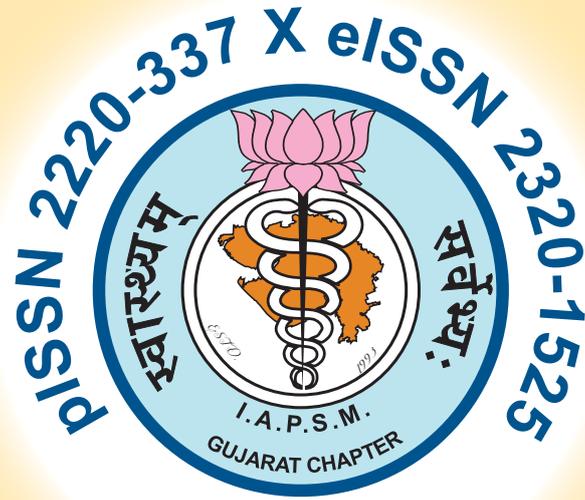


# HEALTHLINE

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JOURNAL OF INDIAN ASSOCIATION OF  
PREVENTIVE & SOCIAL MEDICINE-GUJARAT CHAPTER

## HEALTHLINE JOURNAL

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Volume 7 Issue 1 (January - June 2016)

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## Social and Behaviour Change Communication – Essential Component of Contemporary Health Care

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### Introduction:

Health is created through the interplay of many determinants, which include social determinants too. These social determinants include factors such as knowledge, attitudes, norms, beliefs and cultural practices. Social and Behaviour Change Communication programs (SBCC) use the most powerful and fundamental human interaction – communication – to positively influence these social dimensions of health and well-being. SBCC is a process that motivates people to adopt and sustain healthy behaviours and lifestyles. Sustaining healthy behaviour usually requires a continuing investment in Behaviour Change Communication (BCC) as part of an overall health program.

In this context, communication goes beyond the delivery of a simple message or slogan. It encompasses the full range of means through which people, individually and collectively, can be motivated to cultivate healthy lifestyle.

### What is SBCC?

Social and Behaviour Change Communication is the use of communication to change behaviours, including service utilization by positively influencing the knowledge, attitude and social norms.<sup>[1]</sup>

The shift in terminology from Behaviour Change Communication (BCC) to Social and Behaviour Change Communication (SBCC) is a recent milestone in health communication that reflects renewed emphasis on improving health outcomes through healthier individual and group behaviours as well as strengthening the social context, systems and processes that underpin health.

BCC efforts have focused on individuals' behaviour change because the most widely used theories emphasize the individual level.<sup>[2]</sup> However, a growing understanding that behaviours are

grounded in a particular socio-ecological context and change usually requires support from multiple levels of influence resulted in an expansion of the approach to become SBCC.

The addition of an 'S' to BCC aims to bring the field closer to the recognition of the need for systematic, socio-ecological thinking within communication initiatives.<sup>[3]</sup>

### Components of SBCC<sup>[3,4]</sup>

SBCC encompasses three core elements:

- Communication using channels and themes that fit to target audience's needs and preferences.
- Behaviour Change through efforts to make specific health actions easier, feasible, and closer to an ideal that will protect or improve health outcomes.
- "Social Change" to achieve shifts in the definition of an issue, people's participation and engagement, policies and gender norms & relations.

### Need for SBCC

- Strengthening community responses to issues
- Influencing decision-makers and family and peer networks
- Increasing demand for health services and products
- Increasing correct use of health services and products
- Influencing policy
- Capacity building for local planning and implementation of health improvement efforts

### Steps in the implementation of an SBCC program

- Analyse the Situation
- Know Your Audience (primary audiences/ influencing audiences)

- Specify Communication Objectives
- Selecting Strategic Approaches
- Positioning and Strategy Outline
- Formulating Implementation Plan
- Monitoring and Evaluation
- Feedback for Further Improvement

**Approaches for SBCC**

Once the communication objectives have been determined, the strategic approaches will used to achieve the communication objectives. Often a communication strategy will include several approaches, especially if addressing multiple audiences across the social-ecological levels.

Often the campaigns include a combination of approaches (usually including mass media, in addition to community-based approaches) and provide multiple opportunities for exposure through a consistent theme that links program activities

together. A campaign provides benefits to the individual and/or society, typically within a given time period, by means of organized communication activities.

Following is a list of some of the strategic approaches:

- Advocacy
- Community-Based Media
- Community Mobilization
- Counselling
- Distance Learning
- Information and Communication Technology (ICT)
- Interpersonal Communication (IPC)/Peer Communication
- Mass Media
- Social Mobilization
- Support Media/Mid-Media

**Selection of the approach for SBCC <sup>[5]</sup>**

CONSIDERATIONS	APPROPRIATE APPROACHES
Complexity of the Challenge	Face-to-face communication, Mass media Popular social media channels –Facebook, Twitter, and Whatsapp among others. Written materials (for referral and re-referral)
Sensitivity of the Challenge	Interpersonal approaches and one-on-one communication
Effectiveness of Approach to Address Challenge	Some examples-Entertainment education is well suited for motivational messages and moving social-norms, face-to-face counselling seems to help people learn about and adhere to more effective strategies to quit smoking, media campaigns were better than interpersonal interventions without media for HIV/STD prevention.
Literacy	If audience is not literate, an approach, which does not rely on the written word, will be more effective.
Desired Reach	Mass media, most internet-based interventions and many mHealth interventions have an advantage in their potential reach and can provide regional and national coverage.
Cost	Consider the cost – and cost effectiveness.
Innovation	Consider using approaches that are new / appealing/ interesting and fresh for the audience.
Youth	Some mobile-based or social-media based approaches may appeal more to young adults.

Often there is great confusion about the approach, which will suit a particular SBCC campaign. However, depending on the communication objectives and target audience, the following methods may be suitable for SBCC activities.

### Scope of SBCC

Often it is required to apply various communication approaches ranging from mass communication, entertainment education, interpersonal communication, participatory development communication, advocacy and social mobilization for the programs.

Communication programs need to be responsive to peoples' wants, needs and desires. Additionally, communication programs must be geared to stimulate social change in more effective ways through careful communication research, analysis, planning, co-ordination, implementation, management, monitoring and evaluation.<sup>[4]</sup>

SBCC has proven effective in several health areas, such as increasing the use of family planning methods, preventing HIV and AIDS, non-communicable diseases, mental illnesses, drug abuse, genetic disorders, reducing the spread of malaria and other infectious diseases, improving newborn and maternal health, adolescent health and much more.

Well-planned social mobilization efforts also seek to empower communities to take control of their own situations, including accepting or rejecting interventions. Social mobilization, integrated with other communication approaches, has been a key feature in numerous communication efforts worldwide.<sup>[6-10]</sup> However we have to see the ethical issues while considering SBCC strategies and programs for any community. There is no limit to the aspect of the healthcare and the way various strategies can be used for SBCC. Many studies in the field of nutrition have described the uses of mHealth and eHealth strategies.<sup>[6,7]</sup>

In a study by Willis E and Royne MB, it was observed that online health communities act as informal self-management programs led by peers

with the same chronic disease through the exchange of health information. Online health communities provide opportunities for "health behaviour change messages" to educate and persuade regarding chronic disease self-management behaviors.<sup>[11]</sup> It is also observed that SBCC/BCC represents an integral component of malaria control efforts.<sup>[12]</sup>

In a study in the field of management of childhood diarrhoea, among the main strategic options that was suggested for relieving the bottlenecks included one option - to develop Information Education Communication/Behaviour Change Communication (IEC/BCC) plan for childhood diarrhoea management at state/district level.<sup>[13]</sup>

In a study on community-based maternal, newborn and child health services in rural areas of India, the components of the intervention (mHealth strategies), were designed to overcome the gaps in care.<sup>[14]</sup>

Mobile phone messaging is an inexpensive option to deliver educational and motivational advice about lifestyle modification. In a study by Ramchandran A et al, it was assessed whether mobile phone messaging that encouraged lifestyle change could reduce incident Type 2 diabetes in Indian Asian men with impaired glucose tolerance.<sup>[15]</sup>

These are only a few examples of use of SBCC for tackling diverse health problems. One should meticulously prepare SBCC program cycle, budget, understand the audience profile, ensure good quality material, consider the 7 Cs of communication in public health, learn to work with news media and evaluate the program after implementation.<sup>[16,17]</sup>

However, we must remember that effective communication is only one of the many aspects that need to be look in to influence people and groups for a particular health or programmatic outcome. While it is one of the many cogs in the wheel of providing effective healthcare, it is a vital cog- one sets and keeps the aforementioned wheel in motion.

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## Road Traffic Injuries: Challenges and Safety Measures

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### Introduction:

India is currently experiencing the triple burden of diseases viz. communicable diseases, non-communicable diseases and injuries.<sup>[1]</sup> India is having one of the largest networks of roads in the world, which is important indicator of economic development of a country. Rising population, inadequate planning and expenditure contributes to number of road accidents, injuries and fatalities.

A Road Traffic Accident (RTA) can be defined as, an event that occurs on a way or street open to public traffic; resulting in one or more persons being injured or killed, where at least one moving vehicle is involved.' Thus RTA is a collision between vehicles; between vehicles and pedestrians; between vehicles and animals; or between vehicles and geographical or architectural obstacles. Different road transport modes include four wheelers, motorized three wheelers, motorized two wheelers, bicycles and pedestrians.

An "injury" is defined as 'a body lesion at the organic level resulting from acute exposure to energy (mechanical, thermal, electrical, chemical or radiant) interacting with the body in amounts or rates that exceed the threshold of psychological tolerance. Unintentional injuries consist of that subset of injuries, for which there is no evidence of predetermined intent. The cause-specific intentional injuries for which the World Health Organization routinely analyses & publishes data include road traffic injuries (RTI), domestic injuries that include poisonings, falls, burns and drowning.

Road traffic mortality is any death for which a severe road traffic injury is the underlying cause. The "underlying cause" of a death is the disease or injury which initiated the train of events leading directly to death regardless of how long ago the event occurred. Note that there is no time limit between the crash and

the death. There is also no restriction on where the death happens (at crash scene, hospital, home, etc).

RTIs incur a huge burden on economy and on health department in terms of pre-hospital and acute care and rehabilitation with a greater share of hospitalizations, deaths, disabilities and socio-economic losses in young and middle age populations. RTIs are included under unintentional injuries. A road traffic injury is an injury caused in a road traffic crash. "Injury" is the reduction in functional health status due to energy exchanges that have relatively sudden discernible effects.<sup>[2]</sup>

Learning objective of this CME is to describe major concepts in road traffic injuries & outline the major global and Indian scenario and its public health implications with highlight on the key risk factors & basic elements of public health approach and Haddon matrix in reference to road traffic injuries.

### Burden of RTIs

The Global Burden of Disease (GBD), injury and risk factor study provides global patterns of mortality and disability, the state of the global health. GBD provides largest and most comprehensive systematic epidemiological estimates for 150 major health conditions from 1600 GBD collaborators across 120 countries. GBD minutely examines causes of death, and is unique in its inclusion of disability. It also provides indispensable global and regional data for health planning, research and education. Disability Adjusted Life Years (DALY) assesses overall burden of diseases. Road injury is the ninth leading cause of deaths in the world. Injuries cause over 15 percent of death and disability.<sup>[2]</sup>

### Worldwide

The worldwide rate of unintentional injuries is 61 per 100,000 populations per year. Overall, road traffic injuries make up the largest proportion of unintentional injury deaths (33%).<sup>[3]</sup>

Every year approximately 1.3 million deaths results from road traffic accident, which is more than 3000 deaths per day! In addition, 20-50 million non-fatal injuries results from a collision and these injuries are important causes of disability worldwide. RTIs are among the top three causes of death between 5 to 44 years of age.<sup>[4]</sup>

During 2008, RTI ranked fourth among the leading causes of death in the world.<sup>[5]</sup> Road traffic injuries are the leading cause of death among young people aged 15-29 years and cost countries 1-3% of the gross domestic product (GDP). Half of those dying on the world's roads are 'vulnerable road users': Pedestrians, cyclists, and motorcyclists.<sup>[6, 7]</sup> Only 28 countries, representing 416 million people (7% of the world's population), have adequate laws that address all five behavioral risk factors (speed, drink-driving, helmets, seat-belts, and child restraints). Hence, the goal of the United Nations' Decade of Action for Road Safety 2011- 2020 is to save five million lives. [8] Road injury accounts for 75.5 million DALYS in 2010, up from 56.7 million in 1990.<sup>[9]</sup>

## India

Based on Global status report on road safety 2013 more than 2, 31,000 people are killed in road traffic accidents (RTAs) in India every year. Nearly half of all deaths on the roads are amongst vulnerable road user's viz., motorcyclists, cyclists and pedestrians.<sup>[10]</sup>

In India and South-East Asia, injuries account for an estimated 15% of total deaths and 15% of DALYs. Consequently, an estimated 1.5 million people die, as a result of injuries and 15-20 million are hospitalized with resulting economic losses of 3% of GDP for the country.<sup>[11]</sup> Tamil Nadu, Maharashtra and Madhya Pradesh are states showing trend with highest number of road accidents from 2010-13 while Uttar Pradesh, Tamil Nadu and Andhra Pradesh reported maximum number of person killed during the same period. Goa had maximum number of road accidents per lakh population while Lakshadweep had lowest. Two wheelers (28.6%) are the most unprotected road users followed by Car/Jeep/Taxis (22.2%) and Truck / Tempo (21.1%). Time period between 3:00 pm to 6:00 pm shows highest rate of

accidents. Ratio of total accidents during day time (6 am to 6 pm) to night time (6pm to 6 am) is 3:2.<sup>[12]</sup>

## Reasons for Increasing Burden of Road Traffic Injuries

Road traffic crash occurs as a result of multiplicity of factors and the way they interact, viz. components of the system including roads, vehicles, road users and the environment. While some factors contribute directly to the occurrence of a collision, thus are part of crash causation, the other factors aggravate the severity of the crash and thus contributes to the consequences of trauma. Some factors are indirectly related to road traffic injuries, some causes are immediate, but may remain unnoticed by medium-term and long-term structural causes. Understanding complexities of interrelated risk factors that contribute to road traffic collisions are important in prioritizing interventions that can reduce the risks associated with those factors.<sup>[11]</sup>

Identifying transport modes, patterns and needs is essential for ensuring road safety. The overcrowding of vehicles on roads is due to overwhelming growth of the vehicle industry, liberalized government's economic policies, increasing purchasing power of people, easy availability of loans, aggressive media campaigning, and poorly developed and maintained public transport systems have possibly contributed in increasing motorization and a changing transportation scenario.

- Adoption of legislative change is too slow. Countries need to increase pace of adoption of legislation relating to key risk factors for road traffic injuries, if the target of the United Nations General Assembly resolution is to be met (i.e. 50% of countries to have comprehensive legislation on key risk factors by 2020, India is signatory to this).
- Strict enforcement of road safety laws is requisite for users' benefit. Currently enforcement of laws relating to key risk factors is considered poor in most countries; sufficient resources are required for enforcement of road safety laws to obtain their full benefit. Social

marketing campaigns can play big role in increasing public understanding of and support for legislative measures.

- More priority towards the needs of pedestrians, cyclists, and motorcyclists is required for reducing road traffic deaths.

These include setting up of guidelines for pedestrians, cyclists, and motorcyclists to make road infrastructure safer for them, intensifying work to improve the proportion of vehicle fleets that meet international crash testing standards, and improving post-crash care.

**Criteria for Assessing and Preventing Road Traffic Injuries**

Haddon's Matrix is an analytical tool that combines the epidemiological triad (host, agent and environmental factors) and levels of prevention set against the time sequence of an incident that helps in identifying all factors associated with crash. [13, 14] It gives insight about planning for injury interventions and prevention strategies (step 3) by phases in time of the event. William Haddon explained multidisciplinary nature of interventions that address at multiple levels, i.e. involves more than one "event," and/or different boxes of the Haddon's matrix are most effective for injury prevention.

Haddon Matrix is used by filling in the 12 empty boxes, where the two elements intersect with a risk factor or potential intervention strategy. Then we can observe that there are multiple points one could intervene in preventing (pre-event) or reducing (event or post) injuries from an injury event (motor vehicle crash, drowning, fall, etc.).

**Components of Haddon Matrix:**

1. Host or Human Factors;
2. Agent or Vehicles (such as crashworthiness of a vehicle) & equipment factor
3. Environment e.g. Physical (such as Roadway design or safety features)
4. Environment e.g. Social (such as passage and enforcement of seat belt laws)

**Combine with time sequence (phases) of an incident**

1. Pre-Event: What factors affect the host before the event occurs?
2. Event: What are factors related to the crash phase?
3. Post-Event: What are factors related to the Post-Event Crash Phase?

	<b>Host or human (Person Affected) factors</b>	<b>Agent or Vehicle factors</b>	<b>Physical environmental factors</b>	<b>Social environmental factors</b>
<b>Pre-crash event (Primary Prevention)</b>	Driving skill: Time pressures (in a rush to get home?): inebriated	Car design & handling: Anti-lock brakes, etc: Maintenance of car	Road design: speed limits	Reliance on private, rather than public transportation raises traffic load: compliance with seatbelt laws
<b>During the crash/event (Secondary Prevention)</b>	Wearing seatbelt?	Air bags working? Size of car & crash resistance	Whether conditions; ice on road?	Quality of emergency assistance; Assistance from bystanders
<b>Post-crash/event (Tertiary Prevention)</b>	Ability to call for help (phone available?); Knows first aid?	Tendency of car to catch on fire	Emergency vehicle access to collision site	Continued funding for emergency services

Case scenario - motor vehicle injury where intervention could decrease the problem

1. Pre-crash Event (before the crash took place)
  - Host.... Driver's experience/ training and information
  - Agent.... Speed of vehicle, roadworthiness, and/or lighting
2. During Crash /Event (during the crash)
  - Host... Seat belt use
  - Agent... Safety rating of vehicle
3. Post-crash Event (after the crash)
  - Host..... General health status of victim
  - Environment... Access to trauma care /rescue facilities, congestion

### Steps in using the Haddon Matrix

**Step 1 :** Use community data to determine injury problem that requires an intervention.

**Step 2 :** Brainstorm potential ideas for interventions and fill them into the cells of Haddon's Matrix.

**Step 3 :** Make decisions about best intervention options based upon effective strategies and practical to implement in your local situation.

### Road Safety

Road safety is a multi-sectoral, multi-dimensional subject and also an issue of national concern. It includes orderly development and management of roads, provision of safer vehicles, legislation and law enforcement, mobility planning, timely provision of health and hospital services, child safety measures, adequate urban land use planning and a comprehensive response to accidents. It depends on improved traffic management systems and practices, adequate safety standards in design, construction, operation and maintenance of roads and production and maintenance of safer vehicles. Owing to unsafe conditions on roads, the rate of accidents in India has been high. Road safety is a shared, multi-sectoral, responsibility of the government and a range of civil society stakeholders. The overall success of road safety strategies globally depends upon a wide support, cooperation and joint action from policy

makers. Thus, its ambit spans engineering aspects of both, roads and vehicles on one hand and the provision of health and medical services for trauma cases (in post-crash scenario) on the other.

### Other measures used

**Abbreviated Injury Scale (AIS)**<sup>[15]</sup> – most commonly used for injury severity classification. Its central focus is to measure threat to life. It lacks focus on loss of functional health status that result from non-fatal injuries.

**Segui-Gomez and MacKenzie**<sup>[16]</sup> – focuses on measuring the long-term health impairments due to non-fatal injuries

**Disability adjusted life years (DALY)**<sup>[17]</sup> - developed as part of GBD project, is a time based measure that combines years of life lost due to premature deaths and years of life lost due to life in less than ideal health states. It allows comparing health burden of injuries with that of other diseases.

### Worldwide Response

WHO response: Commemorating the Decade of Action for Road Safety across the globe.

In 2010, United Nations General Assembly resolution proclaimed a 'Decade of Action for Road Safety' (2011–2020). The decade was initiated in May 2011 in more than 110 countries, with the aim of saving millions of lives by improving the safety of roads and vehicles; enhancing the behaviour of road users; and improving emergency services.

Adopted Sustainable Development's agenda for 2030 has set an ambitious road safety target of reducing the global number of deaths and injuries from road traffic collision to half by 2020.<sup>[7]</sup>

India is one of the signatory amongst ten countries included in the Road safety in 10 countries (RS10) project funded by grant from Bloomberg Philanthropies Global Road Safety programme (2010-2014). National stakeholders implement it with technical support by a consortium of international road safety partners. The partners in India are WHO, the International Injury Research Center from Johns Hopkins University (JHU) and the Global Road Safety Partnership (GRSP). EMBARQ

(The World Resource Center) and the World Bank are also funded through the same grant mechanism to focus on infrastructural issues. The goal of RS10 India is to support the Indian policy makers to implement good practices in road safety in accordance with the national road safety strategy. The focus of the project is to adopt safer practices like helmet wearing, avoiding speeding and drink driving in implementation sites. In addition, the project will provide support to improve trauma care for victims of road traffic injuries.<sup>[18]</sup>

Another initiative by WHO is, organized international consultation meeting in 2002 to develop global curriculum for injury prevention and control. The curriculum, known as TEACH-VIP (Training, Educating and Advancing Collaboration in Health on Violence and Injury Prevention), was launched in 2005 and modified in 2007 as TEACH-VIP2.<sup>[19]</sup>

### Indian Response

Government of India's major concern is growing number of road accidents, injuries and fatalities. Government has taken several initiatives for road safety like raising awareness, campaign about road safety, establishing road safety information database, ensuring safer road infrastructure, ensuring construction of safer vehicles, strengthening system for proper licensing and training of drivers to improve their capability and competence, enactment and enforcement of safety laws, easy access to emergency medical services for road side accidents, promotion of research for road safety, provision of road safety equipment's like interceptors for detection of violation of rules by the road users such as over speeding, drunken driving etc. Government is promoting anti-locking brake system (ABS) for large no of vehicles.<sup>[12]</sup>

### Existing Institutional Set Up for Road Safety in India

Road safety in the country is managed by the Central Government and the State levels supported by efforts of academia and the private sector including industry and Non-Governmental Organizations (NGOs).<sup>[20]</sup>

- Ministry of Shipping, Road Transport and Highways in the GoI (Government of India) is the

administrative ministry responsible for road safety efforts in the country.

- National Road Safety Council (NRSC), it includes the Ministers in-charge of Transport in the State Governments i.e. State Road Safety Council (SRSC).
- The Transport Development Council (TDC) for the formulation of common policies for the development of road transport.
- The Transport Division of the Department of Road Transport and Highways deals with matters relating to safe movement of vehicles on roads and safety awareness among users.
- National Highway Accident relief service scheme (NHARSS) provides cranes and ambulance to states, UT and NGOs for providing relief and rescue measures.

### Other organizations :

The other organizations working in the area of road safety are:

- (i) Indian Roads Congress (for laying down standards and guidelines for road and bridge engineering including road safety).
- (ii) Central Road Research Institute, New Delhi (a Laboratory of the Council of Scientific and Industrial Research (CSIR) that carries out research and development in the field of road, road safety and transportation).
- (iii) Automotive testing and research institutions – Central Institute of Road Transport (CIRT), Pune, Automotive Research Association of India (ARAI), Pune, Vehicle Research and Development Establishment (VRDE), Ahmednagar.
- (iv) Universities and academic institutions like Indian Institute of Technology (IIT), National Institute of Technology (NIT), School of Planning and Architecture (SPA), National Institute of Mental Health and Neuro-Sciences (NIMHANS) etc.
- (v) Other NGOs like Institute of Road Traffic Education (IRTE).

Border Roads Organization is involved in the construction of strategically located roads in border areas.

The National Institute for Training of Highway Engineers (NITHE) was established in 1983 under the Ministry of Shipping, Road Transport and Highways, and it organizes in service training programmes for highway engineers of Central/State Governments, consultants and contractors on all areas relating to roads and road transport, including road safety.

There is a gap of specialists in agencies to tackle the issues of road safety. Research issues are not being identified keeping in view the conditions in India and research is not also being funded adequately. Furthermore, crash investigations are not carried out using modern technology and a scientific approach. The data on road accidents, injuries and mortality is both inadequate and scattered. The data is also not analyzed systematically to provide a basis for policy.

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## Improving Public Institutional Deliveries: Skilled Birth Attendant training to AYUSH doctors in Gujarat

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### Abstract:

**Introduction** : Public institutional deliveries have increased over last one decade. Still there is huge scope to improve it further. AYUSH (Ayurvedic, Unani, Homeopathy and Siddha) doctors are posted in most of PHCs (Primary Health Centers). These AYUSH doctors were trained for Skilled Birth Attendant (SBA) training. Present paper tries to understand impact of training 178 AYUSH for SBA on delivery conductance by AYUSH and its impact on institutional performance for delivery. **Method** : HMIS (Health Management and Information System) provides facility wise monthly details on institutional deliveries. Similarly, PMCC (Performance Monitoring and Control Centre) unit within health department collected information on delivery conducted by AYUSH doctors. In present study, we used data sets from April-June 2013 as baseline data set. Trainings were conducted from October 2013 to March 2014. End line data were collected from April-June 2014. **Results** : The delivery performance of AYUSH doctors improved from 9% before training to 69% after the training. There was a significant difference in the delivery conductance by AYUSH after training ( $M=5.25$ ,  $SD=9.20$ ) and before training ( $(M=0.47$ ,  $SD=2.03)$ ;  $t(177) = 7.09$ ,  $p = 0.000$ .) Similarly, number of PHCs conducting any delivery increased from 27 before training to 127 after training. Functional Delivery Points also increased during this time point from 4 before training to 21 after training. **Conclusion** : Training AYUSH on SBA has been very useful in improving public health institutional deliveries. Further capacity building of AYUSH at other facilities should also be planned in order to further enhance performance. At the same time, efforts should be made to ensure timely recruitment and training of Medical Officers and Staff Nurses in these facilities to augment delivery conductance further in public health institutions.

**Key words** : Skilled Birth Attendants, AYUSH, Institutional Delivery

### Introduction

Gujarat has come long way in improving maternal health. Maternal Mortality Ratio of Gujarat has reduced from 172 maternal deaths per one lakh live births in 2001-03<sup>[1]</sup> to 112 maternal deaths per one lakh live births in 2011-13.<sup>[2]</sup> Total 34% reduction in maternal mortality is observed in last one decade.

This reduction in Maternal Mortality Ratio (MMR) can be attributed to various factors such as increased institutional deliveries; Skilled Birth Attendant (SBA) assisted home deliveries, expanding service coverage in remote parts through government institutions as well as through Chiranjeevi Yojana doctors (Public Private

Partnership).<sup>[3]</sup>

Institutional deliveries have increased from 52% in 2003-04<sup>[4]</sup> to 89% in 2013.<sup>[5]</sup> Furthermore, public institutional deliveries share has also increased from 13% to 35% in same period (HMIS Portal).

### Problem Statement

However, Primary Health Centers (PHCs) of Gujarat are under utilized in delivery service provision. As per the Functional Delivery Point (FDP) criteria of Government of India<sup>[6]</sup> of 10 deliveries per month per PHC, only 118 out of 1300 PHCs (9%) in Gujarat were conducting minimum expected number of deliveries.

Major bottlenecks in lower performance of PHCs were unavailability of MBBS medical officers and staff nurses round the clock. As per the approved manpower of PHCs, it is not possible to provide delivery services round the clock. Hence, many of these facilities were not functioning as per the standards.

To improve this situation Government of Gujarat took a decision to train AYUSH medical officers for conducting deliveries at PHCs. AYUSH (Ayurvedic, Unani, Homeopathy and Siddha) medical officers are placed at PHC level as contractual employee in National Health Mission (NHM). Nearly 800 PHCs have AYUSH medical officers posted full time.

Present paper mainly describes two aspects of mainstreaming of AYUSH. First part describes process involved in starting SBA training to AYUSH. Second part assesses performance of AYUSH doctors and facilities where they were posted, with regards to delivery performance pre and post training.

### **Process of mainstreaming of AYUSH**

The concept of 'mainstreaming of AYUSH' reflected in 9th five year plan for first time.<sup>[7]</sup> Similarly 'National Policy on Indian Systems of Medicine and Homeopathy (ISM & H), 2002'<sup>[8]</sup> also stressed on integrating of ISM & H with allopathic and strengthening ISM & H services in public health system.

A detailed literature review was conducted to understand current situation of AYUSH mainstreaming in India.<sup>[9, 10]</sup> Furthermore, current status of mainstreaming AYUSH in other states such as Maharashtra, Rajasthan and Odisha was also studied.<sup>[11, 12]</sup>

Considering legal perspective and learning from other state it was decided to start training of AYUSH doctors on Skilled Birth Attendant (SBA) training to overcome acute shortage of trained manpower in modern systems of medicine.

### **Need assessment of Training and Curriculum Development**

Training needs assessment was carried out to prioritize training and maximize impact on outcome.

PHC wise mapping of AYUSH doctors was carried out. Prioritization of Female AYUSH doctors and AYUSH from PHCs where MBBS medical officers are not present was done in order to maximize impact.

An expert committee of state directorate, State Institute of Health & Family Welfare, medical college representatives was created to guide on curriculum development for AYUSH training on SBA. Committee suggested using existing training module of SBA<sup>[13]</sup> proposed by Government of India without any amendments. SBA training is very well planned training with enough emphasis on skill development through practical exposure. Other states have used similar curriculum for training of SBA and it was decided that the same can similarly be used for SBA training.

### **Evaluation of SBA training to AYUSH**

Present study describes training of AYUSH conducted between October-2013 to March-14. Analysis was carried out with reference to improvement in performance of trained AYUSH as well as improvement in performance of facilities where these AYUSH doctors are placed. Further comparison was done of these PHCs with rest of the PHCs to observe any significant difference in performance improvement.

### **Method:**

Total 178 AYUSH doctors were trained between October - 2013 to March - 14. Institutional Delivery Performance was measured for all AYUSH doctors trained during this period. Similarly Delivery performance of 174 Primary Health Centers, where these 178 AYUSH were posted, was also carried out.

Present analysis is carried out using two different data sets. Data on training and delivery performance of AYUSH doctors was collected by Performance Monitoring and Control Centre (PMCC). This centre is dedicated monitoring unit created in Health Department to continuously monitor implementation of various program at field level. Second Set of data was collected from HMIS to evaluate performance of respective facilities.

To compensate seasonal variation in delivery conductance, Delivery performance of facility and

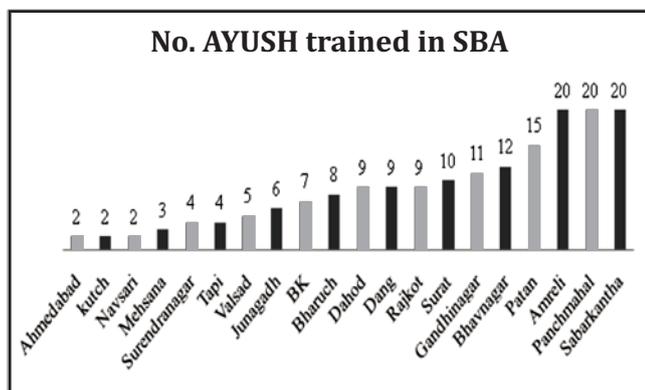
AYUSH during Apr-Jun 13 was considered as baseline. Similarly delivery performance during Apr-Jun 14 was considered as end line data.

**Results :**

Total 178 AYUSH doctors were trained in 6 batches over period of 6 months from October 2013 to March 2014. District wise breakup of training is as follows.

It is important to note that highest number of trainee were from High Priority Districts,<sup>[14]</sup> where shortage of medical staff is further acute. Total 72 out of 178 (40%) trainee AYUSH doctors were from High Priority Districts. (Figure 1)

**Figure 1: District wise SBA training status of AYUSH**



**Delivery performance of AYUSH**

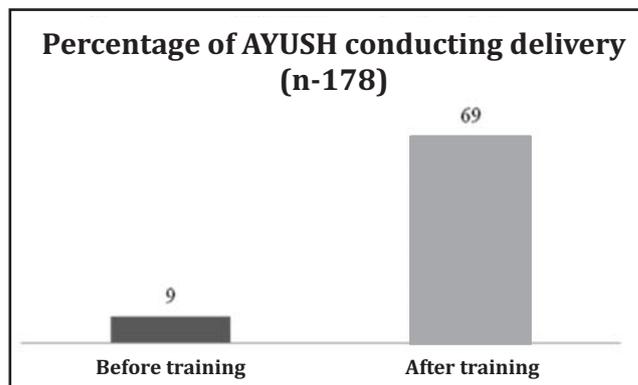
Any improvement in delivery conductance by AYUSH needs to be measured with following 2 indicators. No. of AYUSH doctors started conducting deliveries post training is the first indicator and improvement in delivery performance of respective Primary Health Centre. (Table 1)

**Table 1: Delivery Performance of AYUSH doctors (April-June 13 vs April-June 14)**

SN	Total No. of Deliveries conducted	Apr-June 2013 N (%)	Apr-June 2014 N (%)
1	0	162 (91%)	56 (31%)
2	1 to 4	8 (5%)	67 (38%)
3	5 to 9	6 (3%)	28 (16%)
4	10 or more	2 (1%)	27 (15%)

There is statistical significant improvement in delivery conductance by AYUSH post training.

**Figure 2: Delivery Performance of AYUSH**



There was sharp increase in delivery performance by AYUSH doctors following SBA training. Compared to 9% delivery conductance before training, 69% AYUSH started conducting delivery post training. (Figure 2)

To assess any significant change in conductance of delivery, paired t-test was performed to see improvement post training. (Table 2)

**Table 2 : Change in conductance of delivery**

	Mean	n	Std. Dev.	Std. Error Mean	t	df	Sig
After Training	5.25	178	9.20	0.69	7.09	177	0.000
Before Training	0.47	178	2.03	0.15			

There was a significant difference in the delivery performance by AYUSH after training (M=5.25, SD=9.20) and before training (M=0.47, SD=2.03); t(177)=7.09, p = 0.000.

**Delivery Performance of Primary Health Centre**

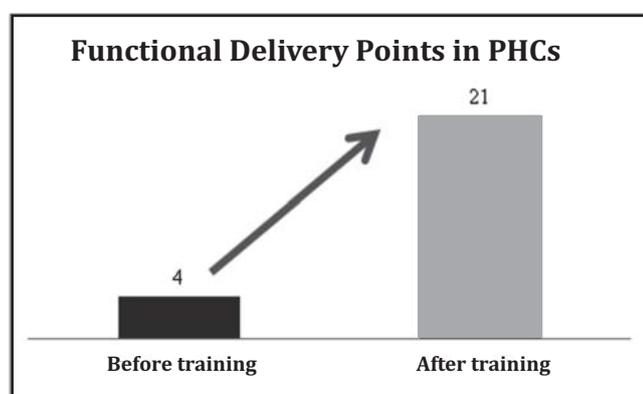
It is equally important to understand impact of training AYUSH doctors on delivery performance of respective Primary Health Centre. Following is performance of facility before training (April-June 13) and after training (April-June 14). 178 trained AYUSH doctors were posted at 174 facilities, so present facility analysis is for 174 facilities. (Table 3)

**Table 3: Delivery Performance of 174 Facilities before and after SBA training to AYUSH**

SN	Total No. of Deliveries conducted	Apr-June 2013 N(%)	Apr-June 2014 N(%)
1	0	147 (84%)	47 (27%)
2	1 to 4	14 (8%)	54 (31%)
3	5 to 9	5 (3%)	25 (14%)
4	10 or more	8 (5%)	48 (28%)

It is to be noted that number of Primary Health Centre conducting zero delivery has reduced from 147 to 47 meaning that 100 facilities started conducting delivery in one year time period.

Another important indicator for the performance of facility is Functional Delivery Point (FDP).<sup>[15]</sup> Any Primary Health Centre conducting 30 deliveries in any quarter (average 10 deliveries per month) can be considered as Functional Delivery Point. Analysis was carried out to understand no. of PHCs, which has improved to become FDP during this one-year period. (Figure 3)

**Figure 3: Improvement in performance of public health institutions**

Paired t test was performed to assess any significant improvement in delivery performance of these PHCs. (Table 4)

**Table 4: Delivery performance of these PHCs**

	Mean	n	Std. Div.	Std. Error Mean	t	df	Sig
After Training	12.78	174	28.58	2.17	5.29	173	0.00
Before Training	2.46	174	12.36	0.937			

There was a significant difference in the delivery performance of facility after training (M=12.78, SD=28.58) and before training (M=2.46, SD=12.36);  $t(173)=5.29, p=0.000$ .

**Discussion :**

Task shifting is worldwide accepted strategy to overcome shortage of qualified trained medical professionals. Government of Gujarat has adopted this strategy in past by means of training MBBS doctors in CEmOC training (Comprehensive Emergency Obstetric Care) to perform C-Section operation and in LSAS training (Life Saving Anesthetic Skills) to provide anesthesia during C-Section operation.

Government of Gujarat adopted SBA training to AYUSH in October-2013. This strategy was further supported by Government of India notification in March-2014 based on ICMR study findings to permit SBA training to AYUSH medical officers.<sup>[16]</sup> Government of India has extended further scope of work of AYUSH doctors in to entire gamut of activities under RMNCH+A including SBA training.<sup>[17]</sup>

Training AYUSH medical officers for conducting deliveries has improved performance of AYUSH doctors as well as of facility where they were posted. Number of AYUSH doctors conducting delivery has increased from 12 to 122 after training. It is further to be noted that 69% AYUSH have started conducting deliveries post training.

Performance of Primary Health Centres has also improved. There were 147 facilities which were not conducting any delivery during April-June 2013. It has reduced to only 47 facilities in April-June 2014 meaning 100 Primary Health Centres started conducting delivery in facility. Similarly, Functional Delivery Points have also increased from 4 to 22.

These findings are very important from Health System Strengthening Perspectives. Gujarat faces shortage of MBBS medical officers at PHCs. Furthermore, presence of one medical officer is not sufficient to provide round the clock delivery services. Staff nurses are not part of PHC staff pattern and can only be availed from NRHM if facility is Functional Delivery Points. It is vicious cycle where

facility if not FDP does not have staff nurses which prevents facility to provide round the clock services reducing possibility of facility becoming FDP.

SBA training to AYUSH can break this vicious cycle. Nearly 900 PHCs have AYUSH medical officers. Furthermore, their retention at Primary Health Centres is also very good considering limited options available. In this situation, SBA training to AYUSH may help in reaching benchmark of 10 deliveries per month and recruiting Staff nurses under NHM to start round the clock services.

### Limitations

Present paper analyses performance AYUSH doctors in conducting delivery along with performance of respective facilities where they are posted. It is to be noted there are multiple of interventions such as recruitment of human resources, infrastructure up gradation, training other staffs, continuous monitoring and Supportive Supervision etc. Hence, it is not possible to attribute improvement solely to the SBA training of AYUSH. Nevertheless, this training remains an important intervention by state government to improve maternal health services in PHCs. Data used in present study for assessing facility performance is from HMIS. HMIS is information provided by facilities and like self-declaration of performance of respective PHCs. However, these reports are continuously monitored at state level to improve accuracy of reporting and make available most authentic information.

### Recommendations

Based on the findings of SBA training to AYUSH doctors in PHCs, following actions are recommended to further improve institutional deliveries in Primary Health Centers.

- SBA training to AYUSH doctors shall be provided to AYUSH doctors from all the facilities, which are planned to be prepared as Delivery Points.
- Quality assurance of training is very important especially in these trainings. SBA trained AYUSH medical officer shall undergo at least one week refresher training every 2 year in order to keep them updated with knowledge.

- Training AYUSH is temporary arrangement for delivery points while better options are made available. Hence state government continues to focus on recruiting adequate qualified human resources at every PHC in order to assure round the clock delivery services at Primary Health Centres.
- Further training AYUSH medical officers on different clinical and managerial protocols can improve service provision as well as monitoring at Primary Health Centres.

### Conclusion :

SBA training to AYUSH medical officers have improved delivery conductance by AYUSH medical officers. Furthermore, it has helped in improving facility performance as well. All remaining AYUSH shall be trained for SBA on fast track basis to improve delivery service provision at Primary Health Centers. At the same time focus should be given to quality assurance as well as refresher training and newer avenues of clinical and managerial training to mainstream already existing large skilled workforce of AYUSH to improve Maternal and Child Health in Gujarat.

### Declarations :

Funding : Nil

Conflict of interest : Nil

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## Assessment of Judicious Use of Immunologicals in Post Exposure Prophylaxis of Animal Bite Cases by Medical Officers in Government Health Centers in an Urban Area of Southern Rajasthan

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### Abstract :

**Introduction** : Rabies is a hundred percent fatal disease with no cure being found till date. Only prompt reporting by the patient and correct prophylactic measures applied by the treating doctor can save a precious life in time. In Rajasthan, under Mukhyamantri Nihshulk Dawa Yojna (MNDY), medicines including anti rabies vaccines and immunoglobulin are dispensed free of cost at all government health centers hence cases of animal bite are first reported to the nearest government health center, the medical officers posted there should be able to give timely and appropriate Post Exposure Prophylaxis ( PEP ). Assessment of Knowledge and practice of the government medical officers regarding management of animal bite cases will help to know whether the resources are utilized properly. **Objectives** : To assess the Knowledge and practice of the medical officers regarding management of animal bite cases in the government health centers in urban Udaipur, identify any gaps there in and recommend rectification measures for the same. **Method** : cross sectional qualitative study was carried out on 44 Medical Officers posted at 17 government urban health centers in Udaipur urban area. A semi structured pre tested questionnaire was the tool. The data was analyzed on SPSS16 version. **Results** : Only 68.2% respondents were aware of all modes of transmission of Rabies. WHO wound categorization was known to 54.6% only. 34.1% and 52.3% respondents, respectively did unnecessary prescription of Anti Rabies Vaccines for category I and Immunoglobulin for Category II wounds. WHO guidelines for wound washing, was followed by 11.4% only. Only 25% respondents were following Essen regimen of vaccination correctly and were injecting the vaccine on deltoid. 75% were following the guidelines on vaccination for delayed reporting. Defaulters were managed correctly by 20.6% only. **Conclusion** : Respondents' knowledge about mode of transmission of Rabies, WHO wound classification and correct protocol of management of the animal bite wounds was less than adequate and it lead to improper wound care and inadequate vaccination and was adversely affecting the utilization of government resources.

**Key words** : Rabies, animal bite, Post Exposure Prophylaxis (PEP), Mukhyamantri Nihshulk Dawa Yojna (MNDY)

### Introduction :

Rabies is a hundred percent fatal disease with no cure being found till date. Death usually occurs within a week after the onset of symptoms and signs of Rabies. According to a latest WHO estimate about 50, 000 human deaths due to rabies are reported every year worldwide, out of which 30,000 are from India alone. <sup>[1]</sup> India also has the higher incidence of animal bite/exposures, which is estimated to be 17.4 million per year. <sup>[2]</sup> On the brighter side, it is one of the

few diseases for which effective pre and post exposure prophylaxis measures are available. Prompt reporting by the patient and correct prophylactic measures applied by the treating doctor can save a precious life in time. In urban areas a common man is aware that animal bite, especially dog bite needs medical attention. Cases of animal bite are first reported to the nearest health centre or dispensary hence the medical officers posted there should be able to give timely and appropriate Post-

exposure prophylaxis, the three main components of which are, wound treatment(1/3),anti-rabies vaccine (1/3),anti-rabies serum+advice (1/3)<sup>[1]</sup>

The Rajasthan government started Mukhyamantri Nihshulk Dawa Yojna (MNDY) from 2nd October 2011, under this, medicines including antirabies vaccines are dispensed free of cost at all government hospitals and health centers and vaccine along with anti-rabies serum at all tertiary care hospitals.

This initiative by the government has minimized the out of pocket expenses of the people but assurance of quality care also depends on the skills of the service providers. With the investment in health by the government and improved awareness of people over the time about gravity of animal bite, it is now time to assess the Knowledge and practice of the doctors posted in government health centers about management of dog bite cases in order to make sure that the resources are utilized properly.

Hence, this study was conducted with the objectives to assess the knowledge and practice of government medical officers regarding management of animal bite cases and to recommend measures if there was need for improvement.:

#### Objectives:

1. To assess the knowledge and practice of medical officers regarding management of animal bite cases in the government health centers in urban Udaipur.
2. To identify any gaps there in and recommend rectification measures for the same in order to ensure judicious use of immunological.

#### Method:

**Study design:** Cross Sectional qualitative study

**Study Area:** All governments run dispensaries, Urban PHCs and Satellite Hospitals in Udaipur city

**Study period:** October 2014.

**Study subjects:** the government doctors (MBBS and post graduates).

There are 15 government dispensaries and 2 Satellite hospitals in Udaipur city, with 51 doctors posted here in. Telephonic appointment was taken from them in advance and they were visited at the end of their OPD hours. 44 doctors gave consent and

participated in the study.

**Study Tool:** A semi structured pre tested questionnaire with 25 questions, 19 of them were in the form of problem based exercises with multiple choice options, to assess the applied aspect of the knowledge.

**Data Analysis:** Data was analyzed using SPSS 16 version. Frequencies along with percentile were tabulated for variables and Chi-square test was applied as the test of significance where applicable.

#### Result:

The results are based on responses received from 44 respondents. It was observed that most of the respondents (79.6%) knew that besides dog, other animal bites can also cause Rabies but causative agent was identified as virus by 30 (68.2%) only. The knowledge regarding wound categorization and mode of transmission of Rabies was found to be low, then correct WHO wound categorization was known to 24 (54.6) respondents and only 15 (34.1%) were aware that besides the bite of rabid animal, there are other modes also of transmission of Rabies [Table 1]

**Table 1: Knowledge of the MOs about Rabies and WHO Animal bite wound categories**

	Knowledge Variable Animals transmitting	Number %
A	<b>Rabies(n=44)</b>	
1	Dogs	9 (20.5)
2	Other animals also	35 (79.6)
3	Don't know	0
B	<b>Causative agent(n=44)</b>	
1	Virus	30 (68.2)
2	Bacteria	9(20.5)
3	Other	5 (11.4)
C	<b>Mode of transmission(n=44)</b>	
1	Bite of rabid animal only	29(65.9)
2	Other modes also	15 (34.1)
D	<b>WHO wound category(n=44)</b>	
1	Correct	24(54.6)
2	Incorrect	20(45.5)

Figures in parenthesis indicate percentage

**Table 2: Knowledge about correct protocol of management of the animal bite wound (n=44)**

	Category I			Category II			Category II		
	A*	B*	C*	A*	B*	C*	A*	B*	C*
	Wound care+ inj.TT** only	A+ inj ARV***	B+ inj ARS*** *	Wound care+ inj.TT** only	A+ inj ARV***	B+ inj ARS*** *	Wound care+ inj.TT** only	A+ inj ARV***	B+ inj ARS*** *
<b>No. (%)</b>	29 (65.9)	15 (34.2)	0	9 (20.5)	12 (27.3)	23 52.3	0	21 (47.7)	22 50

Figures in parenthesis indicate percentage

\*correct protocol, \*\*Tetanus Toxoid, \*\*\*AntiRabiesVaccine, \*\*\*\*AntiRabies Serum

$\chi^2=6.95$ , df= 2, pvalue =0.031 for correct protocol

The correct protocol of management of the animal bite wound in category I and III was known to 65.9 % and 50% respondents respectively but for category II only 27.3% respondents knew the correct protocol.[Table2]

More than half (59.1%) of respondents were in favor of cleaning the animal bite wound with running water. 25% favoured cleaning for 5 minutes only, while 4.6% felt that 2-3 minutes only was sufficient. A mere 11.4% felt that it should be cleaned for 15 minutes. Their attitude towards suturing and bandaging the wound was less than appropriate. Half (50%) of the respondents felt that if suturing of the wound is needed, it should be done as soon as possible before starting ARS instillation while 25% were not in favour of suturing the wound at all. Only 27.3% respondents advocated simultaneous instillation of ARS and suturing of the wound if needed. Only 29.6% respondents were in favour of not bandaging the wound while 47.7% favoured wound bandaging.[Table3]

Anti-Rabies Vaccine was given on correct schedule and right site, only by 25% respondents. Delayed reporting of animal bite cases were managed correctly by 75% while correct management of defaulters and re exposure cases was

**Table 3: Distribution of respondents according to their attitude towards animal bite wound management**

	Wound management	Number %
<b>A</b>	<b>Wound toilet with running water (n=44)</b>	
1	2-3 minutes	2(4.6)
2	Up to 5 minutes	11(25)
3	Up to 10 minutes	26(59.1)
4	Up to 15 minutes	5(11.4)
<b>B</b>	<b>Suturing, if needed (n=44)</b>	
1	ASAP, before starting ARS	22(50)
2	While ARS is instilled	12(27.3)
3	Not at all	11(25)
<b>C</b>	<b>Bandaging (n=44)</b>	
1	Yes	21(47.7)
2	No	13(29.6)
3	Maybe	10 (22.7)

Figures in parenthesis indicate percentage

practiced by 20.6% and 29.6% respondents only respectively. 15.9 % respondents came up with different contraindications for Anti Rabies Vaccination. [Table4]

### Discussions :

India is endemic for Rabies, with stray animals roaming on streets being a common scene; the prevalence of animal bite is high in India. Animal

**Table 4: Correct practice of administering anti rabies vaccine for PEP (as per WHO guidelines)**

	Correct practice	Number
1	Schedule*	11/44(25)
2	Site of administration	11/44(25)
3	Defaulter management	9/44(20.6)
4	Management of delayed reporting	33/44(75)
5	Management of re exposure cases	13/44(29.6)
6	Any Contra indications	7/44(15.9)

Figures in parenthesis indicate percentage

\*Essen Regimen

rabies is also endemic in India with high degree of rabies positivity in laboratory among dogs, cattle, goats, cats, horses & pigs.<sup>[2]</sup>

The Government of Rajasthan under the initiative Mukhyamantri Nishulk Dawa Yojna has been providing free antirabies vaccines to all cases reported to government dispensaries and anti-rabies vaccines along with rabies immunoglobulin to all tertiary care hospitals and district hospitals. Looking at the huge monitory resource dedicated for prevention of Rabies and the fact that Rabies can be prevented only by timely and correct management of animal bite wounds that is, proper wound washing, infiltration of rabies immunoglobulin in and around the wound, and a full course of anti-rabies vaccination, a need was felt for assessment of knowledge, attitude and practice of the MOs working in government dispensaries in order to know whether there sources are utilized correctly and in a justified manner. Out of 44 respondents 19 were females, mean age of respondents was 41 years and mean years of practice was 14.23 years. 29 respondents were MBBS and 15 were holding a postgraduate degree or diploma. All had been managing animal bite cases in the OPD.

The present study showed that the knowledge of MOs regarding mode of transmission of Rabies, WHO wound classification and correct protocol of management of the animal bite wounds was less than

adequate. Though 79.6 % were aware that rabies could be spread by bite of animals other than dogs also, but only 68.2% knew that it could be transmitted by other modes also. Ravish Hardanahalli Shankaraiah et al<sup>[3]</sup> also observed that knowledge regarding animals transmitting rabies was 66.9% only. Our findings are contrary to the results of R.K. Nayak et al<sup>[4]</sup> who observed through their study in Belgaum city that Dog as a source of infection was known to most of the doctors but spread of rabies from other animals was known to only 11% of MBBS and 1% of other doctors only.

There are many dairies in the city, the cattle is allowed to roam on the streets nearby and often they are bit by street dogs, this along with lack of awareness of vaccinating the cattle, increases the possibility of handling of rabid cows and buffaloes by the dairy workers, raw milk consumption is also a common practice in the lower socio-economic status in the city. Only 54.6% respondents had correct knowledge of WHO wound classification. Most of them could label only deep or multiple wounds or wounds on upper part of body, as category III. Ravish Hardanahalli Shankaraiah et al<sup>[3]</sup> conducted a similar study and they observed that only 55.9% of respondents knew about proper risk classification of wounds. Harish et al<sup>[5]</sup> also found through a similar study that 67.2% of the doctors were aware of the WHO classification of animal bite wounds. Contrary to our findings, R K Nayak<sup>[4]</sup>, et al found that Only 6% of the doctors knew the WHO categorization of animal bites and hence the indication to give Rabies Immunoglobulin was known to very few doctors (4-7%).

The respondents had significantly better knowledge about correct protocol of management of the animal bite wounds in category I and III as compared to category II ( p value < 0.05) .34.1% respondents were in favour Anti Rabies Vaccination for category I cases, which are against the guidelines and leads to injudicious use of vaccines. Majority (52.3%) of respondents were not aware that Rabies Immunoglobulin is not prescribed in category II animal bite wounds hence there are unnecessary referrals of category II cases from the urban health

centers to medical college hospital for immunoglobulin. Chowdhury et al [6] have also observed unnecessary RIG recommendation for category II bite cases by 31.2% interns in their study in Kolkata.

The WHO guidelines<sup>[7]</sup> recommend that animal bite wound should be washed with running water for at least 15 minutes. National guidelines<sup>[8]</sup> on the other hand recommend it for 10 minutes. In the present study 59.1 % respondents were following National guidelines of animal bite wound toilet and a mere 11.4% were following WHO guidelines and 25% respondents felt that cleaning the wound for 5 minutes was sufficient. This is similar to the findings of Harish B R, et al<sup>[5]</sup> who observed that only 10.4% doctors advised the animal bite victims to wash the wound for 15 minute. Singh, et al<sup>[9]</sup> on the other hand observed this practice in 47% doctors. The Medical officer's attitude towards care of animal bite wound needs correction. Contrary to the guidelines<sup>[5,6]</sup> 47.7 % were in favour of bandaging and 50% in favour of suturing the wound without ARS instillation. This finding is in contrast with another study by Sudershan M K [10] from Bangalore where only 20% dressed the wound. Bandaging is contraindicated this may facilitate entry of the virus in the blood stream.

The WHO recommended schedule of vaccination (Essen regimen) was followed correctly by 25 % respondents only. All were adhering to the first four doses on Day 0, 3, 7 and 14 but many of them called the patient for fifth dose either on Day 21 or Day 30. Sudarshan M K<sup>[9]</sup> from Bangalore also observed that only 11% of the medical practitioner knew about the correct schedule of Cell Culture Vaccines (CCV) for post exposure prophylaxis. Only 25% knew that it has to be injected on deltoid, the common practice was injecting ARV on Gluteus Maximus, and this made the vaccine ineffective. In another study conducted at Jamnagar, Gujarat by Bhalla, et al<sup>[11]</sup> it was found that 56%

Doctors were administering the vaccine in gluteus region.

Delayed reporting and default after start of treatment is a common practice in patients from urban lower socio economic strata, 75% of the respondents were following the guidelines and prescribing full course of ARV for delayed reporting but only 20.6 % were continuing with the schedule with the defaulters, most of the respondents start fresh schedule of ARV for defaulters, this is a wastage of resources. Due to abundance of street dogs, the prevalence of re exposure to animal bite is high especially in morning walkers and slum dwellers, WHO guidelines recommend only two booster vaccinations with CCV on days 0 and 3 for previously vaccinated re- exposure cases. Only 29.6 % followed the correct management of re exposed patients. Most of the studied respondents were in the practice of prescribing full course of five vaccines to all previously vaccinated re exposed cases. The findings are in line with those of Harish B R, et al<sup>[5]</sup>, who found this figure to be 25.4%. In another study conducted in India Ravish Hardanahalli Shankaraiah, et al<sup>[3]</sup> found that 68.9% of the ARC physicians understood correct management of previously vaccinated and re exposed patients.

PEP should not be denied to any case of animal bite or other contacts of suspected rabid animals, as there is no contraindication for it. In the present study 15.9% respondents though giving prompt wound toilet but were not prescribing inj. ARV to pregnant or lactating women, HIV positive patients, patients with history of allergies or suffering from some acute illness. Such cases were referred to the medical college hospital. Ravish Hardanahalli Shankaraiah, et al<sup>[3]</sup>, have also observed 85.3% doctors with positive attitude towards Anti Rabies vaccination in pregnant and lactating women.

#### **Limitations:**

The sample taken in our study was small and hence generalization would be difficult. The study was limited to Government doctors in urban dispensaries and Satellite hospitals. Only Post Exposure Prophylaxis was focused on. As government, supply of Rabies Immunoglobulin is available only at Medical College Hospital hence

study was limited to practices of wound care and AntiRabies Vaccination only.

### Conclusion :

There is a palpable deficiency in knowledge of the medical officers posted in urban government health centers regarding mode of transmission of Rabies, WHO wound classification and correct protocol of management of the animal bite wounds. This deficiency leads to improper wound care and inadequate vaccinations resulting in increased risk of development of human rabies. The unnecessary prescription of AntiRabies Vaccines for category I wounds and unnecessary referrals of category II wounds for Immunoglobulin is a burden on and wastage of government resources and causes stress and anxiety among the patients.

Overall, there is a need for capacity building of the medical officers posted in urban government health centers in order to ensure judicious use of immunologicals.

### Recommendations :

- Protocols for post exposure prophylaxis should be displayed in all OPDs.
- Regular CMEs should be conducted by the Community Medicine department at the government medical colleges for all government doctors to update them with current knowledge and skills of management of animal bite cases, with special focus on defaulters and delayed reporting.
- There should be a system of audit for the AntiRabies Vaccines consumed at the government health centres to assure judicial and rational use of the vaccines.

### Declarations :

Funding : Nil

Conflict of interest : Nil

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## Facility Based Management of Severe Acute Malnutrition in India : Do we have enough capacity?

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### Abstract:

**Introduction :** Recent India health report on nutrition reveals that India has made some progress in reducing the burden of severe acute malnutrition (SAM) over a period of 8 years from 6.4% to 4.6%. However, 11 out of 29 states still have a high prevalence of >5%. **Objective :** Given the high prevalence of severe wasting in India, it was of interest to undertake situational analysis of India's capacity to treat severe acute malnutrition through facility based management program. **Methods :** Using prevalence of severe wasting, total population of under 5 children and total number of nutrition rehabilitation centers (NRCs) in different states, capacity to treat severely wasted children was estimated. **Results :** NRC capacity analysis revealed that there is huge mismatch between the demand (SAM case load) and the services (NRCs). Total number of NRCs in India is 896, with case load of 1,069 SAM children per NRC. Total number of NRCs in various states ranged from 1 (Jammu & Kashmir, Arunachal Pradesh and Nagaland) to 316 (Madhya Pradesh). Number of children to be treated per NRC was highest in Tamil Nadu (30,042) and lowest in Chhattisgarh (207). Total years required to treat the given load ranged from 1 year (Chhattisgarh and Madhya Pradesh) to 125 years (Tamil Nadu). **Conclusion :** There is an urgent need for planning and setting up additional NRCs with respect to SAM case load.

**Key words :** Nutrition rehabilitation center, Wasting, Children, Capacity

### Introduction :

Recent India health report on nutrition reveals that India has made some progress in reducing the burden of severe acute malnutrition (SAM) over a period of 8 years (6.4%, NFHS 2005-06 to 4.6%-RSOC 2013-14).<sup>[1]</sup> However, 11 out of 29 states still have a high prevalence (>5%). Prevalence of SAM within country ranges from 1.4 (Sikkim) to 7.1 (Arunachal Pradesh).<sup>[1]</sup> Severe morbidity and mortality due to SAM is very well documented, severely wasted children carry a nine times higher risk of dying than normal children and 7.8% of deaths of children are attributed to severe wasting.<sup>[2,3]</sup> Currently, management of SAM in India is largely dependent on facility based centers (Nutrition Rehabilitation centers-NRCs) and various studies have shown that NRCs are effective in reducing the mortality rates.<sup>[4-6]</sup> Given the high prevalence of severe wasting in India, it was of interest to undertake situational analysis of India's capacity to treat SAM through facility based management.

### Method :

Using prevalence of severe wasting, total population of children and total number of NRCs in different states, capacity to treat severely wasted children was estimated.<sup>[1,7,8]</sup> The total load of children per NRC in each state was calculated using total number of NRCs in states and total number of children (with medical complication) needing facility based management (based on recommendations by WHO and UNICEF, which states that only 15% of total SAM children need facility based care, rest 85% can be managed in the community).<sup>[2]</sup> Based on case load, total time required in terms of years to treat these many children in each state was calculated. Assuming that all NRCs have 10 beds and the facility based management for one child is minimum 14 days; hence, in a month 20 children can be treated in one NRC. This comes to treating a maximum of 240 children in a year. Finally, total time (years) required was computed by dividing the total number of children per NRC with 240.

Table 1: NRC capacity to treat complicated SAM children in India

S. No.	State	Severe Wasting (%)	Total Under 5 Children	Total SAM Children	Total SAM Children needing facility based treatment	Total NRCs	Total SAM (MC#) Children Per NRC	Total Time required to treat (years)
0	India	4.6	138861008	6387606	958141	896‡	1069	4
NORTH								
1	Delhi	4.6	1704152	78391	11759	11	1069	4
2	Haryana	2.7	2882509	77828	11674	2	5837	24
3	Himachal Pradesh	3.9	662663	25844	3877	4	969	4
4	Jammu & Kashmir	2.5	1718020	42951	6443	1	6443	27
5	Punjab	3.2	2612299	83594	1253	-	-	
6	Rajasthan	2.9	9008858	261257	39189	40	980	4
7	Uttarakhand	2.6	1142931	29716	4457	2	2229	9
CENTRAL								
8	Chhattisgarh	2.4	3104853	74516	11177	54	207	1
9	Madhya Pradesh	5.4	9142292	493684	74053	316	234	1
10	Uttar Pradesh	2.9	25640761	743582	111537	25	4461	19
EAST								
11	Bihar	3.9	15837132	617648	92647	38	2438	10
12	Jharkhand	3.7	4512458	166961	25044	68	368	2
13	Odisha	4.9	4481140	219576	32936	43	766	3
14	West Bengal	3.9	9012951	351505	52726	31	1701	7
NORTH EAST								
15	Arunachal Pradesh	7.1	177268	12586	1888	1	1888	8
16	Assam	2.7	3937549	106314	15947	16	997	4
17	Manipur*	2.4	315761	7578	1137	-	-	-
18	Meghalaya	5.2	487355	25342	3801	5	760	3.
19	Mizoram*	6.2	145088	8995	1349	-	-	-
20	Nagaland	4.8	242896	11659	1749	1	1749	7
21	Sikkim*	1.4	52896	741	111	-	-	-
22	Tripura*	7	391786	27425	4114	-	-	-
WEST								
23	Goa*	4.9	123331	6043	902	-	-	-
24	Gujarat	6.7	6.7	6645698	445262	66789	127	5262
25	Maharashtra	6.3	11372408	716462	107469	15	7165	30
SOUTH								
26	Andhra Pradesh	6	7725898	463554	69533	30	2318	10
27	Karnataka	6.3	6134041	386445	57967	60	966	4
28	Kerala	5.4	2965778	160152	24023	3	8008	33
29	Tamil Nadu	6.3	6358182	400565	60085	2	30042	125

\*Data analysis for Punjab, Manipur, Mizoram, Sikkim, Tripura and Goa was not done as data on no. of NRCs was not available for these states; #MC-medically complicated; ‡Including 1 NRC in Chandigarh (Union Territory)

## Results :

The capacity for management of complicated SAM cases at individual state level is presented in Table 1. Total number of NRCs in India is 896, with case load of 1,069 SAM children per NRC. Total number of NRCs in various states ranged from 1 (Jammu & Kashmir, Arunachal Pradesh and Nagaland) to 316 (Madhya Pradesh). Number of children to be treated per NRC was highest in Tamil Nadu (30,042) and lowest in Chhattisgarh (207). Total years required to treat the given load ranged from 1 (Chhattisgarh and Madhya Pradesh) to 125 years (Tamil Nadu). Kerala (33), Maharashtra (30), Jammu & Kashmir (27), Haryana (27) and Uttar Pradesh (19) are other states that will require more than 10 years to tackle the present load with present number of facilities.

## Discussion :

NRCs were first launched in Madhya Pradesh under National Rural Health Mission. Following the NRC model of Madhya Pradesh, many other states have also set up similar network of rehabilitative centers for severely wasted children having medical complication. The National Rural Health Mission (NRHM), Ministry of Health and Family Welfare facilitates the states in setting up the NRCs. Facility based capacity analysis revealed that there is huge mismatch between the demand (SAM case load) and the services (NRCs). Total SAM caseload in India is approximately 3 times higher than the capacity (240 children/ NRC/ year). There are total 896 NRCs in India, with 1,069 SAM case load per NRC.

Madhya Pradesh is the only state where despite having a high prevalence of severe wasting, the total time (years) required to treat SAM was found to be less. This is due to the prompt response of the government of Madhya Pradesh in setting up required number of NRCs. This analysis emphasises the need for setting up NRCs based on current population of under 5 children and prevalence rates of severe wasting amongst them. For example, Tamil Nadu has less number of NRCs as per the population of under 5 children and severe wasting prevalence rate amongst them, hence total number of years required to treat SAM children is high.

Various studies on effectiveness of NRC model on child survival rates have shown that NRCs are providing life saving care to SAM children.<sup>[4-6]</sup> Collins and colleagues stated that low capacity to treat SAM

limits treatment and due to low capacity for facility based management of complicated cases, case fatality rates can go up to 20-30%.<sup>[9]</sup> In order to minimize case fatality rates in high priority states (having high SAM prevalence), we need to ensure that we have a balance between the SAM case load and number of centres to treat the given load.

## Conclusion :

We conclude that India has low capacity to treat complicated SAM children. There is an urgent need for planning and setting up additional NRCs with respect to SAM case load in states like- Tamil Nadu, Kerala, Maharashtra, Jammu & Kashmir, Haryana, Uttar Pradesh, Bihar and Andhra Pradesh. Children in these states have a higher risk of mortality as compared to children in other states. This analysis would be helpful for state governments to effectively plan and set up additional NRCs in their respective state in order to minimize the gap between the demand and the services.

## Declarations :

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Conflict of interest : Nil

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## Assessment of Knowledge about Rabies and its Preventive Measures among Attendants of Animal Bite Cases at Anti-Rabies Clinic, Maharana Bhupal Hospital, Udaipur (Rajasthan)

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### Abstract:

**Introduction :** Rabies, also known as hydrophobia is an acute viral disease and the only communicable disease of humans that is always fatal. It is primarily a zoonotic disease of warm-blooded animals, particularly carnivorous and it is transmitted to man usually by rabid animals via bites, scratches or licks.

**Objectives :** Purpose of this study was to evaluate knowledge, attitude and practices of general population on animal bite and rabies. **Method :** Present study was cross-sectional, pre-structured questionnaire based study. Study was conducted among 240 attendants of dog bite cases randomly selected at Anti-Rabies clinic, Maharana Bhupal Hospital, Udaipur. Data was analyzed statistically by simple proportions and test of significance (Chi square test) and Mann Whitney U test were applied using SPSS ver.17 **Results :** Among of 240 respondents, 101 (42%) had adequate knowledge about rabies and its preventive measures Statistically significant difference in knowledge is seen among attendants who got knowledge from literary sources ( $p < 0.05$ ). Majority of individuals (85%) know about the anti rabies vaccine administration. Among the respondents, 92 (38.3%) attendants showed positive attitude regarding anti-rabies vaccination. No significant association was seen between adequate knowledge and positive attitude ( $p > 0.05$ ). Only 4% individuals had already taken anti-rabies vaccination. **Conclusion :** There is lack of overall comprehensive knowledge. There is a gap between knowledge and attitude, which can be increased by IEC activities in print and electronic media and health talks by health personals.

**Keywords :** Rabies, animal bite, knowledge, attitude.

### Introduction :

Rabies, also known as hydrophobia (Fear of water, one of the classical pathognomonic sign of human rabies) is an acute viral disease and only communicable disease of man that is always fatal. It is primarily a zoonotic disease of warm-blooded animals, particularly carnivorous and it is transmitted to man usually by rabid animals via bites, scratches or licks. Once symptoms of the disease develop, rabies is nearly always fatal. Bites by rabid domestic dogs cause 99% of human rabies deaths.<sup>[1]</sup> Roughly, 36% of the world's rabies deaths occur in India each year, most of those when children come into contact with infected dogs.<sup>[2]</sup>

In India, the Andaman & Nicobar and Lakshadweep islands revealed both the areas to be rabies free.<sup>[3]</sup> India has one of the highest numbers of cases of rabies in the world, with estimates of 30,000–50,000 human cases per year. Dogs roam in packs in all areas of the country. Unfortunately, human rabies immune globulin (HRIG) is not readily available in India.<sup>[4]</sup>

In Rajasthan due Mukhyamantri Nishulka Dava Yojana the HRIG is now available at tertiary care centers free of cost to the patients.<sup>[5]</sup> In case of any carnivorous bite, it will be assumed that the individual may have been exposed to rabies. That is because there is no reliable way to test dogs for rabies. Hence, there will be need of post-exposure

treatment. Treatment should begin with immediate, thorough cleansing of all wounds for at least 15 minutes with soap and running tap water. If available, use a virucidal agent such as povidone iodine solutions to irrigate the wounds. Completion of this treatment is must before further evaluation and treatment. All bites by carnivorous animals divided in three categories, in each and every case of category third bite HRIG is administered necessarily within first 72 hours of bite. Each and every category second and third bite case should be treated with post exposure prophylaxis via intra muscular or intra dermal anti rabies vaccination. Intra muscular anti rabies vaccination advised for pre exposure prophylaxis.<sup>[6]</sup>

#### Method :

The present study was across sectional study done at Anti Rabies Clinic of Maharana Bhupal Hospital, Udaipur. Study was conducted following the proper consent of randomly selected 240 attendants of dog bite cases. All the consented individuals were requested to sit properly in a separate room. Information was provided about aims and objectives of the study and methodology adopted while filling the questionnaire. The questionnaire consists of four parts. The first part deals with personal detail, the information regarding rabies, source of information about animal bites and their morbidity. In the second part, we tried to assess the knowledge of participants about Rabies using five multiple choice questions. The questions were:

- (1) According to you how an animal bite managed before visiting hospital?
- (2) Is application of lime or chili or any other substance locally on wound is beneficial
- (3) Is any vaccination necessary after animal bite
- (4) What is rabies?
- (5) Is any method for protection of pet animals is available.

In the third part of the questionnaire we used four questions to test the attitude of the participants rated on Likert scale as (1) Strongly disagree (2) Disagree (3) Agree (4) Strongly agree.

We set the maximum score for each respondent at 16 and minimum at 4. High score ( $\geq 12$ ) indicative of positive attitude and low score ( $< 12$ ) indicative of negative attitude.

In the fourth part of questionnaire participants were asked about if any one of them previously encountered with dog bite or any animal bite and taken anti rabies vaccination. The data was entered and analyzed with the Microsoft office 2007 and SPSS version 17, respectively. Appropriate tables were generated and Chi square test and Mann-Whitney U test used for statistical inferences.

#### Results :

Total two hundred forty attendants of animal bite cases consented and were included in the study. Participants belong to 16-59 years age group (mean age  $38.6 \pm 3.2$  years). A total of 138 (57.5%) attendants correctly know that rabies is preventable by anti-rabies vaccine after animal bite. Responses of the questions meant to assess the knowledge were scored, maximum score was 5 and all those respondents who scored  $\geq 3.5$  were considered to have adequate knowledge. Only 101 (42.1%) attendants showed adequate knowledge. Although 57 (23.7%) attendants got the information about rabies prevention from health personnel's and 8 (3.3%) attendants from audio visual media sources but statistically significant difference in knowledge is seen among respondents who got the knowledge from literary sources and family & friends as compared to other sources ( $p$  value  $< 0.05$ ). (Table1)

Out of all attendants, 98 were from urban area and 142 were from rural area. Among urban attendants 61 (62.2%) showed adequate knowledge whereas among rural areas, 40 (28.2%) showed adequate knowledge. The difference in knowledge among urban and rural attendants was highly statistically significant ( $p$  value  $< 0.05$ ) (Table 2)

Attitude of the all respondent's attendants rated on Likert scale. Only 92 (38.3%) attendants were having favorable positive attitude. Out of them 58 (59.2%) were urban area residing attendants while 34 (23.9%) were attendants who comes from rural background. The Relationship between

**Table 1: NRC capacity to treat complicated SAM children in India**

Source	Respondents	Adequate Knowledge	Inadequate Knowledge	P value
Literature	44 (18.3)	32 (72.7)	12 (27.3)	0.0000
Audio visual media	8(3.3)	5(62.5)	3(37.5)	0.234
Health personnel	57(23.7)	21(36.8)	36(63.2)	0.359
Family and friends	131(54.6)	43(32.8)	88(67.2)	0.001

\*Figures in parenthesis indicate percentage

**Table 2: Comparison of knowledge among different locality of attendants (N=240)**

Residence	Respondents	Adequate Knowledge	Inadequate Knowledge	P value
Urban	98 (100)	61 (62.2)	37 (37.7)	0.0000
Rural	142 (100)	40 (28.2)	102 (71.8)	

\*Figures in parenthesis indicate percentage

**Table 3: Attitude testing of the participants (N=240)**

Attitude testing questions	Strongly Agree	Agree	Disagree	Strongly Disagree
I would take vaccine if I encountered with dog bite	67 (27.9)	139 (57.9)	28 (11.7)	6 (2.5)
Anti-rabies vaccine is safe for preventing rabies	52 (21.7)	126 (52.5)	49 (20.4)	13 (5.4)
I would recommend anti-rabies vaccination to others	78 (32.5)	144 (60)	16 (6.7)	2 (0.8)
I would recommend vaccination of pet dogs to others	73 (30.4)	140 (58.3)	23 (9.6)	4 (1.7)

\*Figures in parenthesis indicate percentage

knowledge and attitude statistically were tested using Mann-Whitney U test and by that knowledge was grouped in two variables adequate and inadequate while attitude as strongly disagree 1 point and strongly agree 4 point, maximum score given was 16. There was no statistically significant association seen between adequate knowledge and favorable positive attitude ( $p > 0.05$ ).

In case of encounter with dog bite in future 206 attendants (85 %) either agreed or strongly agreed to take anti-rabies vaccine. A total of 222 attendants (92 %) agreed they will recommend anti-rabies vaccination to others in case of animal bite encounter. (Table 3)

#### Discussion :

Rabies remains an important public health in India. Our findings highlights the knowledge, attitude

and practices towards animal bite cases and rabies among people attending anti-rabies clinic with animal bite cases at tertiary care hospital Udaipur. In the present, study 42.1% participants showed adequate knowledge in contrast to a study done by Abhishek et al where only 25% respondents show adequate knowledge<sup>[7]</sup> but similar adequacy of knowledge among 47% respondents was seen in a study done by Sudarshan MK et al.<sup>[8]</sup>

A study by Ichhpujani RL found that, 30.9% participants have adequate knowledge about wound washing and preventive measures.<sup>[9]</sup> In Present study, 86% of respondents agreed on taking anti rabies vaccination, if they encounter dog bite in future. Along with that, 88% of respondents showed knowledge of rabies transmission by bite of rabid dog and agreed on recommendation of pet dog

vaccination to others which show similar finding with the KAP study done by Singh US et al at rural communities of Gujarat.<sup>[10]</sup> In present study 38% participants showed favorable positive attitude which is similar to 31% respondents having positive attitude in study done by Sekhon AS et al.<sup>[11]</sup>

### Conclusion :

The present study was done to take a snapshot on people's knowledge, attitude and practice about rabies and its preventive measures. In the present study majority of participants showed knowledge about rabies as a disease and one should seek medical treatment and prophylactic vaccination but overall lack of comprehensive knowledge about prevention, wound washing, pet dog vaccination and disease fatality and there is a gap between knowledge and attitude which can be increased by IEC activities in print and electronic media and health talks by health personals.

### Declarations :

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Conflict of interest : Nil

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## Assessment of Home Based Newborn Care in Slums of Behrampura Area in Ahmedabad City during November,2014

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### Abstract:

**Introduction :** Government of India has started a new strategy called “Home Based Newborn Care” in 2011 to help improving Neonatal Mortality Rate (NMR). This study was conducted to evaluate these services. Objectives: 1. To evaluate Home Based Neonatal Care (HBNC) services at Behrampura & to assess knowledge of mothers about essential new born care at home. **Method :** Cross section study on postnatal mothers who delivered in last 6 months with purposive Sampling technique. **Results :** 69% of Link workers (LW) visited homes on 1st day of delivery, 52.8% LW completed all 6 home visits. 70% mothers had registered pregnancy during 1st trimester. 97.2% of mothers gave exclusive breast feeding. 75% mothers started breast feeding their babies on day 1 of the delivery. 72.2% babies were fed colostrums on the day of delivery. 78% mothers didn't apply anything on the cord stump. 85.6% of mothers were given information about the vaccination by LW. **Conclusion :** The LW could not complete the visits as per guidelines, so there should be strict observation and follow up by MO. The mothers should be educated well about the danger sign to be aware of in the babies and the vaccination.

**Key words :** HBNC, Essential New Born Care at Home

### Introduction :

#### The Global Scenario of NMR

A high Neonatal Mortality Rate (NMR) in developing countries accounts for nearly two-thirds of infant mortality. Annually, four million neonatal deaths, and about the same number of stillbirths, occur globally, 98% of them occur in developing countries.<sup>[1, 2]</sup> Globally, over 130 million babies are born every year, and almost 4 million die in the first four weeks of life.<sup>[3]</sup> Even though the primary causes of neonatal deaths are estimated to be preterm birth (28 percent), severe infections (26 percent), birth asphyxia and injuries (23 percent), tetanus (seven percent), congenital anomalies (seven percent) and diarrhea (three percent), with Low Birth Weight contributing to large proportion of neonatal deaths.<sup>[4]</sup> Studies show evidence about contribution of care practices immediately following delivery to newborn's risk of morbidity and mortality. [9] Studies report that most new-borns in low income countries like India die at home while they are cared by mothers, relatives, and traditional birth attendants.<sup>[5]</sup>

### India

Infant Mortality Rate (IMR) has declined from 146 in 1951 to 42 in 2012.<sup>[5]</sup> Presently, the infant mortality rate (IMR) for India is 38 per 1000 live births, and the neonatal mortality rate (NMR) is 28 per 1000 live births.<sup>[6]</sup> Each year, out of the 26.5 million infants born in the country, about 0.78 million die before they complete one month of life and a total of million die before their first birthday.

Infections, prematurity, and birth asphyxia, are the major causes of death in the neonatal period. As per the recent World Health Organization: Child Health Epidemiology Reference Group report, the estimated under five deaths are nearly two million per year. It also shows that neonatal deaths constitute 52% of under 5 mortalities in India. The main causes of death in order of frequency are preterm complications and intra-partum related events such as birth asphyxia.

In cases of institutional delivery, where the baby and mother are discharged after 48 hours according to current guidelines, it is expected that

care for the new born during this period is provided at the institution. A significant proportion of mothers prefer to return home within a few hours after delivery, so there is need of home based new born care to be available even for such babies born in institutions to tide them over the first day and thereafter. Although this is not desirable and all efforts should be made to convince the mothers to stay in the institutions for the first 48 hours, existing evidence shows that while at an all India level nearly 45% of mothers return home before 48 hours. However, this percentage is very low in states of Bihar (15.3%), Haryana (29.2%), Nagaland (21.1%) and Orissa (28.3%) as per Coverage Evaluation Survey-2009 by UNICEF.<sup>[7]</sup>

Government of India has started a new strategy called Home Based Newborn Care in 2011 to help improving NMR. This study was conducted to evaluate these services. Community-based trials from Maharashtra and Uttar Pradesh in India showed 62% and 54% reductions in neonatal mortality, respectively, through multiple prenatal and postnatal home visits by trained community level health workers.<sup>[8, 9]</sup> Studies on newborn care in some communities show that the knowledge and practice of basic newborn care for instance prevention of hypothermia, feeding of colostrums and exclusive breast-feeding are lacking; even awareness regarding care seeking on the identification of life threatening signs has been found to be very low.<sup>[10]</sup>

Home based newborn care service program has been there since 2011, the main objective of it is new born care continuum. ASHA gets incentives for this.

#### Objectives:

1. To assess home based neonatal care services in Behrampura area during November,2014.
2. To assess the knowledge of mothers about essential new born care at home.

#### Method :

This is a cross sectional type of study, in which evaluation of provision of Home Based Newborn Care was done in slum population of Behrampura area, at Ahmedabad city. Out of 65 wards in Ahmedabad city

area, Behrampura ward was selected as per convenience. The questionnaire was formed and 180 post-natal women were interviewed house to house. Sampling technique used to select mothers is convenient type of sampling, (mothers who were available at home at the time of visit and who were willing to take part in the study were included). Inclusion criteria of the study was mothers who delivered baby in last 6 months to ignore the recall bias and exclusion criteria was mothers who did not want to be the part of the study.

Permission of Family Welfare Officer, Ahmedabad city, and the Medical Officer of the Urban Health Centre -Behrampura was taken. Informed verbal consents of the women were taken at the time of the interview and confidentiality was maintained. Ethical clearance was also ensured from Institutional Ethics Committee.

#### Results :

**Table 1: Distribution of Socio-demographic profile of mothers**

Variable	Frequency	Percentage
<b>Type of family</b>		
Nuclear	180	100
Joint	0	0
<b>Education</b>		
Primary	137	76
Secondary and higher secondary	35	20
Graduation	1	0.5
Illiterate	7	3.5
<b>Religion</b>		
Hindu	121	68
Muslim	59	32
<b>Below Poverty Line (BPL) Status</b>		
Yes	160	89
No	20	11

Table shows the socio demographic profile of the mothers who were included in the study.

Out of 180 mothers, neonates delivered with help of traditional birth attendant (TBA) were 3%. The 56.14 % mothers had 2-4 years of spacing between two children, followed by 42.1% who had birth spacing below 2 years, which is followed by 1.7% who had birth spacing of more than 4 years. Mean age of the mother is  $23.34 \pm 2.681$ , where 70% of mothers were of age between 20-25 years. Mean number of children is  $1.94 \pm 0.96$  years, where 37.5% had one child, 42.2% had 2 children and 20.1 mothers had > 3 children. 74.2 of the neonates had birth weight between 2.5 to 3.5 kg, followed by 25.2% neonates who had birth weight of <2.5kg and 0.6% neonates who had birth weight of >3.5kg. Mean birth weight of neonates is  $2 \pm 1.2$ kg. 79.3% of neonates had birth order 1 to 2, followed by 19.5% neonates who had 2-4 birth order and 1.2 % neonates had birth order >4. Mean birth order is  $1.89 \pm 0.92$

Mothers had registered pregnancy during first trimester were 70%. 75.6% mothers had <4 ANC visits done and 24.6 % women had >4 ANC visits done, Mean ANC visits done  $3.64 \pm 1.31$ , mothers who had institutional delivery were 96.7% and all deliveries were full term. Among all babies 53.3% were males. Mothers of 21% neonates had applied kajal around neonate's eyes. Only 5% of mothers had knowledge about dangers signs. Mothers with information about the vaccination given by Link Workers (LW) were 85.5%. Neonates who were visited at home on 1st day of delivery were 68.9%..

Exclusively breastfed Neonates were 97.2%. Mothers of 75% had started breast-feeding on day 1 of the delivery. Neonates who were given colostrum on the day of delivery were 72.2%. Neonates who were given delayed bath after birth were 71.9%. All the babies were wrapped in multilayer cloth after birth. (Table 2)

**Table 2 : Distribution of mothers according to newborn care practices**

Variable	Yes	No
Exclusive breast feeding	95%	5%
Colostrum	72.2%	27.8%
Bath (delayed)	73.8%	26.2%
Multilayer wrap	100%	-

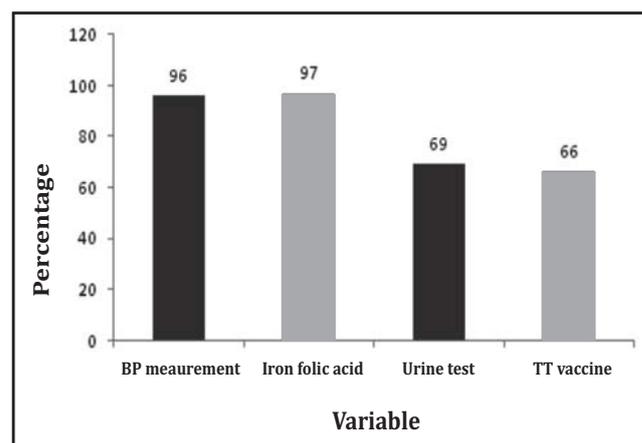
Mothers of 78% neonates did not apply anything on the cord stump and remaining 28% applied several things that is shown in the graph. Mothers of 62.8% neonates were practicing hand washing with soap and water every time before handling the baby

**Table 3 : Distribution of mothers according to Essential newborn care knowledge**

Parameter	Frequency	Percentage
Vaccine education	154	85.6
Application of kajal around eyes	38	21.1
Hand washing	113	62.8
Danger signs knowledge	8	4.4

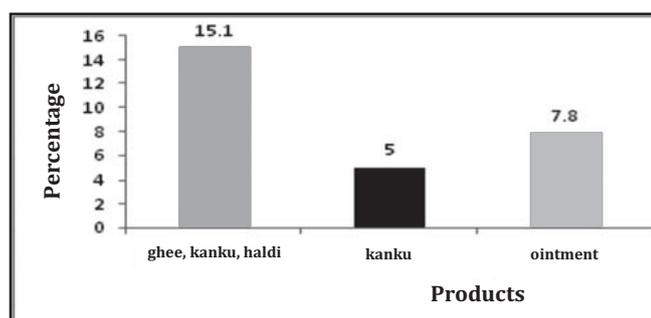
21.1 % mothers applied kajal around eyes of neonates, 62.8% were performing hand washing before carrying the baby, 4.4 % had knowledge about danger signs to be aware of in the neonates.

**Figure 1 : Distribution of Antenatal profiles in mothers (n=180)**



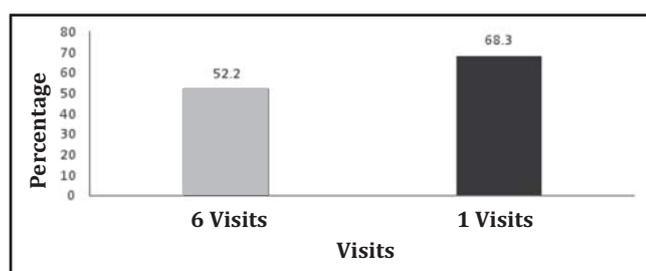
96% mothers had BP measured everytime they visited the ANC clinic, 97% mothers had taken iron folic acid regularly during pregnancy, 69% had urine test day on ANC visit and 66% women had taken tetanus toxoid taken during pregnancy.

**Figure 2: Distribution of various products applied on cord stump (n=40)**



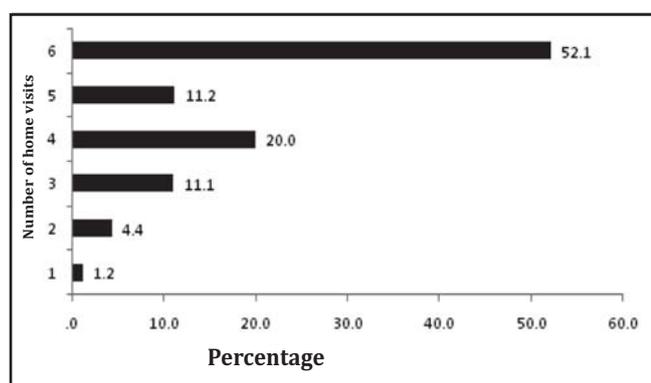
78% mothers did not apply anything on the cord stump and remaining 22% applied several things that is shown in the graph.

**Figure 3 : Distribution of home visits done by link workers(LW) (n=180)**



52.2 % link workers had done all 6 home visits and 68.3% had visited the neonate on the 1st day of delivery

**Figure 4 : Distribution of mothers according to home visits done by LW (n=180)**



52.1% link workers(lw) had 6 complete home visits,11.2 % had 5 visits done,20% had 4 visits done,11.1% had 3 home visits ,4.4% had done 2 home visits and 1.2 % LW had done 1 home visit.

**Discussion :**

Home based newborn care services have been in place since 2011. Majority of mothers know about vaccine and about birth registration. According to our study, in half of the neonates, six mandatory home visits were done by the link workers. 4.4 % mothers had knowledge about danger signs to look for in neonates. We could find out that most of the mothers had adapted to SAFE practices, except in the area of cord stump application with various products as mentioned in results section. 78% mothers did not apply anything on the cord stump and remaining 22% applied several things. Some other studies also show low coverage of clean cord care practices among home deliveries in South Asia.<sup>[11]</sup> 97.2% of mothers were giving exclusive breast feeding to their neonates. 75% mothers had started breast feeding their neonates on day 1 of the delivery. 72.2% neonates were fed colostrum on the day of delivery. Recent studies from Nepal, Pakistan and Bangladesh also which shows early breast-feeding initiation rates of 91 percent, 73 percent and more than 90 percent respectively.<sup>[12- 14]</sup> Over 85% of the mothers were given the education about vaccination.<sup>[9]</sup> 21 % of mothers applied kajal around their babies' eyes, 62.8% were practicing hand washing before carrying neonates, 4.4 % had knowledge of danger signs. Studies on newborn care in some communities show that the knowledge and practice of basic newborn care for instance prevention of hypothermia, feeding of colostrum and exclusive breast-feeding are lacking; even awareness regarding care seeking on the identification of life threatening signs has been found to be very low.<sup>[10]</sup> Most of the mothers had less than 4 ANC visit, certain other studies have also shown that less ANC visits are associated with more mortality, which can also be associated with less effective job by the LW. A randomized controlled trial in Pakistan showed that training TBAs and their integration into the health system to propagate newer safe practices, such as cord care, were effective in reducing neonatal mortality by 30%.<sup>[15]</sup> Low birth weight prevalence in India is 20% while in

our study it was 25%.<sup>[16]</sup> In the last decade, as per the National data, health indicators including utilization of antenatal care services were as poor as 60% in rural India.<sup>[1]</sup> While in our study, the utilization of ANC care is about 96%. Therefore, based on present study it is recommended that there should be refresher training for the LW at regular intervals. The mothers should be educated well about the danger signs to be aware of in the neonates and also the vaccination. There should be follow-up of all the post-natal mothers by the LW according to the days given in the guidelines.

**Declarations :**

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Conflict of interest : Nil

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## Comparison of Health Promoting Lifestyle of Undergraduate Students from Two Diverse Cultures of India

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### Abstract :

**Introduction** : Non-Communicable Diseases (NCDs) are a major public health challenge worldwide, which accounts for nearly two-third deaths, with majority occurring in low- and middle-income countries. The unhealthy behaviours in early part of life are major contributors of NCDs. No attempt has been done to document health promoting lifestyle behaviours of university students in different geographical and socio-cultural settings. **Objective** : To compare the health promoting lifestyle of North Indian and North Eastern undergraduate students in Chandigarh. **Method** : This descriptive analytical study was done in year 2011 among undergraduate Northern and North Eastern students enrolled in different colleges of Chandigarh. A 50 item Health Promoting Lifestyle Profile (HPLP II) tool modified according to Indian standards was used to measure the health promoting behaviour. The anthropometric measurements of students were also assessed. **Results** : The Northern students had higher HPLP score as compared to North Easterns, (135.83 ± 13.8 vs 134.29 ± 12.5). The mean HPLP score of North Easterns was significantly associated with gender (p=0.03) and stream (p=0.006). Body Mass Index (BMI) measurements showed that more North Easterns (27.9%) were in overweight or obese as compared to Northern students (17%). Waist Hip Ratio (WHR) measurements showed that more Northern (56.9%) than North Eastern (48.6%) were under higher risk category, which however was not significantly different. **Conclusion** : The overall HPLP score is not significantly different between Northern and North Easterns. Further the anthropometric measurements of both groups showed that they were at high risk of NCDs. This demands integration of primary prevention in their educational curriculum, which should be supported by regular health promoting lifestyle interventions.

**Key words** : HPLP, Lifestyle, Health promotion, Body Mass Index, Adolescents

### Introduction :

Non-Communicable Diseases (NCDs) are a major public health challenge worldwide which accounts for almost 63% deaths, with nearly 80% in low- and middle-income countries. <sup>[1]</sup> Further, the mortality due to NCDs is projected to increase by 15% globally between 2010 and 2020. <sup>[1]</sup> World Health Organization (WHO) estimates that 60% of all deaths due to NCDs occur in India. <sup>[2]</sup> In 2010, NCDs accounted for more disability-adjusted life years (DALYs) in India than communicable diseases. <sup>[3]</sup> The impact of NCDs is devastating in terms of premature morbidity, mortality, and economic loss. <sup>[4]</sup> The main contributing factor for increase in chronic diseases is change in lifestyle towards the unhealthy continuum

and unhealthy behavior like tobacco use, excessive alcohol consumption, unhealthy dietary habits and physical inactivity leading to overweight, raised blood pressure and cholesterol.

The majority of the unhealthy behaviours that underlie NCDs start during adolescence. <sup>[5]</sup> Global trend indicates that these NCDs related behaviours are on the rise among young people and the patterns of behaviour persist throughout life and are often hard to change. <sup>[6-8]</sup> The effects of risk factors of various NCDs are avoidable if unhealthy behaviours are identified and modified at an early stage by adopting healthy lifestyle. <sup>[9,10]</sup> Many studies have demonstrated a negative relationship between health-promoting lifestyle and occurrence of NCDs,

while a positive relationship was observed with quality of life.<sup>[11-13]</sup> Hence, health promotion, which focuses on the pre-pathogenesis phase of disease, is the best strategy for prevention of NCDs.

The Northern part of India has become host to increasing number of migrant students from other parts of India especially North East India<sup>[14]</sup> due to increased opportunities in terms of higher studies,<sup>[15]</sup> prospects of better employment and decreased socio-political unrest as compared to North- East region.<sup>[16]</sup> These students differ from northern students in terms of eating habits, customs and traditions, costumes, faith and social systems, personal traits and lifestyle, all of which makes them difficult to adjust in changed situations of North India. They are exposed to various stressors in new environment leading to changed health behaviour, which may in-turn affect their health.<sup>[17]</sup>

#### **Objective :**

To compare the health promoting lifestyle of North Indian and North Eastern undergraduate students in Chandigarh.

#### **Method :**

Study Area: The study was carried out in Union Territory (U.T) Chandigarh, which is located in Northern part of India. It has a population of around 1.1 million, 90% of whom reside in urban areas. It has excellent health and socio-demographic indicators as compared to most of the states of India. The city has an overall high literacy rate of 86 percent.

#### **Study type and Sampling :**

The present cross sectional comparative study was done in year 2011 among undergraduate Northern and North Easterns Indian students enrolled in various colleges of Chandigarh. A list of colleges with primary enrolment of North Easterns was prepared, out of which, five colleges were purposively selected using lottery chits. All students who belonged to North East in selected classes of five colleges were enrolled in the study. An equal number of Northern students were randomly selected from the same college in which North Easterns were enrolled. In this fashion, a total of 250 students (125- North Easterns and 125- Northern) were enrolled for the study. However, 16 students

(14- North Easterns and 2-Northern) did not complete the study tool and hence were not included in the analysis.

#### **Study Tool :**

A validated and standardized tool for use among adults and adolescents 'Health Promoting Lifestyle Profile (HPLP) II' was used for the study.<sup>[18-20]</sup> The instrument provides a multidimensional assessment of health promoting behaviour and psychosocial well-being of individuals.<sup>[18]</sup> The HPLP II scale was adapted to Indian settings with two items deleted from the original HPLP- one from 'physical activities' subscale "Check my pulse rate when exercising" and other one from 'nutrition habits' subscale, "Eat only two to three servings from the meat, poultry, fish, dried beans, eggs each day".<sup>[21]</sup> The adapted HPLP tool has six sub-scales with 50-items. The six subscales contain items related to health responsibility (n=9 items), nutrition (n=8 items), physical activity (n=7 items), stress management (n=8 items), spiritual growth (n=9 items) and interpersonal relations (n=9 items). All items were scored on a 4-point Likert scale from 1 to 4; 1 = never, 2 = sometimes, 3 = often, 4 = routinely. Higher mean HPLP score represented a higher level of health-promoting behavior.

#### **Data Collection :**

After obtaining informed consent from Principals of respective colleges, the students were asked to gather in one class room at predetermined time. The tool was administered to them and their anthropometric measurements (height, weight, waist circumference, hip circumference) were done using standardized equipments and procedures. Body Mass Index (BMI) and Waist-Hip Ratio (WHR) was calculated and classified according to WHO guidelines.<sup>[22]</sup> Students doing graduation through correspondence or during the evening hours were excluded from the study.

#### **Data Analysis :**

The data were analyzed using IBM Statistical Product and Service Solutions -version 16 (SPSS-16) for windows. Descriptive statistics was used to calculate HPLP score of study population, while t-test for independent samples was used to compare the mean HPLP scores in two groups of students.

**Ethical Permissions :**

The study was approved by Institute Ethical Committee, Post Graduate Institute of Medical Education and Research (PGIMER), Chandigarh. The prior written consent was obtained from Vice Chancellor, Panjab University, Chandigarh; principals and selected students of respective colleges.

**Results :**

All 250 students participated in the study making a response rate of 100%. However, the data of 234 students was analyzed as rest did not respond to few questions in the questionnaire. The socio-demographic variables of students are provided in Table-1.

**Table 1 : Socio Demographic profile of the study participants**

Study variables	Northern students (N=123)	North Eastern Students (N=111)
<b>Age (years)</b>		
17-19	109(88.61)	87(78.37)
20-22	14(11.38)	24(21.62)
<b>Gender</b>		
Male	58(47.15)	57(51.35)
Female	65(52.84)	54(48.64)
<b>Religion</b>		
Hindu	84(68.29)	107(96.4)
Muslim	6(4.878)	1(0.9)
Sikhs	32(26.01)	0
Christian	1(0.813)	3(2.7)
<b>Gross Income (INR) *</b>		
<10000	34(27.64)	19(17.11)
10000-25000	32(26.01)	29(26.12)
25000-50000	29(23.57)	37(33.33)
50000-75000	10(8.13)	11(9.90)
>75000	11(8.94)	12(10.81)
<b>Stream*</b>		
Arts	56(45.52)	88(79.27)
Science	9(7.31)	21(18.91)
Commerce	58(47.15)	1(0.90)
<b>Accommodation*</b>		
House (rented/own)	87 (70.73)	43 (38.73)
Hostel	29 (23.57)	55 (49.54)
Paying Guest	5 (4.06)	12 (10.81)

\*Column total do not correspond to total number of respondents due to non responders

Majority of students, Northern (88.6%) and North Eastern (78.4%), were in the age group of 17-19 years. Majority of North Eastern (79.3%) belonged to arts stream whereas more Northern students belonged to science and commerce stream. BMI measurements showed that more North Eastern (27.9%) were in overweight or obese category as compared to Northern students (17%). WHR measurements showed that more Northern (56.9%) than North Easterns (48.6%) were under higher risk category, which however was not significantly different. (Table 2)

**Table 2: Comparison of anthropometric measurements of Northern and North Eastern Students**

Anthropometric Measurement	Northern Students (N=123) n(%)	North Eastern Students (N=111) n(%)	Chi square value	P value
<b>Body Mass Index</b>				
Underweight (<18.5)	35 (28.5)	23(20.7)	4.61	0.09
Normal (18.5 - 22.9)	67(54.5)	57(51.4)		
Overweight (23.0-24.9)	11(8.9)	15(13.5)		
Obese (>25)	10(8.1)	16(14.4)		
<b>Waist Hip Ratio</b>				
Low Health Risk	53(43.1)	57(51.)	3.59	0.16
Medium Health Risk	16(13)	8(7.2)		
High Health Risk	54(43.9)	46(41.4)		

Table-3 shows the comparison of HPLP score between Northern and North Eastern. The Northern students had significantly higher mean HPLP score as compared to North Eastern (135.83 ± 13.8 vs 134.29 ± 12.5, p=0.04). There was no significant difference in various mean sub-scales scores between two groups of students except for mean Interpersonal relations score which was significantly higher in Northern students (26.09 ± 13.8 vs 25.07 ± 12.5).

**Table 3: Comparison of HPLP Subscale Score between Northern and North Eastern Students**

HPLP Sub-scales (Maximum Permissible Score)	Northern students (N=123)	North Eastern students (N=111)	Mean difference	t- test	p value
	Mean Score				
Health responsibility (32)	25.13	24.40	0.73	1.24	0.06
Physical activity (28)	16.13	16.80	-0.67	-0.87	0.65
Nutritional habit (32)	21.10	20.84	0.26	0.79	0.46
Stress management (32)	20.01	20.18	-0.17	-0.02	0.19
Interpersonal relation (36)	26.09	25.07	1.02	2.34	0.01*
Spiritual growth (36)	27.37	27.70	-0.33	-0.58	0.78
Total score (200)	135.83	134.29	1.54	82.9	0.04*

\* p- value significant at 0.05 level

**Table 4 : Association between socio-demographic variables and mean HPLP score between Northern and North Eastern Students**

Study variables	Northern Students (N=123)			North Eastern Students (N=111)		
	Mean HPLP(SD)	F	p-value	Mean HPLP(SD)	F	p-value
<b>Gender</b>						
Male	135.0 (13.6)	0.37	0.54	135.0 (13.6)	0.37	0.54
Female	136.5(13.9)			136.5(13.9)		
<b>Age (years)</b>						
17-20	136.1(14.0)	0.42	0.51	133.8(12.75)	0.59	0.44
21-22	133.5 (11.6)			136.6(12.08)		
<b>Gross Income (INR)</b>						
<25,000	132.6 (12.4)			135.1(10.2)	0.17	0.68
>25,000	139.2(15.2)	6.5	0.01*	134.1(14.0)		
<b>Stream</b>						
Arts	135.8(13.8)			132.7(12.5)	5.31	0.006**
Science	137.0(11.5)	0.036	0.96	141.7(10.3)		
Commerce	135.6(14.2)			120(12.6)		
<b>BMI</b>						
Underweight (<18.5)	135.4(13.6)	2.9	0.03*	130.2(10.0)	2.1	0.1
Normal (18.5 - 22.9)	134.3(13.1)			136.2(11.7)		
Overweight (23.0-24.9)	147.1(12.9)			133.4(18.2)		
Obese (>25)	135.0(15.7)			124.0(4.3)		

\* p- value significant at 0.05 level    \*\*p- value significant at 0.05 level

The mean HPLP score of North Eastern was significantly associated with gender (p=0.03) and stream (p=0.006) whereas among Northern students, it was significantly associated with income (p=0.01) and BMI (p=0.03) of respondents (Table-4).

## Discussion :

The students in a university are in a dynamic transition period between adolescence and adulthood, where they undergo a major physical, psychological, social development, and gradually assume responsibility for their own health. Most students acquire healthy or unhealthy lifestyle behaviours during this period.<sup>[23]</sup> The migration of students in this stage of their life further affects behaviour and lifestyle, as they try to adapt to their new surroundings in order to make new friends and society.<sup>[24]</sup> It has been established that promoting healthy lifestyle choices and preventing risky behaviour during this stage will go a long way to yield positive health outcomes in the future. Therefore, it is essential to understand their health-promoting behaviours in order to design suitable interventions.<sup>[25]</sup> The anthropometric measurements of both group of students showed that they were at high risk of NCDs. The finding is consistent with other studies.<sup>[26]</sup> This may be due to unhealthy dietary habits like frequent intake of junk foods and sweets with fewer intakes of fruits and green leafy vegetables, as was also found in our study. The present study also found that the study groups were less engaged in physical activity, which further adds to the NCDs risk. Similar findings were reported in other studies.<sup>[21, 27]</sup> Poor sporting facilities, heavy load of studies and engagements in smartphones/computers could also be reasons of physical inactivity.<sup>[28,29]</sup>

According to BMI, more number of North Easterns (27.9%) were in overweight or obese category as compared to Northern students (17%). In contrast, Waist Hip Ratio (WHR) measurements showed that more Northern than North Eastern were under higher health risk group. Few studies support the findings of present study.<sup>[30, 31]</sup> The probable reason for this difference could be due to the fact that these two measures describe body habitus in different ways. BMI accounts for both lean muscle mass and total body fat whereas WHR represents predominantly truncal obesity. BMI does not distinguish between weight associated with muscle and weight associated with fat. As a result,

the relationship between BMI and body fat content varies according to body build and proportion and therefore does not account for the wide variation in the nature of obesity between different individuals and populations.<sup>[22]</sup>

The mean HPLP score of both groups of students was similar to university students in other studies, ranging from 118.4 in Turkey,<sup>[32]</sup> 119.8 in Hong Kong<sup>[33]</sup> and 138.69 in North India.<sup>[21]</sup> It suggested that students in the same age groups display similar health behaviors globally. The male students and those studying in science stream had significantly better HPLP score than their counterparts. The reasons could be attributed to more involvement in physical activity amongst males than females and more knowledge about body and health to students studying science than those studying other subjects.<sup>[31, 29, 34]</sup> We also observed that there was a significant difference in mean HPLP score of Northern (135.8) and North Eastern (134.3) students. The study could not associate the effect of different variables on HPLP score; however, this may be due to differences in socio-cultural-geographical and behavioral characteristics of two groups of students. Further, the migration of North Eastern from their native place may have adversely affected the HPLP score.

Though in-significant, it was observed that Northern students had slightly better nutrition and health responsibility score as compared to their counterparts. Higher intake of fast foods and cold drinks and skipping of meals was reported in North Eastern. The reason could be that as around two third of North Eastern stay either in hostels or as Paying Guests, due to which they usually opt for junk food options which are readily available. Further frequent skipping of breakfast among hostlers has also been associated with lower nutritional status and the risk of cardiovascular diseases.<sup>[35]</sup> Other studies had also reported that irregular breakfast habits may contribute to development of obesity.<sup>[36]</sup>

The study provides clear evidence that there is a need for regular health education programs on health promoting lifestyle. The health promoting lifestyle education programs should be inbuilt in their

educational curriculum along with provision of facilities for physical activity (gym, sports complex etc). The interventions that support cultural strengths will be more successful than those that fail to take such a broad perspective.<sup>[37]</sup> The health behaviour change models like Trans theoretical model, Health Belief model, BASNEF model can be applied to record their behaviours and identify the factors that will bring change in belief and decision making. The study offers insights that might be useful in guiding the development of comprehensive interventions for university students to promote healthy lifestyle behaviours.

The study had few limitations. The information collected was based on a self-reported questionnaire, therefore, possibility of getting socially desirable responses may not be ruled out. However, anonymity of the questionnaire might have prevented creeping of socially desirable responses. Further, the results of study may not be generalized to individuals of different educational levels and age. The strengths of study were enrollment of representative group of students in both categories thus making it representative for students of similar settings, using a validated scale for measuring HPLP score and adhering to Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) guidelines for cross-sectional study.

### Conclusion :

The HPLP score is significantly different between Northern and North Eastern Students. Further, the anthropometric measurements of both group of students showed that were at high risk of NCDs. This demands integration of primary prevention in their educational curriculum, which should be supported by regular health promoting lifestyle interventions. Qualitative studies are needed to provide insight into student' health promotion needs and interests.

### Declarations :

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**Conflict of interest :** Nil

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## Prevalence of Reproductive Tract Infection (RTI) Amongst Reproductive Age Women in Rural Area: A Missed Opportunity

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### Abstract:

**Introduction :** Reproductive Tract Infection (RTI) among women often go undiagnosed and have remained as an unmet need. Such problems never get treated unless it is asked as a leading question by the health workers. An untreated RTI leads to pelvic inflammatory disease, ectopic pregnancy, miscarriage, cervical cancer and an increased risk of Human Immunodeficiency Virus (HIV) transmission. **Objectives :** (1) To study the prevalence of RTI amongst reproductive age women in rural area (2) To study the proportion of RTI symptoms amongst women attending Out Patient Department (OPD) for the reason other than the complaints of RTI. **Method :** A house to house survey was conducted to find out prevalence of RTI in reproductive age women by semi-structured questionnaire in Singarava village. Women attending Community Health Centre (CHC) OPD were also surveyed about RTI symptoms and attending OPD for the reason other than this complaint was considered as a missed opportunity. **Results :** White discharge and peri-vulval itching were the most common complaints. In this study, prevalence of RTI (at least one symptom of RTI) was 70% in community and proportion of RTI (at least one symptom of RTI) was 67% in women attending OPD. These women were attending OPD for other complaints like fever or Upper Respiratory Tract Infection (URTI). Significant correlation was found between parity and RTI symptoms. As this was an unmet need, neither the woman nor her husband had undergone any treatment for the same. **Conclusion :** Very high prevalence of RTI symptoms was seen in the community.

**Key words :** RTI, Rural area, Unmet Need, Missed Opportunity

### Introduction :

According to World Health Organization (WHO) estimate, around 340 million new cases of curable sexually transmitted infections (STIs) occur every year. The figure does not include HIV or other viral STIs like Hepatitis B, genital herpes, and genital warts, which are not curable. The most common of the curable STIs are Gonorrhoea, Syphilis, Chlamydia, and Trichomoniasis. STIs constitute a significant health burden and increase the risks of transmission of HIV. <sup>[1]</sup> Reproductive tract infection (RTI) is a global health problem among women, living in South East Asian Region (SEAR) countries. Studies have found the prevalence of RTI in India, Bangladesh, Egypt, and Kenya is in the range of 52–90 per cent. More than a million women and infants die of the complications of RTI every year. <sup>[2]</sup> RTIs are caused by organisms normally present in the reproductive tract or introduced from the outside during sexual contact or

medical procedures. These different but overlapping categories of RTI are called endogenous, STIs and iatrogenic, reflecting how they are acquired and spread. <sup>[3]</sup> The social stigma usually associated with STIs may result in people seeking care from alternative providers or not seeking care at all. The prevalence of self-reported RTI symptoms among Indian women has been found to be 11% - 18% in nationally representative studies <sup>[4, 5]</sup> and 40% - 57% in various other studies <sup>[6-8]</sup>, while the prevalence of laboratory-diagnosed RTIs has ranged from 28% to 38%. <sup>[9, 10]</sup> According to studies that have explored women's patterns of seeking treatment for RTI symptoms, between one-third and two-thirds of symptomatic women did not seek treatment <sup>[6, 8-10]</sup>. RTIs being serious diseases in their own right, they enhance sexual transmission of HIV infection. The presence of untreated STIs/ RTIs can increase the risk of both acquisition & transmission of HIV by a factor of up to 10. <sup>[11]</sup>

**Objectives :**

- 1) To study the prevalence of RTI amongst women of reproductive age group in rural area
- 2) To study the proportion of RTI symptoms amongst women attending OPD for the reason other than the complaint of RTI

**Method :**

- Study design: Cross Sectional Study
- Period of Study: October 2014
- Sample size: 150 women of reproductive age group
- Data Collection: House to house survey in 50 reproductive age women in Singarva village, 100 women attending Singarva CHC OPD

**Inclusion criteria :**

- For community based study: Those who were present at the time of House visit and give verbal consent.
- For hospital based study: Those who were came to OPD during data collection

A house-to-house survey was carried out to find out prevalence of RTI in 50 reproductive age women by semi-structured questionnaire in Singarava village. Besides this, 100 women who attended CHC OPD were also asked about RTI symptoms. Women attending OPD for the reason other than this complaint were considered as missed opportunity. Efforts had been made for counseling of the women who were having any RTI symptoms, for their treatment and Medical Officer (MO) and Health worker were also informed about their symptoms and assurance was given by MO for further management.

We have considered white discharge, perivulvul itching, lower abdominal pain and ulcer as prevalent RTI symptoms.

**Results :**

House to House study Results:

- 74% (37) women belong to the age group of < 30 years of age, followed by the age group of > 30 years (26%, 13).
- 18% (9) of women were unmarried and 82% (41) were married. Average age of the women was 26.56 years, average years of Active Married Life were 6.02 years and average gap between last two successive births was 1.02 year.
- 70% (35) of women were having at least one RTI symptoms. 68% (34) of women were having complaint of white discharge, 54% (27) were having complaint of perivulvul itching and 12% (6) were having complaint of abdominal pain.

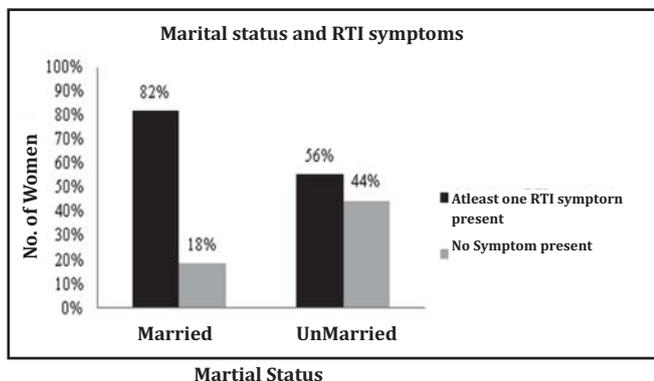
**Centre based study :**

- 75% (75) women belong to the age group of < 30 years of age followed by the age group of >30 years (25%, 25).
- 27% (27) of women were unmarried and 73% (73) were married. Average age of the women was 26.07 years, average years of Active Married Life were 5.08 years and average gap between last two successive births was 1 year.
- 67% (67) of women were having at least one RTI symptoms. This indicates that an opportunity to diagnose any symptoms of RTI condition has been missed.
- 64% (64) of women were having complaint of white discharge, 25% (25) were having complaint of perivulvul itching and 15% (15) were having complaint of abdominal pain.

**Combined Results :**

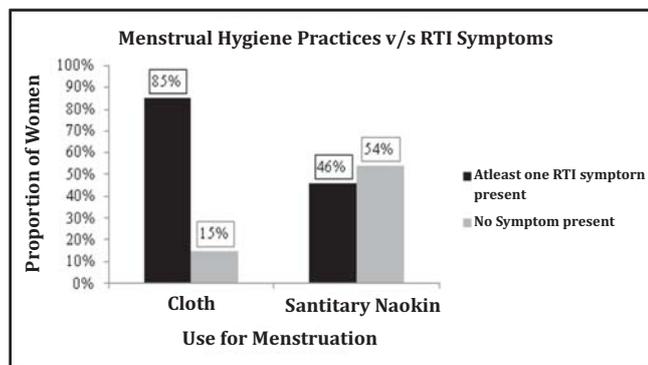
Out of total 150 women, 76% (114) were married and 24% (36) were unmarried. 25% (37) were using sanitary napkin and 75% (113) were using cloth. 8% (12) women had undergone treatment for the same in the past. As this was an unfelt need, none of the husband had undergone any treatment for the same. 4% (6) had history of MTP. All married women had single sexual partner and all unmarried women had not sexual exposure.

**Figure 1: Marital Status and RTI Symptom (N=150)**



As observed in figure 1, Out of 114 married women, 82% (93) women had at least one RTI symptom and 18%(21) women had no RTI symptom. Out of 36 unmarried women, 56%(20) women had at least one RTI symptom and 44%(16) women had no RTI symptom. At 95% confidence limit proportion of women having at least one RTI symptom was significantly higher in married women compared to unmarried women with p-value of 0.007 (<0.05).

**Figure 2: Menstrual Hygiene Practices and RTI Symptoms (N=150)**



As observed in figure 2, out of 113 women using cloth, 85%(96) women had atleast one RTI symptom and 15%(17) women had no RTI symptom. Out of 37 women using sanitary napkin, 46% (17) women had atleast one RTI symptom and 54%(20) had no RTI symptom. At 95% confidence limit proportion of women having at least one RTI symptom was significantly higher in married women compared to unmarried women with p-value of 0.001 (<0.05).

**Table 1: Parity wise Proportion of Married Women and Prevalence of RTI Symptoms**

Parity (n)	Married Women		Married Women having at least One RTI symptom	
	No	%	No	% of Married Women with 'n' parity
0	21	18%	15	71%
1	43	38%	36	84%
2	37	32%	32	86%
3	9	8%	8	89%
4	4	4%	4	100%
<b>Total</b>	114		95	

Table 1 shows parity wise proportion of married women surveyed with prevalence of RTI symptoms. 88% (101) of women out of 114 married women were pregnant for 2 or less number of times (irrespective of its results). Only 12% (13) of married women were pregnant for more than 2 times. (Irrespective of its results)As Shown in the table, 71% (15) of married women having zero parity had at least one RTI symptom. 86% (32) of married women with two parity had at least one RTI symptom. 100% (4) of married women having with parity had at least one RTI symptom. At 95% confidence limit, proportion of women having at least one RTI symptom was significantly higher in married women having more parity compared to women with less parity with p-value of 0.001 (<0.05).

**Discussion:**

In this study the prevalence of RTI/STI symptoms was found to be 70% in house to house study and proportion was 67% in center based study. Such high proportion of RTI/ STI symptoms in Centre Based Study shows that an opportunity to diagnose the RTI Condition has been missed amongst those who visited the CHC.

In a study conducted by Kosambiya et al. in Surat, the prevalence of RTI/STIs was in urban (69%) and in rural area (53%).<sup>[12]</sup> White discharge was the most common reported symptom followed by peri-vulvul itching and then lower abdominal pain. In a study conducted by Anjana Verma et al. in New Delhi, vaginal discharge (77%) was reported as the most common symptom by the rural women, followed by lower backache (51%) and lower

abdominal pain (26%).<sup>[13]</sup> Our study revealed that overall prevalence of RTIs was maximum (89%) in women who were having Three or more children and minimum (71%) in women who had one or no child. This difference was statistically significant (P value = 0.001). Though prevalence of RTI symptom in multiparous women (>3 children) is very high in our study due to small sample size, this finding is comparable to a study done by Rani et al., in Gorakhpur, which revealed that overall prevalence of RTIs was maximum (42%) in women who were having five or more children and minimum (34%) in women who had one or no child.<sup>[14]</sup> Similar finding was reported in a study done in Ludhiana by Philip et al. in which it was found that the prevalence of the symptoms increased with parity, with the prevalence being lowest (8%) in the nulliparous and highest (25%) in the multiparous with parity >4. The prevalence was 17% in those with parity 1-2 and 18% in those with parity 3-4.<sup>[15]</sup>

All married women had single sexual partner and all unmarried women had not sexual exposure. Although married women gave history that they had only one sexual partner and unmarried women that they had no sexual exposure, but it is highly subjective. We had asked about history of condom use but women were very reluctant to answer this question so we have not included this information in the study.

### Conclusion :

Prevalence of RTI was 70% in the Community. Proportion of RTI was 67% in the Centre based study which was considered as missed opportunity. Proportion of women having at least one RTI symptom was significantly higher in married women compared to unmarried women. Proportion of women having at least one RTI symptom was significantly higher in women using cloth compared to sanitary napkin.

It is recommended whenever the woman attends the OPD she should be asked about RTI symptoms irrespective of complaint for which she had visited the healthcare centre and prompt treatment should be provided. Health worker should be advised to spread awareness in the community for different RTI symptoms, their treatment and using of sanitary napkins. The availability of the RTI/STI

treatment kits should be ensured in all the government healthcare centers.

### Declarations :

Funding : Nil

Conflict of interest : Nil

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## Knowledge, Attitude and Practices towards Bio-Medical Research amongst the Postgraduate Students of Smt. N.H.L Municipal Medical College of Ahmedabad

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### Abstract:

**Introduction** : Every doctor should strive to contribute to the generation of evidence by conducting research. A review of literature showed that the data regarding knowledge, attitude, practice towards medical research among postgraduate students pursuing postgraduate studies in India is lacking. **Objectives** : To assess research-related knowledge, attitude and practices of post-graduation students of Smt. N.H.L municipal Medical college of Ahmedabad, Gujarat. **Method** : A cross-sectional study was carried out during November-December 2015. A total number of 221 postgraduate students were interviewed for knowledge, attitude, and practices related to Bio-medical research by using a Questionnaire method. Findings were analyzed using appropriate software. **Results** : In present study, out of total 221 students, 53.4% had taken training of research methodology. The full form of ICMR was identified correctly by 87% students, 59% of knew the full form of MEDLARS. Only 45% were aware about seeking approval for conducting clinical research. The association between research methodology training and knowledge was statistically significant ( $p < 0.05$ ). Almost 95% postgraduate students agree for conducting training compulsory for research methodology. About 61% of the students believed that the lack of time due to vast curriculum of postgraduate subject for poor research activity. **Conclusion** : Postgraduate students have unsatisfactory knowledge about bio-medical research. They have positive attitude towards research, but they have failed to transform their Knowledge and attitude in actual practice due to various factors and to have a multi-faceted program to encourage postgraduate students to carry out research.

**Keywords** : KAP, Bio-Medical research, Postgraduate students

### Introduction :

It is the duty of every doctor to care for his patients and provide the best available treatment. The duty of care also requires doctors to keep their medical knowledge and training up-to-date. Doctors should provide effective treatments based on the 'best available evidence'. It is widely accepted that evidence-based medicine has contributed significantly to the practice of medicine and advancement of medical science. Every doctor should strive to contribute to the generation of evidence by conducting research.<sup>[1]</sup> Training for research skills and experience of research early in career has been associated with continued professional academic work and may help inform residents career decisions.<sup>[2]</sup> It is seen that research programs in medical colleges get the lowest priority. There are a numbers of reasons, including lack of funding and manpower resources, responsible for the poor quality in research oriented Medical education.<sup>[3]</sup> As

per the Medical Council of India (MCI) requirements, postgraduate students have to carry out a dissertation project as a part of their MD/MS curriculum. It is a common observation that a majority of postgraduate students conduct research projects during the second or third years of residency.<sup>[4]</sup> In order to encourage research orientation in postgraduate students, currently MCI has made it mandatory to not only attend one international/national conference, but also give an oral/poster presentation and send the Article for publication.<sup>[5]</sup>

A review of literature showed that, the data regarding knowledge, attitudes and practices toward biomedical research is lacking among postgraduate students pursuing postgraduate studies in India.<sup>[6]</sup> It is felt that the existing level of knowledge and awareness among the second and third year postgraduate students, who have already conducted / are conducting at least one research study for their

dissertation, should be evaluated. Therefore, we have decided to undertake a cross-sectional study to assess research-related knowledge, attitude, and practices of postgraduate students of a tertiary care hospital affiliated to a medical college in Ahmedabad.

#### Objectives:

1. To study the socio-demographic profile of postgraduate students
2. To assess research-related knowledge, attitude and practices of postgraduate students
3. To find out difficulties faced by postgraduate students in conducting medical research
4. To suggest measures to improve research related knowledge and attitude among PG students based on the study findings

#### Method:

**Study design:** Cross-sectional Study

**Study Sample:** 484 postgraduate students admitted to the MD/MS course. 153, 166 and 165 students from first, second and third year of PG course were enrolled in the study. In the present study, only 2nd year 110 (66.26%) and 3rd year 111 (67.27%) students, total 221 (45.66%) PG students were including too consented to participate.

**Sample size:** 221 (who had consented to participate)

**Period of study:** November - December, 2015

**Study area:** Smt. N.H.L Municipal Medical College of Ahmadabad (VS General Hospital)

**Sampling technique:** Non-probability convenience sampling technique

**Inclusion criteria:** All the specialties of faculty including clinical, para-clinical & preclinical graduate students who gave verbal consent to participate in the study

**Exclusion criteria:** Postgraduate students not available on the day of visit

Semi-structured Questionnaire method was employed for data collection.

Approval from concerned authorities of hospital and departments was ensured. The data collected and entered in the excel 2007 worksheet and analyzed by using appropriate software.

#### Data collection tool:

A predesigned semi-structured questionnaire was prepared and was divided in three parts. The first part is the collection of demographic information of the postgraduate students including age, gender, academic year, and specialty. The questions in the second part of the questionnaire assess the knowledge about research methodology, their attitude and practice in research. The third part of the questionnaire was about assessing difficulties faced by post graduate student in conducting medical research. Study participants were enrolled in the study after explaining the purpose of the study and having informed consent. The process of data collection did not interfere with the work of hospital and confidentiality of the student was ensured.

**Table 1: Socio-demographic profile of post graduate students (n=221)**

Demographic profile	Number (n=221)	Percentage (%)
<b>Gender</b>		
Male	155	70.1
Female	66	29.9
<b>Age (in year)</b>		
25-26	69	31.2
27-26	113	51.1
>29	39	17.6
<b>Marital status</b>		
Married	98	44.3
Unmarried	123	55.7
<b>Speciality</b>		
Clinical	196	88.7
Para-clinical	22	10.0
Pre-clinical	3	1.4
<b>Year of Post-Graduation</b>		
Second year	103	46.6
Third year	118	53.4

Table 1 shows that socio-demographic profile of postgraduate students, 70.1% respondents were males and 29.9% females. About 51.1% of the students belong to the age group of 27-28 years followed by 31.2% in the age group of 25-26 years. Mean age of the study population was 27.21 with SD 1.323 years. Among total students, 55.7% were unmarried while 44.3% married. Majority (88.7%) postgraduate students belonged to clinical departments, 10% from para-clinical departments.

**Table 2: Assessment of research-related knowledge of postgraduate students (n=221)**

Questions	Yes (%)	No (%)
Have you taken in any research methodology training?	118 (53.4)	103 (46.6)
	<b>Correct (%)</b>	<b>InCorrect (%)</b>
What is the full form of ICMR?	193 (87.3)	28 (12.7)
What is the full form of MEDLARS?	131 (59.3)	90 (40.7)
From whom to seek approval for conducting clinical research using new drugs in India?	99 (44.8)	122 (55.2)
What is the full form of CTRI?	101 (45.7)	120 (54.3)
What is cohort study?	80 (36.2)	141 (63.8)

**Table 3 : Association between Training of research methodology and knowledge (n=221)**

Knowledge		Taken for training of research methodology		Chi-square Test
		Yes	No	
Full form of ICMR	Correct	133	80	$\chi^2 = 16.271$ P<0.05
	Incorrect	5	23	
Full form of MEDLARS	Correct	90	41	$\chi^2 = 30.294$ P<0.05
	Incorrect	28	62	
Seek approval for conducting clinical research using new drugs in India	Correct	73	26	$\chi^2 = 29.826$ P<0.05
	Incorrect	45	77	
Full form of CTRI	Correct	69	32	$\chi^2 = 16.646$ P<0.05
	Incorrect	49	71	
What is cohort study?	Correct	54	26	$\chi^2 = 10.027$ P<0.05
	Incorrect	64	77	

**Table 2** Shows that out of 221 postgraduate students (118)53.4% students had taken research methodology training. Whereas 87.3% students aware about the ICMR, 59.3% students know the full form of MEDLARS and 45.7% students know about the full form of CTRI respectively. 44.8% of the students concerned about the approval for conducting clinical research. 36.2% PG students were known about the concept of cohort study.

**Research methodology related knowledge**

We had analyzed the questions concerning about research methodology. We had included the

various questions in the study which were about the concept of research methodology. Thus depending upon this analysis we had classified their knowledge into categories of satisfactory and unsatisfactory.

**Table 3** shows that statistically proved, a significant difference was found in the students who had taken training of research methodology. This difference is also observed in knowledge, indicating a highly probable association between the two variables. It is also supported by chi-square at the  $p<0.05$

**Table 4 : Association between Research methodology training during different phase and knowledge (n=221)**

Knowledge		Research methodology training during different phase			Chi-square
		Undergraduate	Internship	Postgraduate	Test
Full form of ICMR	Correct	79	5	29	$\chi^2 = 10.900$ P<0.05
	Incorrect	2	2	1	
Seek approval for conducting clinical research	Correct	56	4	13	$\chi^2 = 6.248$ P<0.05
	Incorrect	25	3	17	
Full form of MEDLARS	Correct	64	6	20	$\chi^2 = 2.210$ p>0.05
	Incorrect	17	1	10	
Full form of CTRI	Correct	48	5	16	$\chi^2 = 0.831$ p>0.05
	Incorrect	33	2	14	
What is cohort study	Correct	36	1	17	$\chi^2 = 4.288$ p>0.05
	Incorrect	45	6	13	

**Table 5 : Assessment of research-related attitude of postgraduate students (n=221)**

Questions	Agree (%)	Strongly agree (%)	Disagree (%)	Strongly disagree (%)
Research methodology syllabus in undergraduate curriculum	114 (51.6)	94 (42.5)	12 (5.4)	1 (0.5)
Should training for research methodology, be made compulsory for postgraduate student?	104 (47.1)	106 (48.0)	10 (4.5)	1 (0.5)
Does patient outcome improve with continued medical research?	102 (46.2)	106 (48.0)	12 (5.4)	1 (0.5)
Should research time, be allotted separately while planning postgraduate curriculum?	87 (39.4)	125 (56.6)	7 (3.2)	2 (0.9)

**Table 4** describes association amongst knowledge of those who have taken training during different phase like undergraduate, internship and postgraduate. We found that those who have taken training during undergraduate had better knowledge and it was key feature in more correct answer-scoring better results (for example aware seek approval for conducting clinical research). The chi-square value was 6.248 at  $p < 0.05$ . Undergraduate had better knowledge as compare postgraduate.

**Table 5** shows that 51.6% of the post-graduation students agreed and 42.5% strongly agreed that research methodology syllabus should be in undergraduate curriculum. 47.1% agreed and 48% strongly agreed that research methodology training should be compulsory for postgraduate students. 46.2 % agreed and 48% strongly agreed that patient outcome improves with continued medical research. 39.4% agreed and 56.6% strongly agreed that a separate time should be allotted in the curriculum for research activities.

**Table 6 : Association between Training of research methodology and attitude (n=221)**

Attitude				Chi-square Test
		Yes	No	
Research methodology syllabus in undergraduate curriculum	Agree	115	93	$\chi^2 = 5.102$ P > 0.05
	Disagree	3	10	
Training for research methodology be made compulsory for postgraduate students	Agree	116	94	$\chi^2 = 5.760$ P > 0.05
	Disagree	2	99	
Dose patient outcome improve with continued medical research	Agree	115	31	$\chi^2 = 5.102$ P > 0.05
	Disagree	3	0	
Research time be allotted separately while planning postgraduate curriculum	Agree	116	96	$\chi^2 = 3.663$ P > 0.05
	Disagree	2	7	

**Table 7 : Assessment of research-related practices of postgraduate students (n=221)**

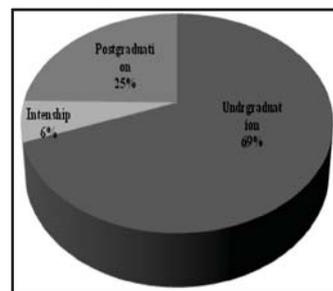
Questions	Yes (%)	No (%)
Do you have experience of writing research paper?	174 (78.7)	47 (21.3)
Do you regularly read journals	170 (76.9)	51 (23.1)
Do you have publication in journals during your PG?	83 (37.6)	138 (62.4)
Have you presented research paper in a conference during your PG?	173 (78.3)	48 (21.7)
Have you presented poster in a conference during your PG?	211 (95.5)	10 (4.5)

(Table 6) Surprisingly, there was no statistically significant difference between the two groups of postgraduate students who had attended research methodology training and not attended, and their attitude toward the bio-medical research which was also reflected by the chi-square value at the  $p > 0.05$ .

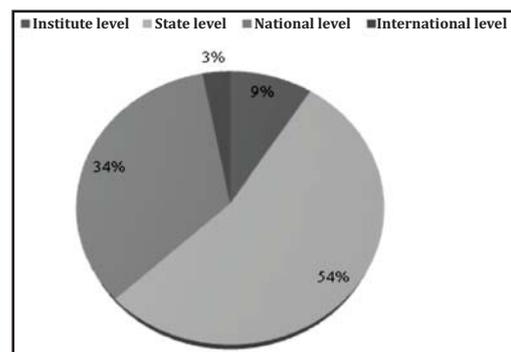
Table 7 shows 78.7% students had experience of writing research paper. 76.9% students read journals regularly. Only 37.6% students had done publications in journals whereas 78.3 % students had presented research paper while 95.5% had presented poster in conference during their post-graduation.

Figure 1 shows the out of total 221 postgraduate students 118 (53.4%) students had taken research methodology training During under graduation 69%, post-graduation 25% and 6% during internship.

**Figure 1: Research methodology training during different phase**

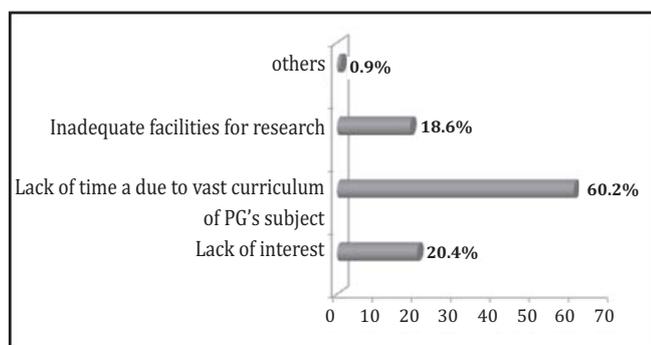


**Figure 2 : Paper and poster presentation in conference at different levels.**



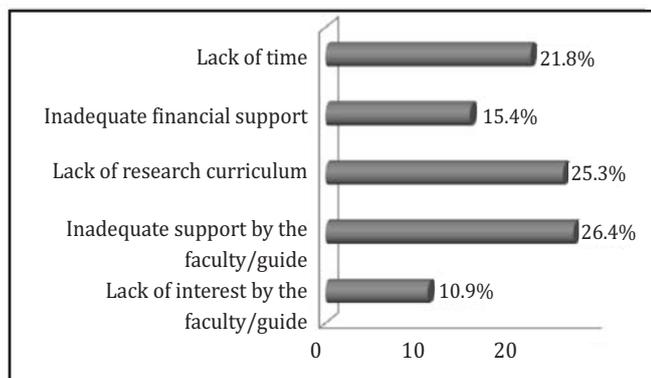
**Figure 2** shows that amount of papers and posters presented at different level conferences in their PG curriculum. About 54% of Postgraduate students had presented their paper or poster at state level conferences. While about 34% at national levels. Only 9% of Postgraduate students had presented their presentation at any institutes. International levels 3% are the least students who had presented at international conference through their post graduation.

**Figure 3 : Difficulties faced by post graduate student in conducting medical research. (n=221) (Personal reasons)**



**Figure 3** shows the major difficulties faced by postgraduate students were conducting medical research. Lack of time due to vast curriculum of PG subject is the main reason which accounted about 60.2% followed lack of interest 20.4% and inadequate facilities 18.6% for research.

**Figure 4 : Difficulties faced by postgraduate student in conducting medical research. (n=221) (Institutional reasons)**



**Figure 4** The Difficulties faced into conducting medical research among postgraduate students. About 26.4% PG students believed that inadequate support was got from their respective faculty or guide. 25.3% of the students thought regarding research curriculum was inadequate for them. Because of heavy workload, 21.8% students believed that they did not have time for research. 15.4% students believed in inadequate funding on research. 10.9% of the Postgraduate students viewed about the lack of interest by their faculty or guide for research.

**Discussion :**

Medical research carried out by undergraduate and postgraduate students in India is disappointing compared to developed countries. To date research has not become a mandatory part of the curriculum of undergraduate of medical education in India. In Germany, where research is an integral part of undergraduate medical curriculum; medical students were involved in 28% of the publications in a particular institution.<sup>[7]</sup>

We carried out this study to assess Knowledge, Attitude and Practices towards Bio-Medical Research amongst the Postgraduate Students. We have taken total 221 of postgraduate students in our research related study and among them 88.7% students were from clinical department, 10% students were from Para-clinical department and 1.4% student's preclinical department in the present study.

Out of total postgraduate students, 53.4% students had taken training of research methodology. Our study revealed that knowledge about the need and prerequisites of research was fairly good among postgraduate students. Most of the postgraduate students showed a positive attitude toward medical research and intended to do research in future career. But there was disparity found with regard to their attitude and actual

practice. Results are comparable to study done in Mumbai. 64% of the postgraduate students had attended research training and workshops but 'Lack of time' was cited as an obstacle for research by 74%. This discrepancy between attitude and practice is a cause of concern and merits further investigation<sup>[8]</sup> the major reasons cited for poor research activity in our study are lack of time due to vast curriculum of post-graduation subjects 60.2% and inadequate support by the faculty or guide 26.4% for medical research. While in a study at Pakistan lack of resources (31%) and poor research training at undergraduate and postgraduate level (17%) were the top reasons for poor research activity<sup>[9]</sup> Similar results were obtained in a study done in Madison, USA; in that study, out of 143 postgraduate students, 85% felt that research experience was desirable, 48% were interested in pursuing research during residency, and only 8% were active in research<sup>[10]</sup> However, two studies that were carried out in Canada and Pakistan reflected a contrasting attitude of postgraduate students that a majority of time in residency should be spent learning the clinical aspects of their specialty and they were unwilling to sacrifice personal time for research.<sup>[11, 12]</sup> A study done by Sumi also revealed that most physicians (93.2%) wanted to attend lectures or seminars on one or more topics related to clinical research.<sup>[13]</sup> Among respondents, 68% of physicians reported current participation in clinical research and 74% reported past participation in clinical research.<sup>[14]</sup> In the present study, 78.7% students had experienced of writing research paper and 76.9% students were reading journals regularly. Results were compared to the study done in Rajkot and Loni Maharashtra. Study conducted at Rajkot showed that the writing protocol was present in about in 32% and publications were in journal 15%.<sup>[15]</sup> A study at Loni suggested that the data of writing protocol was present in 71% and publication in journal was 36%.<sup>[16]</sup> These studies showed various key findings

about the knowledge, attitude and practice of bio-research among postgraduate students that would be of interest to medical educators and policy makers. The Board of Governors of the MCI came out with 'Vision 2015' (GME Regulations 2012), that contains many notable recommendations for the improvement of the current system including research methodology training as an elective.<sup>[17,18]</sup> If these are implemented as mandatory in curriculum, the impact of improvement in Indian medical research will be felt globally.

### Conclusion :

In the present study, it was found that postgraduate students had unsatisfactory knowledge of bio-medical research. They had positive attitude towards research, but they have failed to transform their knowledge and attitude in actual practices due to lack of time in their vast curriculum of postgraduate subjects and inadequate support by the faculty or guide and inadequate infrastructure. There is need to encourage postgraduate students to carry out research through a multi-faceted program including provision of technical assistance and essential infrastructure during their postgraduate training program as well as training of their guides but we looking at our finding we strongly suggest that research methodology training must be mandatory in undergraduate.

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**Study on Female Sterilization in PHC of Dahod District during the Year 2013-14**Kalpesh Baria<sup>1</sup>, Jay K. Sheth<sup>2</sup>, D. V. Bala<sup>3</sup><sup>1</sup> Resident, <sup>2</sup> Assistant Professor, <sup>3</sup> Professor & Head, Community Medicine Department, Smt. N.H.L. Municipal Medical College, Ahmedabad**Correspondence** : Dr. Kalpesh Baria, E-Mail:kbaria27@gmail.com**Abstract:**

**Introduction** : India became the first country in the world to launch an official family planning program with the aim of reducing population growth. The current fertility norm in India is two children. **Objectives** : (1) To study distribution of Female Sterilization operation cases of PHC during the year 2013-14. (2) To study 2 child norms & gender preference among female sterilization cases. **Method** : Retrospective record based study of 207 Female sterilization cases from a tribal PHC for the year April 2013-March 2014 was carried out from the PHC records. **Results** : Agriculture was the primary occupation of all the cases. Higher numbers of cases were motivated by the ASHA Worker 42.5% followed by FHW 26.1%. Median age for female sterilization is 28 years. 63.28% female have done their Tubal Ligation (T.L.) operation in the age group of 25-29 years followed by 22.71% in age group of 30-34years. Against the current fertility norm of 2 children, 21.3% females have 2 children while 38.2% females have 3 children & 28% females have 4 children with 3.29 as the mean number of live children at the time of operation. Majority of females (78.3%) and their husband (57.4%) were illiterate. Majority of cases were operated in winter season (88.4%) which reveals that winter is the most preferred season for any surgical operation by the community. Majority were operated in government setup (86.95%) followed by Private (13.05%). Being a tribal PHC of a tribal district 93.24% cases were from ST category. Majority (85.5%) were from BPL category. 75% females have their last child of age 1 year or less.

**Key words** : Female sterilization, Medical Records**Introduction :**

In 1952, India became the first country in the world to launch an official family planning program with the aim of reducing population growth.<sup>[1]</sup> During the initial phase of the family planning program, the rhythm method was the only birth control method recommended by the government. Because of the high rates of failure for this method, in 1956 the government began to offer condoms, diaphragms and spermicidal jelly<sup>[2]</sup> to couples free of charge through hospitals, health centers and birth control clinics, and this "clinic approach" continued until the 1960.<sup>[2]</sup> Male and female sterilization were introduced in 1966, and the government established method specific targets for health workers to achieve.<sup>[3]</sup> A new family planning agenda focusing on voluntary acceptance of family planning evolved in the 1980s following the political fallout over the coercive sterilization program of the Emergency.<sup>[4]</sup> During this era, method acceptance shifted from male

sterilization to female sterilization. This shift is largely explained by the development of laparoscopic techniques for female sterilization; misconception and concerns about the side effects of vasectomy, such as loss of libido; and the development of women-centered program, such as the Reproductive and Child Health program. The current fertility norm in India is two children.<sup>[6]</sup> Women are encouraged to marry early and complete childbearing soon thereafter. Typically, women are sterilized once they achieved their desired family size.<sup>[7]</sup> Thus, sterilization tends to occur relatively early, and age at sterilization is declining significantly in some states.<sup>[8]</sup>

**Objectives :**

- 1) To study distribution of Female Sterilization operation cases of PHC during the year 2013-14.
- 2) To study 2 child norms & gender preference among female sterilization cases.

**Method:**

Dahod is a tribal district in the state of Gujarat. One of the tribal Primary Health Centre (PHC) from this district was selected for the purpose of the study. Retrospective record based study was carried out from the records of female sterilization operation carried out during the year April 2013 to March 2014 from the PHC. A total of 207 female sterilization registered cases during the year 2013-14 were included in the study. Data were analysed by appropriate statistical software.

**Results:**

All the 207 cases were analysed to find out the distribution pattern and factors affecting female sterilization operation. Primary family occupation of all the cases was agriculture.

**Table 1 : Distribution of Female Sterilization (n=207)**

According age of female	Frequency	Percentage (%)
<20	00	00
20-24	29	14.01
25-29	131	63.28
30-34	47	22.71
35+	00	00
<b>Mean age (years)</b>	27.29	
<b>Median age (years)</b>	28.00	
<b>Caste</b>		
ST	193	93.24
OBC	8	3.86
General	5	2.41
Muslim	1	0.49
<b>Economic status</b>		
BPL	177	85.5
APL	30	14.5

Table 1 shows distribution of 207 female sterilization cases registered during the year 2013-14 at a tribal PHC. Distribution according to age of

women, Majority (63.28%) female have done there T.L operation in the age group of 25-29 years followed by 30-34 years (22.71%) and 20-24 years (14.01%). Mean age for female sterilization is 27.29 years. Median age is 28 years. Being a tribal PHC of a tribal district 93.24% cases were from ST category. Majority (85.5%) were from BPL category.

**Table 2 : Distribution of Female Sterilization (n=207)**

According to Motivator	Frequency	Percentage (%)
FHW	54	26.1
MPH	40	19.3
WASHA worker	88	42.5
AWW worker	20	9.7
Anganwadi Helper (Tedaghar)	05	2.4
<b>According to level of worker</b>		
Sub-center level	94	45.41
Village level	113	54.59
<b>Season</b>		
Summer	07	3.4
Monsoon	17	8.2
Winter	183	88.4
<b>Place of operation</b>		
Government hospital	180	86.95
Private hospital	27	13.05

Table 2 shows distribution of T.L. cases according to the motivator shows highest number of cases were motivated by the ASHA Worker (42.5%) followed by FHW (26.1%) & MPH (19.3%). Table-1 also shows that maximum cases (88.4%) are operated in winter season. It also shows that maximum number of cases operated in government institute that is 86.95% where as 13.05% in private hospitals.

**Table 3 : Distribution of Female Sterilization (n=207)**

According to Motivator	Frequency	Percentage (%)
1	02	1.0
2	44	21.3
3	79	38.2
4	58	28.0
5 & more	24	11.0
<b>Mean no. of live children</b>	3.29	
<b>Median &amp; Mode of Live children</b>	3.00	
<b>Age of last child</b>		
0-2 months	44	21.26
3-6 months	42	20.29
7-12 months	74	35.75
13-24 months	47	22.70
> 2 years	5	2.41

Table-3 also shows 38.2% females have 3 children, 28% females have 4 children, 21.3% females have 2 children, 1% female has 1 child, 0.5% female each have 6 & 7 children. Female having Mean number of live children is 3.29. Median number of live children is 3.75% females have their last child of age 1 year or less.

**Table 4 : Distribution of Female Sterilization (n=207)**

Education of female	Frequency	Percentage (%)
Illiterate	162	78.3
Primary	20	9.7
Secondary	18	8.7
Higher secondary & above	07	3.3
<b>Education of Husband</b>		
Illiterate	119	57.4
Primary	32	15.5
Secondary	32	15.5
Higher secondary & above	24	11.6

Table-4 shows education of wife & husband of the 207 cases. 78.3% females were illiterate, 9.7% had education up to primary, 8.7% up to secondary, 3.3% up to higher secondary education & above. Education level of husband shows 57.4% are illiterate, 15.5% had education up to primary, 15.5% up to secondary and 11.6% up to higher secondary & above.

**Table 5 : Distribution of Live child at the time of operation**

No. of live child	Male	%	Female	%
0	1	0.49	43	20.77
1	45	21.74	78	37.68
2	137	66.18	58	28.02
3	19	9.18	21	10.14
4 & more	5	2.42	7	3.38

Table 5 shows that 43 couples (20.77%) do not have any live female child at the time of operation whereas only 1 couple (0.49%) do not have any live male child at the time of operation. Most couples 206 (99.51%) had at least one live male child at the time of operation, as compared to 164 (79.23%) had at least one live female child at the time of operation.

**Discussion :**

As per the National Family Health Survey (NFHS)-3 public medical sector contributed about 81.7% of coverage of female sterilization while private medicate sector and NGO contribute about 18.3% of female sterilization. [8] In the current study, similar results were also seen in the present study where coverage of female sterilization covered by public medical sector (CHC, District hospital) contributed about 86.95% of total female sterilization, while private medical sector contribute about 13.05%.

Study carried out by Burnolli Dutta in India on female sterilization shows similar results. Majority of the clients in this study (38.8%) were in the age group of 25-29 years, which also matches well with the results of the present study in which 63.28% sterilization was carried out in the age group of 25-

29 year.<sup>[8]</sup> Study by Burnolli Dutta also shows the females who had done their sterilization with secondary education (70%) and females with primary education (22%), only 7% women with higher education. This may be because of the fact that in rural areas women are mainly primary to secondary educated and highly educated women prefer more for spacing methods of contraception.<sup>[1]</sup> In this current study the rural population were mainly illiterate. About 78.26% of women were illiterate, while only 3.38% female had higher education. Comparing the education of females and their husbands, it shows that in this tribal area, husbands are more educated than wife. Since majority of cases are operated in winter and very few in other seasons, it reflects that winter is the most preferred season for any surgical operation by the community. It also shows more number of cases motivated by village level workers than sub-center level workers. This may be because local workers like ASHA (Accredited Social Health Activist)/AWW (Anganwadi Worker) are from the same locality & so are successful as motivator for cases.

The results also reflect that couples do not prefer to go for permanent method of sterilization when they do not have any live male child. On the other side, many couples without a female child selected to go for permanent sterilization procedure of females when they do not have any live female child. This reflects preference for "male child" prevalent in the community. At least one live male child is the "social norm" to be fulfilled before motivating them for a permanent method.

### Conclusion :

Majority of cases are operated in winter season in government institute. Husbands are more educated than wives are. Majority of females are motivated by village level worker. Couples prefer to have at least one live male child before permanent sterilization. Less than 25% of couples follow 2child norm.

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**Cardio Respiratory Fitness Testing in Spinal Cord Injury Patients Using 6 Minute Push Test**Ravi Solanki<sup>1</sup>, Pooja Chaudhari<sup>2</sup>, Anjali Bhise<sup>3</sup><sup>1</sup>Tutor, Department of Physiotherapy, Government Spine Institute and Physiotherapy College, Civil hospital, Ahmedabad<sup>2</sup> Post Graduate Student, School of Public Health, University of Texas, USA<sup>3</sup> Principal, Government Spine Institute and Physiotherapy College, Civil, Hospital, Ahmedabad.**Correspondence** : Dr. Ravi Solanki, E-Mail: ravibsolanki@gmail.com**Abstract:**

**Introduction** : 6-minute Push test has been demonstrated as a reliable and valid measure for testing aerobic fitness in patients with spinal cord injury. Purpose of this study was to assess aerobic fitness in patients with spinal cord injury using 6-minute push test and Heart rate recovery. **Method** : Total 47 spinal cord injury patients were randomly selected for the study. 6-minute push test distance and heart rate recovery were assessed. Mean 6-minute push test distance was calculated. Relationship between 6-minute push test distance and heart rate recovery was analyzed by calculating correlation coefficient(r). **Results**: Mean 6-minute push test distances calculated for the paraplegics and the tetraplegics were 280 and 148 meters respectively. 6-minute push test distance was positively correlated(r=0.87) with heart rate recovery. **Conclusions**: Patients with larger 6-minute push test distance are having faster heart rate recovery.

**Keywords**: 6 Minute Push Test, Aerobic Fitness, Paraplegics**Introduction :**

Spinal cord injury induces motor pareses of substantial parts of the skeletal musculature. In the vast majority of the disabled individuals, physical mobility and regular daily activities are reduced. This leads to a considerable impairment of physical fitness and a loss of peak oxygen uptake and metabolic demands. The concomitant increase of cardiovascular risk factors leads to a higher incidence of diseases of the cardiovascular system. From a public health prospective, identifying persons who could most strongly benefit from exercise interventions, that is, persons with "low" fitness, is more valuable than estimating their precise aerobic capacity. Several field tests have been developed to assess the aerobic capacity of persons with spinal cord injury. 6-minute push test (MPT) is a clinic friendly approach to identify cardiovascular fitness level in persons with spinal cord injury. It measures total distance which can be propelled using wheelchair by the subjects in 6 minutes. It has been validated as a measurement which is sensitive to fitness differences and identifies individuals with low fitness. <sup>[1]</sup> The 6-minute push test demonstrates acceptable reliability with intra-class correlation

coefficient (95% confidence interval) exceeding 0.90 for the whole sample (0.97 (0.94–0.98)) and the tetraplegics (0.93 (0.80–0.98)) and paraplegics (0.97 (0.93–0.99)) subsets. Increased Vagal activity associated with a faster HR recovery has been shown to be associated with a decrease in risk of death.<sup>[2]</sup> For this reason, several recent studies have looked at HR recovery after exercise as a prognostic tool.<sup>[1]</sup> Previous study has been done in western population to find out average 6-minute push test distance for paraplegics and tetraplegics.<sup>[1]</sup> But lack of information exists about average 6-minute push test distance in Indian population and its relationship with heart rate recovery.

**Method :**

47 (out of 80) individuals with spinal cord injury or spinal cord disease were selected for the study by simple random sampling. All subjects voluntarily provided written informed consent and completed the Institutional Review Board–approved research protocol. All subjects were given identity number and confidentiality was maintained. Inclusion criteria were as follows: age 18 years or older, self-reported Spinal Cord Injury (SCI), self-reported ability to independently self-propel a

**Table 1 : Mean 6-minute push test distance in paraplegics and tetraplegics**

Injury Category	Age (Mean ± SD) years (Mean ± SD)	Male	Female	6 MPT distance
Paraplegics (n= 35)	42.6 ± 12.34	29	8	280 ± 71.36 m
Tetraplegics (n= 12)	39.5 ± 9.81	9	3	148 ± 34.87 m

manual wheelchair and ability to complete testing in their personal manual wheelchair. Individuals meeting any of the following criteria were excluded: self-reported unstable angina or myocardial infarction within the past month, resting HR >120, systolic blood pressure 180 mm Hg, or diastolic blood pressure >100 mm Hg. Exclusion criteria were consistent with the American Thoracic Society (ATS) relative or absolute contraindications for performing the 6-minute walk test.<sup>[3]</sup> Participants self-reported injury level (i.e., tetraplegia (TP) (C5–C8) or paraplegia (PP) (T1–L2). Self-report was confirmed with a brief assessment of active range of motion against gravity (elbow flexion (C5), wrist extension (C6), elbow extension (C7), and gross Opening/closing of the hand (T1)). Participants who could not complete all of these motions were classified as tetraplegic. The study was approved by institutional ethical committee

### Procedure for 6-minute Push test

We conducted the 6-MPT in a moderately busy hallway of an academic research center and individuals were tested in their personal wheelchair. The course was a 30-m loop, marked by two cones spaced 15 m apart (30-m loop) with 2.8 m on either end to allow for turning. Two 180 degree turns were required to complete one 30-m loop. Beyond space, the only required equipment was a lap counter and pylons to mark the ends of the loop. ATS guidelines and instructions for the administration of the 6MPT were followed.<sup>[3]</sup> A standardized pretest script instructed participants to propel as far as possible on the propulsion course and advised that they could slow or stop at any point during testing. During the test, standard feedback was given at recommended intervals. Participants completed all testing in their

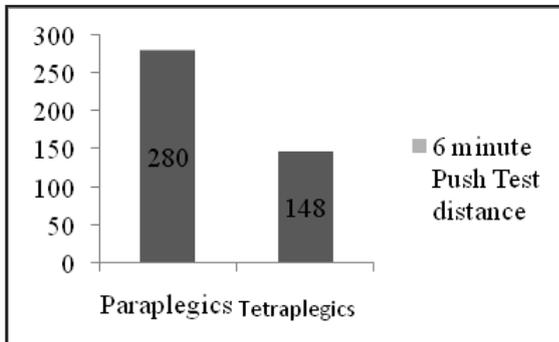
personal wheelchair. At the end of test, peak Heart Rate (HR) was recorded using Polar heart rate monitor. After 1 minute, decline in Peak heart rate was recorded to estimate heart rate recovery. Following testing order was used for each 6-MPT: a 2-min self-selected slow velocity practice test, a 20-min rest, followed by the 6-MPT. The 2-min practice test was completed on a shortened loop (15 m) to allow for more turning practice. For the practice test, participants were instructed to propel at comfortable velocity as if they were pushing around a grocery store, turning in the direction of their choice. Total number of laps completed by the subject was recorded using pen and paper. Distance traveled in 6 min (m) was computed by multiplying the number of completed laps by 15 m and adding the distance traveled in the last lap. Distance traveled in the turns was not measured.

### Results:

Forty seven individuals with Spinal cord injury completed the study. 45 individuals reported traumatic event which included road traffic accidents, fall from height etc. One individual reported tuberculosis and one reported transverse myelitis as the cause of their spinal cord injury. More than half had an injury at T1 or lower (75 % PP, n = 35). Among these individuals, 24 reported injuries between T1 and T9 and 11 reported injuries between T10 and L2. (Table 1)

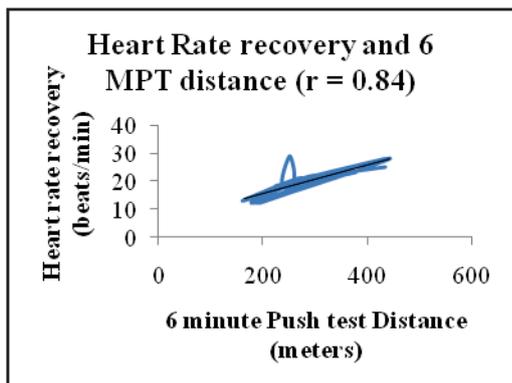
Among individuals with cervical injuries (25%TP, n = 12), nine reported an injury at C5/C6 and three reported injuries at C7/C8. Mean 6 MPT distance for Paraplegics was 280 meters with SD of 71.36 meters. For Tetraplegics it was 148 meters with SD of 34.87 meters. (Figure 1)

**Figure 1: Mean 6-minute Push test distance (meters)**



Rate of decline in Peak HR at end of 1 minute was recorded and was correlated with 6-minute push test distance. The calculated correlation coefficient was 0.84. (Figure 2)

**Figure 2: Heart Rate recovery (after 1 minute) and 6 MPT distance**



**Discussion:**

The 6-MPT has been used across a broad spectrum of populations as a correlate of aerobic capacity and/or functional abilities.<sup>[4-8]</sup> We have extended the possible applications of the 6-MPT by configuring it as a manual wheelchair propulsion test. As administered, the 6-MPT is reliable in persons with Tetraplegia (TP) and Paraplegia (PP). It may also serve this disability group as a field-based test to generate peak aerobic capacity.<sup>[1]</sup>

In the present study, we found that mean 6-minute push test distances for paraplegics and tetraplegics were 280 and 148 meters respectively. Previously study done by Cowan RE et al showed mean 6-minute push test distances of 604 and 445 meters for paraplegics and tetraplegics respectively.<sup>[1]</sup> Distances

covered by spinal cord injury patients in 6 minutes in present study were smaller compared to study done by Cowan RE et al.<sup>[1]</sup> Several factors like racial variations, exercise habits etc. may be responsible for the same. Previously no baseline data was available to assess cardio respiratory fitness in spinal cord injury patients for Indian population. Hence, it was difficult to categorize aerobic fitness of the patient. Present study has provided average 6-minute push test distance for paraplegics and tetraplegics. Hence while testing cardio respiratory fitness, one can compare 6-minute push test distance with the average one and categorize the aerobic fitness of the spinal cord injury patient in above or below average group.

Recently, consideration has been given to the role of HR in recovery as a predictor of mortality. Heart rate recovery is mediated by vagal reactivation, and the rate at which HR declines appears to be a reflection of a faster recovery from the sympathetic drive necessary during exercise. Increased vagal activity associated with The rate of HR return to baseline after exercise is theorized to be due to high vagal tone associated with fitness and good health.<sup>[9]</sup> A drop in HR  $\leq 12$  beats after 1 minute and  $\leq 22$  beats after 2 minutes of exercise has been considered as abnormal response. In the present study we found positive correlation (r = 0.84) between 6-minute push test distance and heart rate recovery. Hence patients who covered larger distances in 6 minutes had faster heart rate recovery. These findings implicate usefulness of monitoring 6-minute push test distance during rehabilitation after spinal cord injury to predict prognosis and to design fitness training programs.

Limitations of the present study include small size and mixed injury level for spinal cord injury patients with predominantly male gender.

**Conclusion:**

In conclusion, the 6-MPT holds potential to be a useful tool for clinicians and researchers. The distance a person with SCI can self-propel in 6 min demonstrated acceptable test-retest reliability. The 6-MPT has been considered a maximal test of aerobic

capacity in persons with injuries above T10. Our initial work suggests that a 6MPT distance less than a threshold value (TP = 148 m, PP = 280 m) correctly identifies most low fitness persons. Further studies are required over larger sample size including equal proportions of male and female gender distributions.

**Declarations :**

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Conflict of interest: Nil

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## **OBITUARY**

### **Dr. B. S. Yadav**

**(1<sup>st</sup> November 1950-22<sup>nd</sup> May 2016)**



The fraternity of Community Medicine suffered a great loss upon demise of Dr. B. S. Yadav on 22 May, 2016. Dr. B. S. Yadav was a nice human being and a very kind person. Dr. B. S. Yadav, MD (PSM) did his MBBS from Gandhi Medical College, Bhopal and MD (PSM) from M. P. Shah Medical College, Jamnagar. He started his service as Tutor of Community Medicine at M. P. Shah Medical College, Jamnagar. Then he served as an Assistant Professor at M. P. Shah Medical College, Jamnagar & Government Medical College, Surat and then promoted to Associate Professor and later on to Professor at M P Shah Medical College, Jamnagar. After retirement he joined Gujarat Adani Institute of Medical Sciences, Bhuj.

The members of Indian Association of Preventive and Social Medicine-Gujarat Chapter and the editorial board of Healthline journal express grief over the demise. May his soul rest in eternal peace.

**Editor in Chief**  
**Healthline Journal**



# મિશન શક્તિ

લોહતત્વની ઉણપથી વધુ થાક લાગે, હાંફ ચડે,  
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