tools for mass deployment in the next phase of the project) (See Supplementary document: 1 for details)

- a) *Wellness assessment tool*: Wellness assessment form and scoring system
- b) *Prakriti assessment tool*: *Prakriti* assessment form and scoring system
- c) *Respiratory health assessment tools*: *Assessment form*

4.1.3) Data collection tools and monitoring platform (See Supplementary document: 1 for details)

- a) *Quality of Life (QoL) assessment form* ([WHOQOL-BREF](#))
- b) *BOLT test form*
- c) *6-minutes' walk test form*
- d) *Case reporting form (CRF)*: Demography form; Participant's screening form, Family history, Lab parameters, Medicine prescription form, Adverse Drug Reaction reporting form.
- e) Yoga form, Compliance form, Monitoring form, Impact form
- f) Ayurmegha: Salesforce platform for data collection and reporting
<https://iaim.my.salesforce.com/>
- g) KoboCollect – ODK Android application

4.1.4) Communication materials (See Appendix: 2 for details)

- a) Short video on Ayurveda products administration (Kannada)
- b) Product information sheet for easy administration (Kannada & English)
- c) Product usage reminder: fridge magnet (Kannada and English)

- d) Project information brochure (Kannada & English)
- e) Short videos on Yoga postures (Kannada)
- f) SMS on health tips (Kannada)
- g) Diary having information on Ayurveda prakriti and specific diet for individual, also to record product usage (Kannada)

4.1.5) Capacity for larger scale roll out

A key output is the creation of a core team at TDU & I-AIM with demonstrated expertise of executing effective community health programs that integrate *aahaara-vihaara-aushadhaa* (diet, lifestyle & ayurvedic medicine) with modern science diagnostics of blood & urine markers and well-established clinical tests such as BOLT, 6-minute walk test etc. Capabilities of this team can be leveraged for larger scale community health programs. The unique aspect of this core team is that it has multi-disciplinary expertise (field experts, Ayurveda Vaidya's, Ayurveda researcher scientists, nutrition scientists, product developers, computer scientists & IT experts) created within TDU & I-AIM. The team has also learnt how to build capacity at the village level through health-workers.

4.2) Key Outcomes of the Program

This is a Scientifically well-designed community program to enhance the overall wellness and respiratory health of individuals and has been approved by a Scientific Advisory committee and the Institutional Ethics committee (TDU/IEC/12/2020/PR42). The study was also registered in Clinical Trial Registry - India (Registration No. CTRI/2021/02/031235). Highlights of the program can be attributed to three main aspects:

Community Participation

- a) **High compliance to the program:** Of 278 participants recruited, 265 participants complied with interventions that covered the spectrum of activities from product usage to yoga.
- b) **Enhanced health status:** Up to 67% of participants reported an improvement in overall health, which was corroborated by objective clinical assessment tools such as quality of life, wellness score, respiratory health and blood biochemistry.
- c) **Family empowerment:** > 65% of participants reported increased awareness about importance and methods of managing their own health.

Competencies Created

- a) Developed local leadership: Local residents were chosen as health workers and trained in technology as well as healthcare practices.
- b) Developed a community-responsive clinical team
- c) Developed, implemented and validated personalised health assessment tools
- d) Designed and optimised acceptance of *dinacharya* (daily regimen) practices

Digital Tools

- a) Created a 'tech' and 'touch' approach for the implementation of the project. Salesforce platform & KoboCollect tools form the technology component, whereas five health workers at the villages and five health coaches played the role of touch to effectively implement the key interventions of the project.
- b) Real Time monitoring of field, clinical activities using Sales force platform and teleconsultation
- c) Adaptation of telemedicine for community health monitoring

A Villager's Testimony



Participant, H. Gollahalli

"After the outbreak of COVID-19 everyone is suffering from cold, cough and fever. Even in my family my mother tested positive but despite being in the same house, I was not affected by COVID. Kashaya helped us a lot. Because of the products I did not suffer from cold, cough and I felt relaxed. And our village doctor <health coach> used to set up telephonic consultation which was very helpful"

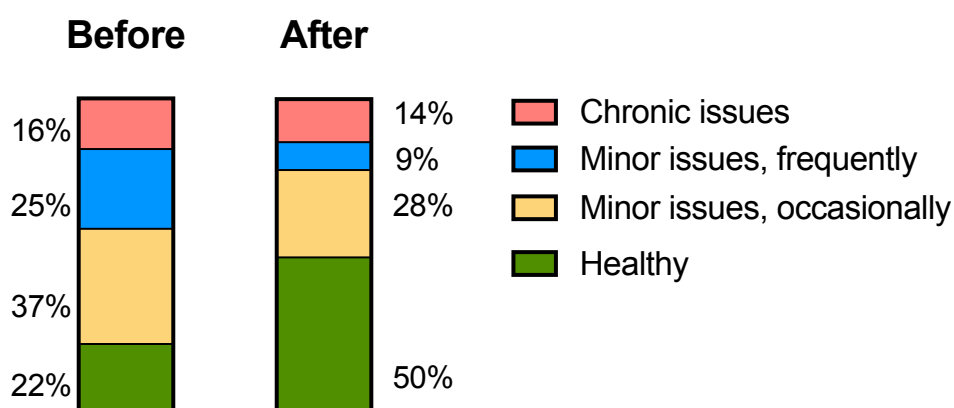
(Transcribed and edited from a video testimonial).

5) Community Perceptions

"*Swasthya*", a state of balance, is inherently individual. Thus, programmatic efforts were made to tailor advice for the individual. Impact has been assessed based on participant responses to a series of questions at the start (before) and end (after) of the intervention program. These questions were designed to understand the participants knowledge, attitude and practices associated with health.

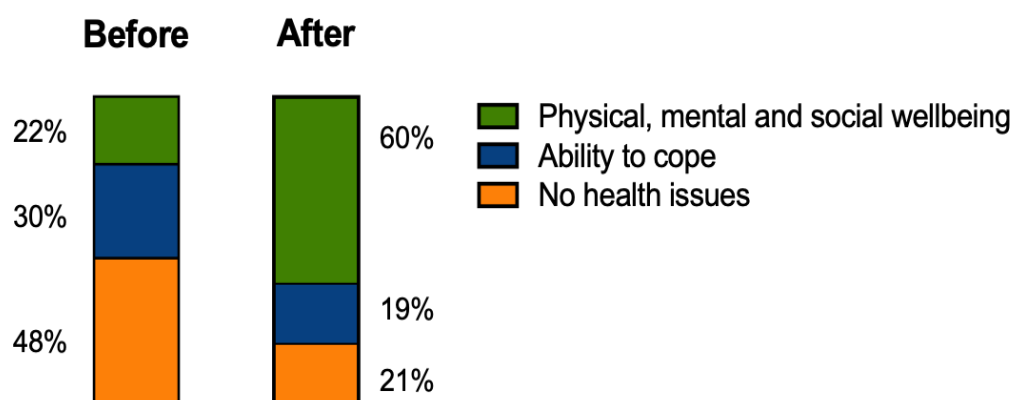
- 50% increase in participants describing themselves as "Healthy".
- 25% decrease in participants suffering from minor issues.

1



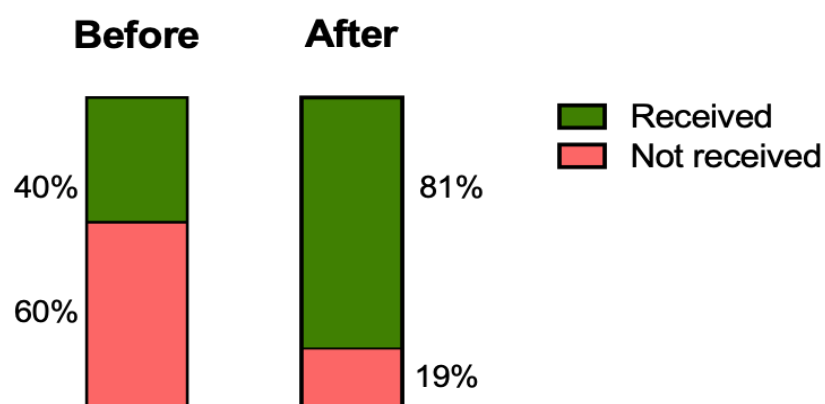
38% increase in understanding of *Swasthya* (health) as internal resilience of both mind and body, rather than mere absence of disease

2



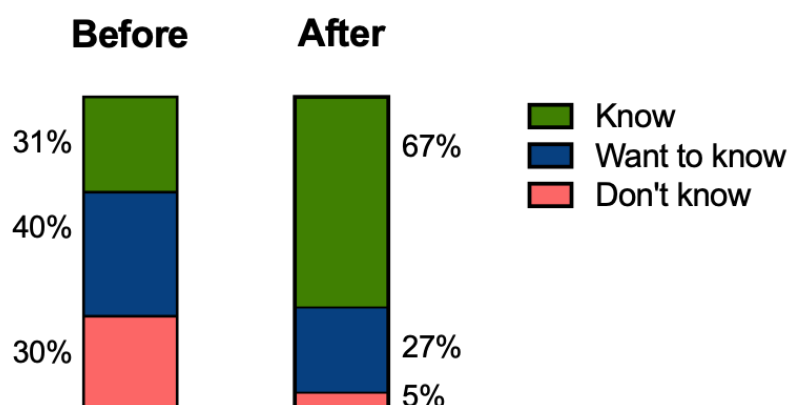
40% increase in participants who felt they received personalised dietary and lifestyle advice.

3



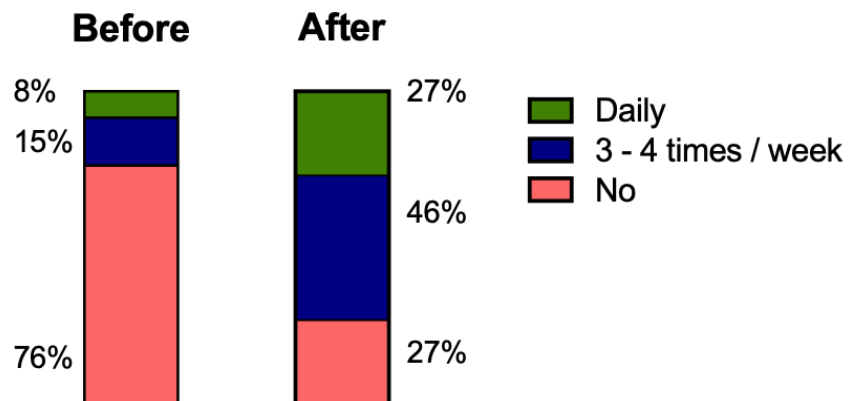
36% increase in participants who were sufficiently empowered to manage their own health

4



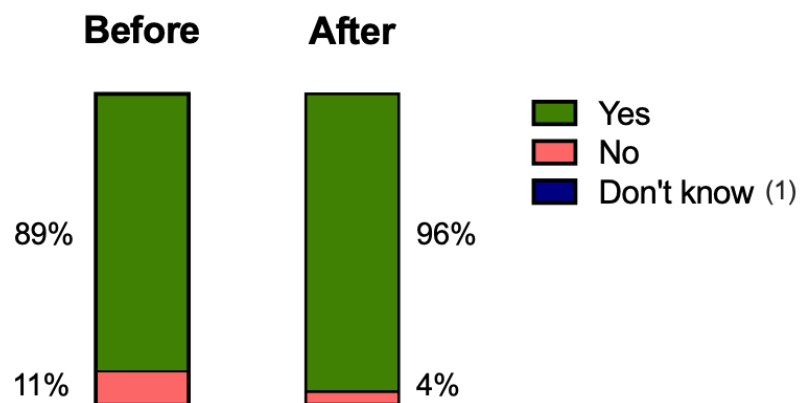
> 70% of participants performed yoga regularly after program intervention

5



95% of participants assessed the program health inventions as being helpful

6



A Villager's Testimony



Participant, Bannigiri

"From this program I am very happy, feel benefited and my health improved. Previously, I was suffering from heart burns (gastritis); after consulting here <IAIM> and taking medicines, now I don't have gastritis. Heaviness in the body, back ache, and pain in lower limbs are reduced by practicing yoga. Among the products the Kashaya and Nasya taila were easy to use, doing Kavala was a bit difficult for me but somehow I managed to do it as it is good for my health. Our respective health coaches have visited our house and advised all the do's and don'ts regarding health. Health workers visited our house regularly and monitored our product consumption. I thank BOSCH company for the beneficial program. I wish to continue the practices which I have been taught."

(Transcribed and edited from a video testimonial).

6) Societal Relevance of BOSCH-TDU Intervention

Creation of a 4th Non-Institutional Community Tier

There is a stark difference in health facilities between rural and urban India. Despite more than 65% of Indians living in rural areas, 75% of health infrastructure is located in urban areas¹. Compounding the access to resources is the inability of a majority to pay for treatments, which further erodes the capacity of rural Indians to access health care. According to NSSO data from 2006, in the years 2004-2005, out-of-pocket expenditure on health were spent on medicines (65%), ambulatory care (16%), inpatient treatment (15%) and rest on other services [National Sample Survey Organization, 2006].

While the leading causes of disability and mortality are poorly registered at the pan-India level, recent National level surveys suggest that chronic non-communicable diseases and respiratory diseases (including COPD, lower respiratory diseases & tuberculosis) are a major contributor to all-cause mortality. Using a similar verbal autopsy methodology, an investigation undertaken in Karnataka revealed that heart disease, stroke, chronic lung disease, cancer, and tuberculosis, accounted for 57% of all deaths among adult men and 55% among adult women (30 - 69yrs). Here too, (preventable) chronic & respiratory diseases top the lists of medical conditions. With one primary health center expected to act as a node to address chronic & respiratory conditions of 17,378 individuals in rural Karnataka, naturally access to information and self-management is limited (Rural Health Statistics released by Govt. of India for 2019-2020). The above situation suggests the need for empowering homes and communities to manage preventive, cost effective and self-driven health care practices. This is the meaning of the 4th tier.

This project undertook a community health ecosystem-based approach to understand if application of a traditional health knowledge framework can impact health outcomes. It appears that interventions based on the framework can be cost-effective if applied on scale and they rely on individual empowerment rather than depending on institutional services. This framework is driven by the concept of health (*Swasthya*) in Ayurveda and its rigorous application for public health.

¹ Patil AV, Somasundaram KV, Goyal RC. Current health scenario in rural India. Aust J Rural Health. 2002 Apr;10(2):129-35.

Universal access to equitable, affordable, and quality health care which is accountable and responsive to needs of people is the goal of the National Health Mission. While in the past infectious and communicable diseases such as Tuberculosis, HIV etc. were the focus. However, in recent times, the burden of NCDs such as cardiovascular disease, diabetes, respiratory disease, cancer and other chronic diseases is on the rise and accounts for 60% of mortality².

Achieving universal health coverage (UHC) requires approaches which go beyond institutional delivery of medicine, treatments, hospitals and insurance provisions. It is also clear that any single health knowledge system is not capable of providing all the health needs of the population. The need for a plural health system with a 4th community empowerment tier is becoming evident since there is a growing burden on the institutional health systems.

WHO's Traditional medicine strategy for 2014-2023 clearly states the need for harnessing traditional medicine's potential for health, wellness and people centered care³.

The pluralistic foundation within India provides the required base for integration even at home care level. Recent studies suggest that traditional knowledge systems can play an important role for planning healthcare customized to the needs and context of the society⁴.

The primary prevention of disease is a key area where traditional medicine can provide insights and help to improve understanding of health, wellbeing and nutrition. There are a number of clinical studies which show the effect of traditional medicine in preventing, curing and

² Ayushman Bharat: Comprehensive primary health care through health and wellness centres https://www.nhm.gov.in/New_Updates_2018/NHM_Components/Health_System_Stregthening/Comprehensive_primary_health_care/letter/Operational_Guidelines_For_CPHC.pdf

³Implementation of the WHO Traditional Medicine Strategy 2014-2023. <https://www.who.int/activities/implementation-of-the-WHO-traditional-medicine-strategy-2014-2023>.

⁴ Patwardhan B, Tillu G. Universal Health Coverage and AYUSH systems. J Ayurveda Integr Med. 2018 Jan-Mar;9(1):1-2. doi: 10.1016/j.jaim.2018.03.001. PMID: 29606254.

managing non-communicable diseases such as rheumatoid arthritis, cancer care and cardiovascular conditions^{5, 6, 7, 8}.

Health (Swasthya) as per Ayurveda



Ayurveda defines *Swasthya* as ‘A state of individualized homeostasis at multiple biological levels, which are, physiological functions (*sama dosha*), quality of tissues (*samadhatu*), efficiency of metabolism (*samaagni*), optimum excretory process (*sama mala kriya*) and the contentedness (*prasanna*) of the sensory and mental states (*indriya*) (*Sushruta Samhita*).

⁵ Park J, Ernst E. Ayurvedic medicine for rheumatoid arthritis: a systematic review. *Semin Arthritis Rheum*. 2005 Apr;34(5):705-13.

⁶ Kessler CS, Pinders L, Michalsen A, Cramer H. Ayurvedic interventions for osteoarthritis: a systematic review and meta-analysis. *Rheumatol Int*. 2015 Feb;35(2):211-32.

⁷ Biswal BM, Sulaiman SA, Ismail HC, Zakaria H, Musa KI. Effect of *Withania somnifera* (Ashwagandha) on the development of chemotherapy-induced fatigue and quality of life in breast cancer patients. *Integr Cancer Ther*. 2013 Jul;12(4):312-22.

⁸ DuBroff R, Lad V, Murray-Krezan C. A Prospective Trial of Ayurveda for Coronary Heart Disease: A Pilot Study. *Altern Ther Health Med*. 2015 Sep-Oct;21(5):52-62.

A Villager's Testimony



Ms. Asha, Health Worker, Bannigiri

"This program benefited our village people. They used to go out for blood check-up, consultation and medicine but here they get all these things for free. Doctors used to visit the house and give them health advice. Initially people were unaware of the ayurvedic system and afraid to take ayurvedic medicine but by this program people got used to the system. Many health problems like loss of appetite, headache were reduced. Even I came to know about Ayurveda by working on this project. Being in the same village I did not mingle with many village people. By working on this project, I started to mingle with the people and came to know many details about them. Doctors helped us to know about many health-related matters"

(Transcribed and edited from a video testimonial)

7) Detailed Insights into Program Methodology

7.1) Design for Continuous Community Engagement

The program was designed to have continuous engagement with 250 individuals who are health seekers, recruited after the screening mechanism through baseline measurements, to provide Ayurveda and Yoga based interventions to enhance their wellness and respiratory health as measured at the end of the program duration (Fig. 3).

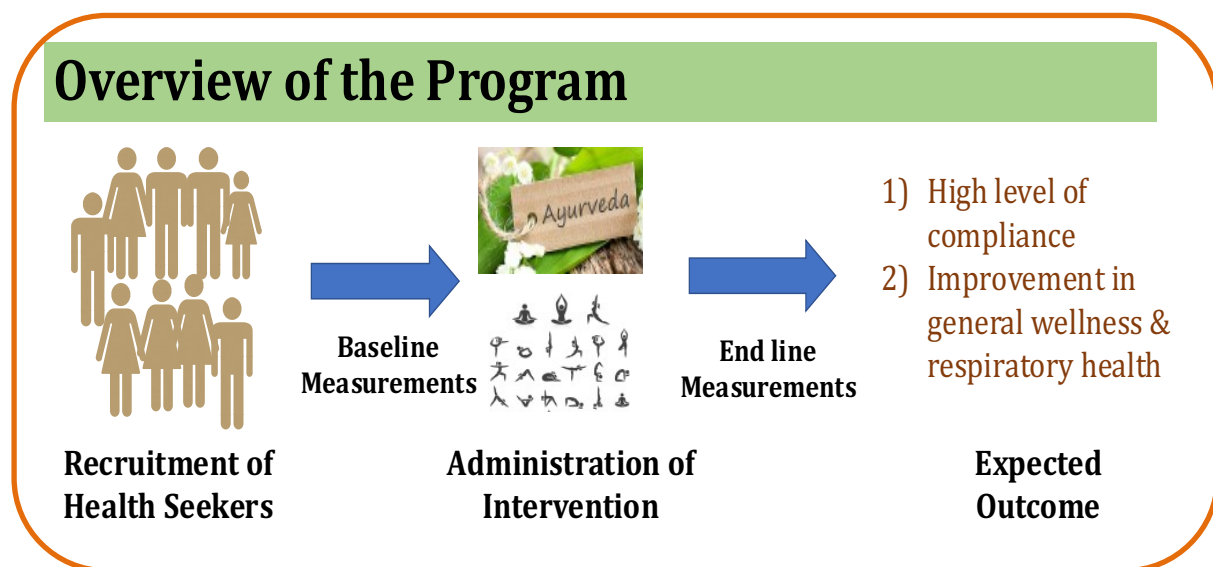


Fig 3: Overview of the Integrative Wellness Program

7.2) Multiple Arms of Strategy

The program integrated human resource personnel and services across several domains. Fig.4 elaborates the complex system that was set up to execute the program. Five core elements were identified to execute the program.

- i) **Field:** This consisted of 5 health workers, and 5 health coaches, one per village, to coordinate field-clinic activities and monitor 278 volunteers. A field office in Byramangala was setup to facilitate monitoring.
- ii) **Clinical:** At IAIM hospital blood samples were tested, and physicians reviewed health markers, provided Ayurveda consultation (medicines, diet and lifestyle) including tele-consultations and monitored health status. A yoga instructor taught and provided customized yoga practices.

- iii) **Product:** Three specific Ayurvedic products were designed, raw materials procured, prepared. All the 278 participants received the products for 6 months. Participant feedback was reviewed regularly to refine products, if needed.
- iv) **Communication:** Various communication materials were developed to recruit participants. Further information in different formats (digital and print) was developed to support and encourage participants to sustain their behaviour change activities.
- v) **Technology:** Digital platforms using Salesforce and KoboCollect were customized for data acquisition, clinical monitoring and data analysis

7.3) TDU-IAIM Planning

Three main stages were identified as a part of the study procedure (Fig 5).

Stage 1: Preparation of clinical protocol and approval by Institutional Ethics Committee. Product, technology and communication material development. Operationalization of implementation plan.

Stage 2: Field monitoring and distribution of products. In parallel, participant visits to I-AIM for consultations.

Stage 3: Data analysis and project report writing

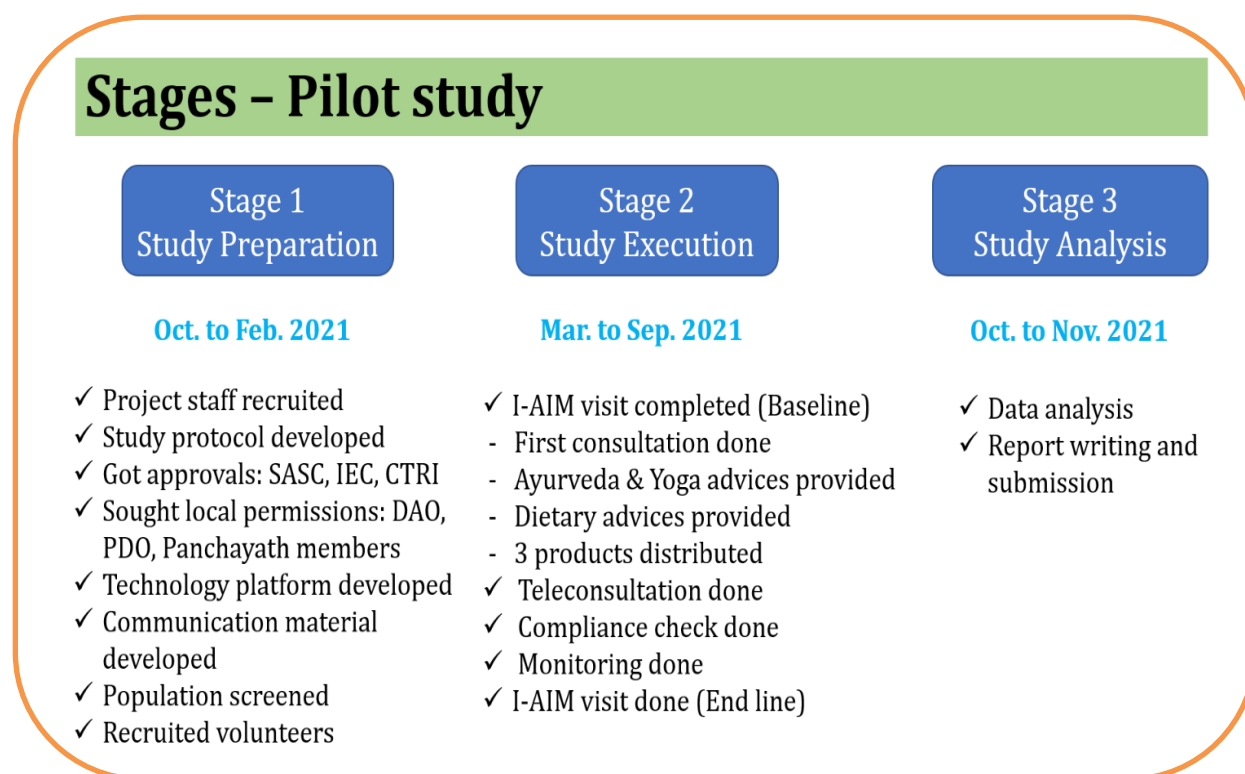


Fig 5: Three stages of the study and specific activities completed in the project period

TDU-BOSCH Program on Integrative Health Sciences : "Nanna Usiru, Nanna Swasthya"

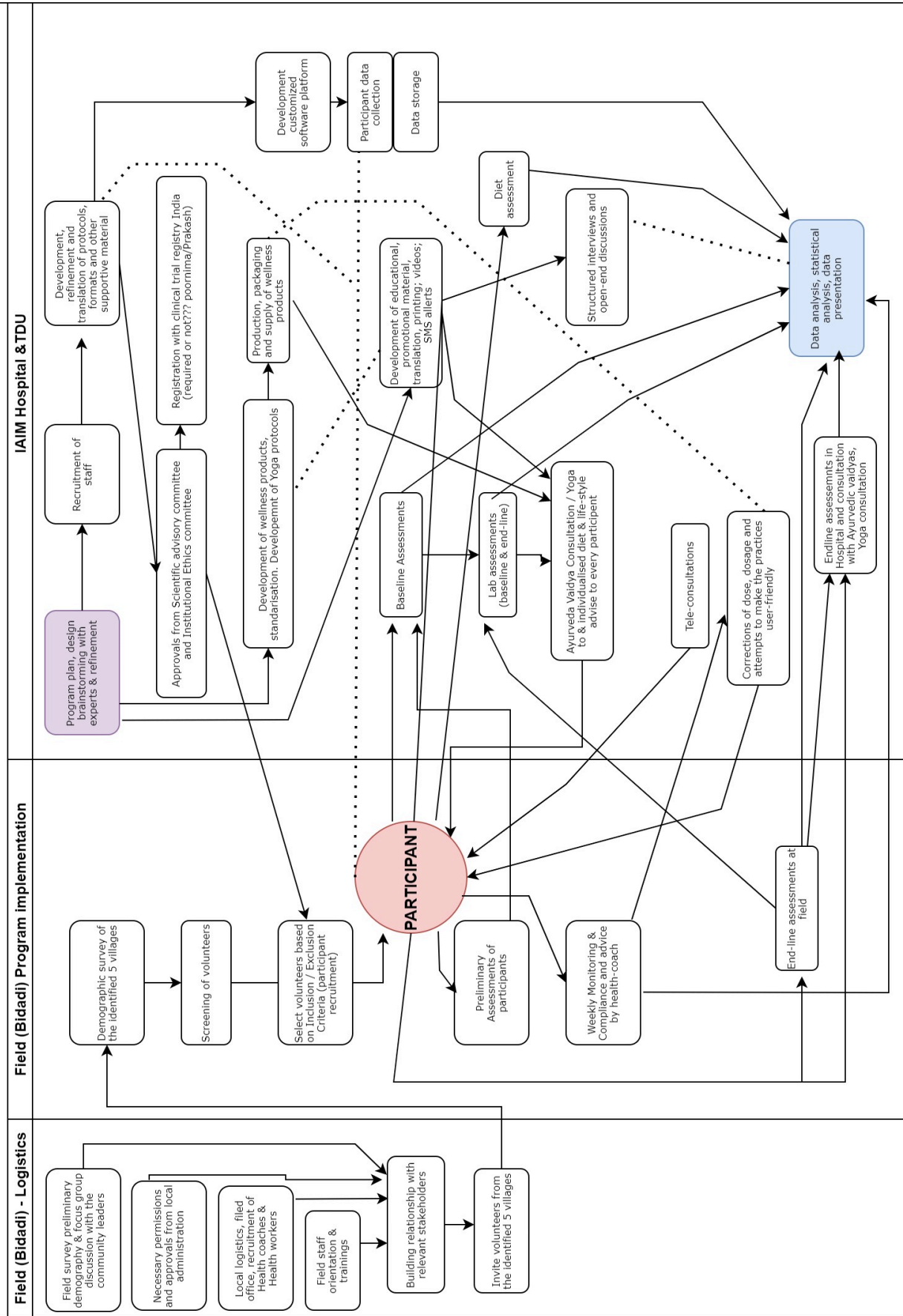


Fig 4: Schematic representation of the program on Integrative Health Sciences: *Nanna Usiru, Nanna Swasthya*