

To Investigate the Performance of Madhya Pradesh in
Terms of Global Social Health Determinants of Under
Nutrition in Mother and Child (Under Age Five)

By

Aayushi Mishra

Dissertation submitted in partial fulfillment of the requirements of the degree

MBA Hospital and Health Management

Academic year, 2017-2019



The IIHMR University, Jaipur

1, Prabhu Dayal Marg, Sanganer, Airport

Jaipur 302029, Rajasthan

Ph: 0141 3924700, Fax: 3924738

Website: www.iihmr.edu.in

To Investigate the Performance of Madhya Pradesh in
Terms of Global Social Health Determinants of Under
Nutrition in Mother and Child (Under Age Five)

By

Aayushi Mishra

*Dissertation submitted in partial fulfillment of award of
MBA Hospital and Health Management/*

Academic year, 2017-2019

*Public Health Foundation of India (PHFI), Gurugram,
Haryana*



The IIHMR University, Jaipur

1, Prabhu Dayal Marg, Sanganer, Airport
Jaipur 302029, Rajasthan
Ph: 0141 3924700, Fax: 3924738
Website: www.iihmr.edu.in

TO WHOMSOEVER IT MAY CONCERN

This is to certify that Ms.Aayushi Mishra, student of MBA Hospital and Health Management from The IIHMR University, Jaipur has undergone internship training at Public Health Foundation of India from 4th-Feb-2019 to 7th-May-2019.

The Candidate has successfully carried out the study assigned to him during internship training and his approach to the study has been sincere, scientific and analytical.

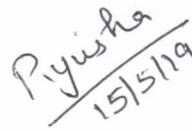
The Internship is in fulfillment of the course requirements.

I wish her all success in all her future endeavors.

A handwritten signature in blue ink, appearing to read 'Dean'.

Dean, Academics and Student Affairs
The IIHMR University, Jaipur

15 May 2019

A handwritten signature in blue ink, appearing to read 'Piyusha' with the date '15/5/19' written below it.

Professor
The IIHMR University, Jaipur



PUBLIC
HEALTH
FOUNDATION
OF INDIA

Ref: T156/09/05/2019

09 May 2019

To whomsoever it may concern

This is to certify that Ms Aayushi Mishra has successfully completed her internship from 04 February 2019 to 07 May 2019 with Public Health Foundation of India (PHFI). During her internship she worked under **Assessing Public Provisioning in Nutrition and Challenges in Service Delivery in Select States in India (APPNA-CSD)**.

During the period of her internship programme with us she was found to be hardworking and sincere.

We wish her the very best in all her future endeavours

For Public Health Foundation of India

Aparajita Roy
Director- Human Resources

Public Health Foundation of India (PHFI)

Plot No. 47, Sector 44, Gurugram, Haryana-122002. India Phone: +91 124 4781400 Fax: +91 124 4781601

Registered Office: 316, 3rd Floor, Rectangle -I Building, Plot No. D-4, District Centre Saket, New Delhi-110017

Phone: +91 11 40057500 Fax: +91 11 40057515

www.phfi.org

CERTIFICATE BY SCHOLAR

This is to certify that the dissertation titled To investigate the performance of Madhya Pradesh in terms of Global Social health determinants of under nutrition in mother and child (under age five) and submitted by (Name) Aayushi Mishra Enrollment No. 0522 under the supervision of Mr. Kaushik Gangualy for award of MBA in Hospital and Health of the University carried out during the period from 2017 to 2019 embodies my original work and has not formed the basis for the award of any degree, diploma associate ship, fellowship, titles in this or any other institute or other similar institution of higher learning.



Signature

Abstract

This study is restricted to Madhya Pradesh, covering all major communities within the region in context to some of the globally identified social health determinants (Zero hunger, No poverty, Safe water and sanitation and good health and well being) .In SDG India index score M.P. comes under the worst performing state ,in this study we are trying identify the inter community variation in context of nutrition related indicators and to identify the ongoing government programs targeted towards the major indicators of undernutrition and how significant relationship between undernutrition and budget allocation is. The study is based on secondary literature from NFHS-4,SDG India index Score, Government report on ICDS and other associated programs. It is found from the study that from all major communities tribal community comes under the most vulnerable community in terms of nutrition related indicator and utilization of government facilities. After comparing the budget allocation on the govt. programs between the tribal and general population it is seen that most of programs in general population have positive significant relationship with prevalence of stunting which is the most important indicators of undernutrition as it reflects long term scarcity of nutritious food whereas in tribal dominated districts very few programs have significant relationship with stunting.

Table of Content

S.no.	Topic	Pg.no
1.	Acknowledgement	8
2.	Introduction	9
	Table-A	10
3.	Literature Review	
3.1	Review of literature on M.P and some its neighboring states	11
	Table-B UNICEF framework of undernutrition	12-15
4	Research question	16
4.1	Objectives	17
4.2	Material and Method	17
5.	Review of statistical evidence on health and nutrition status of communities in M.P.	17
5.1	Status of under nutriton	17
	Table-1-nutrional status of children	18
	Table2- Anemia in children	18
5.2	Factors determining the status of undernutrition in state	18
5.2.1	Safe motherhood	18
	Table-3	19
	Table-4 Place of delivery and postnatal care	20
	Table-5 BMI of mothers	21
	Table-6 Anemia in pregnant and lactating mothers	21
5.2.2	Infant and young child feeding (IYCF)	21
	Table-7 Initial breastfeeding	21
	Table-8 Duration of breastfeeding and diet	22
	Table-9 Non breastfed children	23
5.2.3	Prevalence of diseases and infections in children	23
	Table-11 Prevalence of acute respiratory infection in under five children	24
6.	Utilization of services	24
	Table-12 Utilization of ICDS services	25
	Table-13 ANC visits and IFA consumption	25
7.	Relationship between program expenditure and under five stunting	26
8.	Table-1 Intercommunity variation in expenditure in general population	26
	Tribals and expenditure on programes	27
	Non tribal districts and program expenditure	28

9.	NHM budget and expenditure on maternal and child health	28
	General population and program expenditure	29
	Tribal dominated districts and program expenditutre	29
	Non tribal districts and program expenditutre	30
10	Discussion	
11	Conclusion	

Acknowledgement

I would like to thank Ms. Aparajita Roy (Director- Human Resource, PHFI) & Mr.Kaushik Ganguly (Senior Program Manager, PHFI) and Ms.Arunima Ghosal (Research Assistant, PHFI) who in spite of busy schedule has co-operated with me continuously and indeed, his valuable contribution and guidance have been certainly indispensable for my project work.

I am thankful to PHFI recruitment Team for giving me the opportunity to work with PHFI .

I would also like to thank and express my deep sense of gratitude to Mr. Col. Ashok Kaushik (Dean Academic & Student Affairs, IIHMR) and my faculty guide Mrs. Veena Nair Sarkar (Professor, IIHMR). I am greatly indebted to both of them for providing their valuable guidance at all stages of the study, their advice, constructive suggestions, positive and supportive attitude and continuous encouragement, without which it would have not been possible to complete the project..

I owe my wholehearted thanks and appreciation to the entire staff of the organization for their cooperation and assistance during the course of my project.

I hope that I can build upon the experience and knowledge that I have gained and make a valuable contribution towards this organization in coming future.

Aayushi Mishra (0522)

IIHMR University Jaipur, Rajasthan

To investigate performance of Madhya Pradesh in terms of Social health determinants of under nutrition in mother and children (under age five).

1. Introduction

Social health determinants are the factors which influence the health inequities in terms of 1) economic stability 2) Education 3) Social and community context 4) Health and health care services 5) neighborhood and built environment.

To improve social, health, economic and environmental aspects of every country Sustainable Development Goals (SDGs) were established after successful completion of the Millennium Development Goals (MDGs). The SDGs were articulated at the United Nations Conference on Sustainable Development in Rio de Janeiro in 2012 with the objective of setting 17 global goals pertaining to economic development, social justice and political emancipation. The objective of these goals were to forge global action against the most pertinent environmental, political and economic challenges of 21st century and for the world to reach a sustainable development growth path by 2030. Out of the 17 global SDGs, Goal 2 – Zero Hunger and Goal 3 – Good Health and Well Being contain goals pertaining to undernourishment and its health impacts. One of the key targets enshrined in Goal 2 is the elimination of hunger and all forms of malnutrition by 2030 and by 2025 achieve the internationally agreed standards of stunting and wasting in children under the age of 5 years. While Goal 3 sets out targets for reducing maternal mortality, child and neonatal mortality and integration of reproductive child health programs in national programs and achieving Universal Health Coverage (UHC). These are key inputs within the health system that directly or indirectly impacts undernutrition and its drivers.

For the world to achieve SDGs, India presents a key piece of the puzzle because of its high population and high population growth rate; high prevalence of poverty, in spite of high economic growth; and inadequate investments in basic public goods like health, education and food security. As per Global Hunger Index (GHI) 2018 out of 119 countries, India stands at 103 rank and scores 31.1 whereas its immediate neighboring countries like Sri Lanka and Bangladesh stands at 67 and 86 rank with a score of 17.9 and 26.1 respectively. The GHI calculates these scores by scoring performance of these countries on under 5 year child mortality, stunting, wasting and undernourishment. These are universal commitments that are meant for all countries. Moreover India has the highest prevalence of wasting i.e. 21% whereas other countries such as Sri Lanka has 15.1% children who are wasted, 38.4% children in India are stunted whereas Sri Lanka 17.3% children are stunted. Death is the most serious consequence of undernutrition. Under five mortality of India is 4.3% whereas in Sri Lanka it is 0.9%.

From overall global goal and targets, NITI Aayog (government institution aimed to achieve SDG) has selected 62 priority indicators by National indicator framework and computed SDG India index guide. Some nutrition sensitive and specific indicators are enumerated in the table below.

Table 1: Sustainable Development Goals and Targets Relevant for Tackling Undernutrition in India.

	Global target (2030)	India SDG index indicator	Current situation	Target 2030
No Poverty	Reduce at least by half the proportion of men, women and children of all ages living in poverty in all its dimensions according to national definitions	- Percentage of population living below National Poverty line. - Percentage of households with any usual member covered by any health scheme.	21.92% 28.7%	10.95% 100%
Zero hunger	End all forms of malnutrition, including achieving, by 2025, the internationally agreed targets on stunting and wasting in children under 5 years of age, and address the nutritional needs of adolescent girls, pregnant and lactating women and older persons.	- Children under age 5 years who are [`ted.(%) - Pregnant women aged 15-49 years who are anaemic (11.0g/dl)(%)	38..4% 50%	21.03% 23.57%
Good health and well being	By 2030, reduce the global maternal mortality ratio to less than 70 per 100,000 live births.	Maternal Mortality Ratio	130	70
	End preventable deaths of newborns and children under 5 years of age, with all countries aiming to reduce neonatal mortality to at least as low as 12 per 1,000 live births and under-5 mortality to at least as low as 25 per 1,000 live births.	- Under-five mortality rate per 1,000 live births - Children aged 12-23 months fully immunized.(%)	50 62%	11 100%
Water and sanitation	Achieve universal and equitable access to safe and affordable drinking water for all.	Population having safe and adequate drinking water in rural areas.(%)	71.8%	100%

Source- India SDG Index score report 2018

In India, states like Madhya Pradesh (MP), Jharkhand are the underperforming states in terms of achieving SDG. M.P is the state which did not achieve any SDG indicator yet, their score is below average in every SDG indicator. Moreover Madhya Pradesh stands at third rank in infant mortality rate. In term of no poverty (SDG-1) M.P scored 44 which is below national average (India -54) whereas its neighbor states like Chhattisgarh(50),Odisha (59) have better scores than M.P. In zero hunger M.P scored 41 which is below national average (India-48) whereas Maharashtra (47), Chhattisgarh (46) scored

marginally better than M.P. In terms of good health and well-being M.P scored 38 whereas national score is 52 and other neighboring states such as Maharashtra (60), Odisha (54) have better scores. In providing quality education India scored 52 and M.P scored 49 which is again less than national score and neighboring states such as Maharashtra (74). In terms of providing adequate and safe water M.P scored 63 which is same as the national score but states like Chhattisgarh (98) and Maharashtra (81) scored above national average. Out of 29 states M.P is generally seen to be underperforming in all nutrition related targets.

It is in this context, we would like to study the various socio-economic and health determinants of undernutrition in Madhya Pradesh and their variation across different socio-economic groups. We chose Madhya Pradesh, as the state still lags behind the national average in anthropometric measures of undernutrition and some of the key health determinants of undernutrition as have been discussed above.

2. Review of Literature: Underlying Factors Determining Nutritional Status in Children

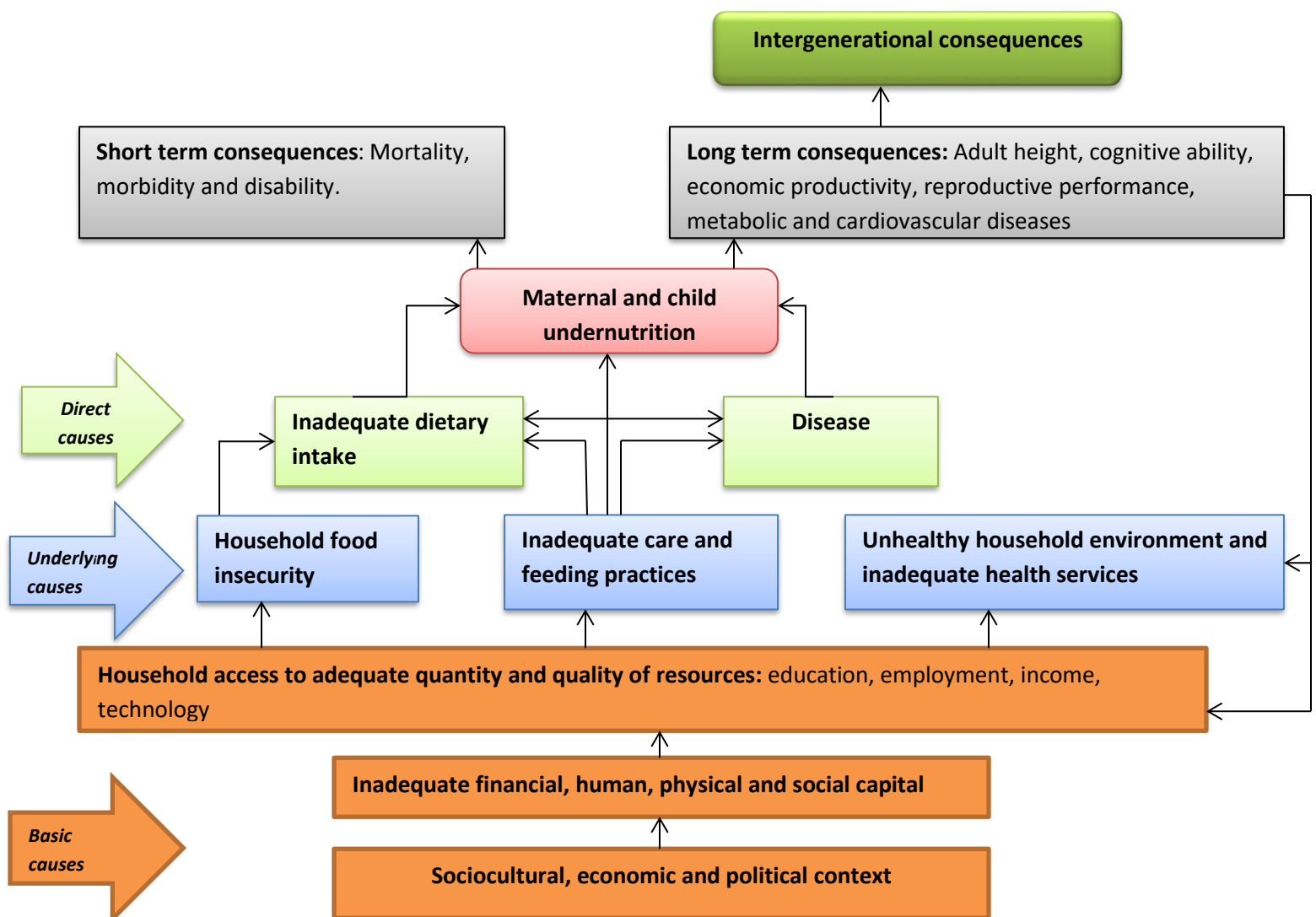
Various direct and indirect factors are there which influence the nutritional status of children. Factors such as age of mother at the time of birth play an important role in birth outcomes and child health. Teenage mothers are highly vulnerable to maternal mortality as they are weak physically, mostly have low pre pregnancy BMI, are prone inadequate intake of nutritious food especially in lower economic strata and if the mother is anemic then the chances of maternal mortality increases especially in case of severe anemia. These factors hinder the growth of child during the gestational period and results in underweight infant (highly vulnerable to diseases). If the girl is born underweight, she is more likely to be an adult woman with short stature in future. A study done by Fanciele Dinis Ribeiro (2014) shows that mother with age less than 20 years have higher infant mortality than other age groups because mothers whose menarche happened less than two years before pregnancy have higher risk of low birth weight and ultimately leads to neonatal death, non-adherence to pre-natal care, low BMI, physiological immaturity especially uterine. Later low BMI results in intrauterine growth restriction of infant which creates obstacle in the growth of child and leads to low birth weight of the child which causes under absorption of nutrients even after birth.

It is seen that teenage mothers are less aware of safe motherhood practices. Breastfeeding is also one of the important factor which influence the nutritional status of the child. Breastfeeding is very crucial for baby as well for the mother to as it protects both of them from certain diseases (mothers who breastfed their child have lower risk of breast and ovarian cancer). Moreover initiation of breastfeeding is also important factor, breastfeeding within one hour i.e. feeding colostrum which is very important for the child is rich in various protective factors. A study done by Rajesh Mishra (2017) in tribal areas of M.P found that maximum mothers feed colostrum to their child but very few of them were aware about the benefits of feeding colostrum. As per global statistics 3.5 million children's death caused by malnutrition and out of this 1.4 million of death were caused because infants were not exclusively breastfed. A study done by Roland Pongou et al (2013) justifies that boys have a higher infant mortality than girls as they are biologically weaker than girls and are more susceptible to disease and premature death.

A study done by Acharya (2018) found that level of utilization of ANC measured by number of ANC visits, consumption of recommended dose of IFA tablets and deworming tablets were significantly

associated with low birth weight. Infants who have low birth at birth are more likely to be stunted. A study done by Ni Ketut Aryastami et al.(2017) justified significant relationship between low birth weight and stunting .It is also found that neonates with past illness history such as diarrhea, acute respiratory infection also may have hindered growth.

Fig-1-UNICEF framework on Child undernutrition



UNICEF framework for undernutrition has recognized the factors responsible for undernutrition. These factors are divided at different levels and linked with each other. In case of tribal community of Madhya Pradesh Household food insecurity, inadequate feeding practices(low intake of nutritious diet) and

inadequate health services are the most influencing factors in case of tribal. Tapas Chakma *et al.* (2014) in his study in Madhya Pradesh found that consumption of nutrient rich diet is very low in tribals and for their health problems they prefer herbal medicines rather than going to government facility.

According to a report on Improving Nutrition by Multi-sectoral Approach (2013), cause of malnutrition is a complex problem and is scattered at three different level i.e. basic, underlying and immediate causes. The immediate cause is linked with food and nutrient intake and its effect on health. The basic causes lie in institutional, economic and political issues such as reduction in poverty, economic growth, role of private sector whereas underlying causes are rooted in household and community such as gender issued, girl education, lack of accessibility to health services, climate change etc. In this paper we are studying the performance of the state MP on some of the most pertinent immediate and underlying factors that affect levels of undernutrition. We will also assess the alignment of government district wise spending in key nutrition and health related programs with respect to key nutrition outcomes of the target population at the district level.

Table 2: Review of Literature on Madhya Pradesh and some of its Neighboring States.

S.No.	Author (Year)	Study Location	Sample size	S.T	Salient Feature
1.	Rajesh Mishra February 4,2017	Madhya Pradesh- 1) Alirajpur 2) Barwani 3) Khandwa	294 women with their last child in the age-group of six months–five years.		1) Although the Infant and Young child feeding practices such as feeding of colostrum and early initiation of breastfeeding have improved but continuation of breastfeeding up to two years and feeding of supplementary food are still the weaker sections, these two problems are associated with the fact that many tribal females are daily wage laborers. 2) There is very less difference in the malnutrition level between the children who are taking supplementary food from AWC and children are who are not taking food from AWC 3) Early marriage, low BMI, lack of education, poor quality of NRC are the areas where urgent attention is needed
2.	Vishwambhar Prasad Sati March 6,2016	Shivpuri district of Madhya pradesh			1) Sahariya tribal are the landless laborers of Shivpuri district who are generally daily wage agriculture laborer or stone miners. They mainly suffer from acute respiratory disease like asthma as most of them are working in stone mines and malnutrition. 2) For their health they prefer traditional

					herbal medicines rather than going to government facility due to their geographical isolation. 3) As they are not stable it is difficult to make policies for them. 4) Sahariya tribal development authority is working to enhance their socio economic movement by providing financial assistance, preventing their seasonal movement by providing them land and improving infrastructural facilities.
3.	Tapas Chakma <i>et al.</i> July3,2014	Madhya Pradesh- 1) Bastar 2) Mandla 3) Chindwara 4) Morena Chattisgarh- 1)Surguja 2)Raigarh	7 primitive tribes- Ambujhmaria. baiga,saharia, kamar,bharia, bhiror,korwa.		1) Consumption depends on availability and their purchasing power. In tribal areas they consume cereal based diet, although the consumption of protein, oil, fat and other micronutrient is low, the tribal people looks healthy because of the consumption of the available food like red ant, monkey with unknown nutrient value . 2) Prevalence of Acute respiratory disease, diarrhea and tuberculosis is very high in most of the districts.
4.	Statistical profile of scheduled tribes in India 2013, NFHS-4 2015-16	Madhya Pradesh			1) Mother and child are the vulnerable groups which need urgent attention. Out of total pregnant mothers only 7% mothers had taken full ANC checkup. 2)AWC plays a very important role in improving the nutritional status of mother and child but coverage of AWC in tribal areas is very low such as- a)59.7% children are weighed in AWC and counseling of mothers after their child was weighed is 57% which shows the improper functioning of AWC. b) Vaccination coverage in tribal communities i.e. 52%. c) Due to irregular supply and poor quality of food in AWC by SHG,62% of the children have access to supplementary food provided by the AWC. d) Education is the important factor to improve the nutritional outcomes, 46.7%mothers received health and

					nutrition education.
5.	Suparna Ghosh-Jerath et al.,2013	Madhya Pradesh-Shivpuri,Sheopur and Guna	575 households with 750 females of reproductive age (15-49yrs) and 630 under 5 children (318 male and 312 female).	Probability proportional to size sampling	1)This study aims aimed to explore operational planning for a village level wheat flour fortification program with iron and folic acid (IFA) targeted toward this tribal community of M.P. 2)Due to different linguistic, cultural and geographical environment as most of the sahariya tribal migrates at the time if 'chait' and 'baisakh' 3) Nutrition education, strengthening the system and community empowerment, participation plays a key role in overall development of the tribal community. Lack of awareness and quality leads to underutilization of the healthcare services.
6.	S. Vellaichamy et al.,2018	Dhar and Datia districts of Madhya Pradesh.	120 respondents- a)60 adults(30male and 30 female) b)60 school children(30 male and 30 female)	Multistage sampling	1) Dietary diversity is closely associated with the adequate nutrition and act as a food security indicator as well as the choice of food depends upon the availability and food habits influenced by the tradition, beliefs of the community. 2)The pattern of dietary pattern is calculated by Individual Diet Diversity Score(IDDS) ranging from 0-7.The IDDS was higher in males than females i.e. the intake of cereals, pulse, vegetables, milk and milk products was less than RDA in girl child.
7.	Akanchha Pandey et al., 2017	Dhar district of Madhya Pradesh.	200 respondents- 100 working tribal people and 100 non-working tribal people	Stratified cluster sampling	1) Under-utilization of public health services as they have their own system of diagnosis and cure. Low level of literacy and socio economic status coupled with blind faith in cultural belief leads to serious public health issues. 2)The wide spread poverty, malnutrition, absence of safe drinking water and sanitary conditions, poor materials and child health services, ineffective coverage of national health and nutritional services, etc. are the major contributing factors for dismal health in tribal community of Dhar.
8.	Latha Srikanth et al.,2017	Mandla district of Madhya pradesh	522 repondents		Tradition beliefs plays a key role in feeding practices. Newborn feeding practices of tribal communities is of paramount importance

					in planning culturally sensitive child health programs.
9.	Arvind Sharma et al.,2015	Nainpur block of Mandla district in Madhya Pradesh	210 mother-infant pairs who delivered in last one year	30 cluster sampling method	1) Early initiation(within 1hour) of breastfeeding is the easiest, cost effective and life-saving interventions for the health of the newborn. 2)Mother and father education, counseling during ante natal and post natal care and place of delivery are the important factors associated with the early initiation of breastfeeding.
10.	Rajesh Mishra,2016	Chhattisgarh			1)Tribals lives in isolated areas with extreme poverty with poor outreach to welfare programs provided by the government or other health institutions. 2) Many tribals like korwa who lives in isolated are totally dependent on forest products. 3) Women are highly susceptible to malnutrition They do not consume any special food during pregnancy which leads to micronutrients deficiency which results in high risk of adverse pregnancy outcomes. During their pregnancy they do all their routine work including heavy activities such as carrying wood from forest on their head till labour pain starts. and conduct unsafe practices during delivery such as cutting umbilical cord with knife which can cause infection to the infant. 4)After delivery their took their child to worksite to continue their work and to feed their child as well.
11.	Vani Sethi et al.,2017	1)Chattisgarh-Bastar 2)Odisha-Koraput 3)Jharkhand-West Singhbhum			1)Community involvement in health and nutrition intervention.is very important in delivering services to the people living in isolated areas. 2) To enhance the level of awareness about nutrition, women centric approach i.e. encouraging women participation in community activities such as SHG, nutrition sensitive and specific interventions should be used

3. Research Question and Objectives

The key research question therefore, in the above context, is to investigate the performance of Madhya Pradesh across some of these key determinants of under-nutrition that has been globally identified as key to addressing this scourge. Accordingly, it is also essential to assess the response of the state government of Madhya Pradesh (MP) to some of these challenges

- What is the variation in health determinants amongst different caste in M.P which influence nutritional status of mother and child?
- What are government programs that address some of these health determinants and how do they perform in terms of budget allocation?

3.1 Objective

Objective-1

- To understand the variation in health determinants amongst different caste in M.P which influence nutritional status of mother and child.

Objective-2

- To establish the correlation between government program spending at the district level and the outcome indicators (prevalence of stunting).

3.2 Material and Method

For Objective - 1

Research Design - Observational Descriptive study on secondary data

- 1) NFHS-4 2015-16
- 2) Annual Health survey 2013-14

Research procedure – Desk review of secondary data was done to understand the cast variation in health determinant.

Study Setting - The study is conducted in 52 districts of Madhya Pradesh.

For objective -2

Research Design- Observational descriptive study on expenditure on ICDS and their associated programs.

NHM Madhya Pradesh districtwise report on maternal and child expenditure.

Research procedure- Using spearman rank correlation, we have tried to see the strength of correlation between the expenditure and prevalence of stunting.

Statistical method used- SPSS (Spearman rank correlation)

Study setting- The study conducted in all districts (52) of Madhya Pradesh.

Study Area- Madhya Pradesh, India.

1. Review of Statistical Evidence on Health and Nutrition status of communities in Madhya Pradesh.

4.1 Status of Undernutrition

Schedule tribes has the highest number of undernourished children in terms of stunting (48.2%), wasting (30.2) and underweight (51.5). These figures reflect the low intake of nutritious diet among schedule tribes which later leads to recurrent infection, chronic or acute diseases which cause poor nutrient intake, absorption or utilization. Undernutrition creates a trap for other diseases such as diarrhea, acute respiratory infection. Other backwards class has 39.7% children who are stunted which reflect that better availability and diversity of food than schedule caste and tribe. A study done by Rajesh Mishra in Madhya Pradesh found that in tribal areas mothers feed colostrum to the child but very few have the knowledge about the benefits of feeding colostrum as well as very few mothers breastfed their child within one hour of the delivery and continue it to two years.

Table-1: Nutritional status of children

	Stunted (%)	Wasted (%)	Under weight (%)
Schedule caste	47.6	25.5	45.9
Schedule tribe	48.2	30.2	51.5
Other backward class	39.7	24.9	40.73
others	31.6	21.5	30.6

*Source-NFHS-4 report

Note-Table is based on the number of children surveyed.

Wasting is short term effect of inadequate consumption of food and recurrent infection and disease. 30.2% children from schedule tribe are wasted whereas schedule caste and other backward class has lower number of children who are wasted i.e. 25.5% and 24.9%. Children from schedule tribe has the highest number children number underweight i.e. 51.5% children than other categories.

Table-2: Anaemia in children

	Mild (10.0-10.9 g/dl)(%)	Moderate (7.0-9.9 g/dl)(%)	Severe (<7.0 g/dl)(%)	Any anemia (<11.0 g/dl)(%)
Male	28.4	38.4	2.2	69.1
Female	30.4	36.7	1.7	68.8
Schedule caste	29.9	37.4	2	69.3
Schedule tribe	30.9	42.8	2.4	76.1
Other backward class	28.9	37.5	1.9	65.9
others	29.4	34.5	1.4	65.2

*Source-NFHS-4 report

Note-Table is based on the number of children surveyed

Anemia is one of the contributing factor malnutrition among children. Schedule tribe has the highest number of children who have mild anemia i.e. 30.9% and 42.8% children were having moderate anemia. Out of total number of children surveyed 2.4% children were having severe anemia. Pandey et al (2017) has shown that the prevalence of anaemia in children is high in tribal dominated districts of Madhya Pradesh .Moreover according to her study there is a positive relation between anemia and hookworm infection due to lack of health awareness, bare foot etc.

1.2 Factors Determining the status of Undernutrition in the State

1.2.1 Safe Motherhood

As per NFHS-4 (2015-16) report, Madhya Pradesh stands at third position in infant mortality rate i.e. 51.2% and second in under five mortality i.e. 64.6% in the country. Various factors are associated with high MMR and IMR such as mother's age at pregnancy. Mothers with age less than 20 have higher infant mortality i.e.72.4% than other age group(age group 20-29 –IMR 47%) and it is justified by the study done by Fanciele Dinis Ribeiro (2014) which states that mothers whose menarche happened in less than two years before pregnancy have higher risk of neonatal death.Non adherence to pre-natal care, low BMI ,physiological immaturity especially in uterine, that leads to intrauterine growth restriction which results in low birth weight and prematurity of the child

Mother's age at marriage and during pregnancy has been found to be a significant factor in influencing infant mortality and under-five mortality. Ribeiro (2014), as has been discussed before, found that mothers whose menarche happened less than two years before pregnancy are at higher risk of neo-natal death, non-adherence to pre-natal care, low BMI, and physiological immaturity of uterine, that leads to intrauterine growth restriction, low birth weight and prematurity. From Table 1 we can see that both infant mortality and under-5 mortality rates are significantly higher for mothers under age 20 years. The table also suggests that this also very high for scheduled tribes (STs) and scheduled castes (SCs) in the state compared to the general castes. The statistics indicate that marginalized communities are more vulnerable than other classes in terms of child health outcome indicators.

Table-3

	Infant mortality rate (%)	Under five mortality rate (%)
Mother's age at marriage		
<20	72.4	87.5
20-29	47.4	59.8
30-39	46.8	64.6
Sex of child		
Male child	55.5	68.8
Female child	46.9	60.6
Categories		
Schedule caste	54.3	69.6
Schedule tribes	58.9	78.5
Other backward class	51.7	62.6
Others	34.6	42.8

2. *Source- NFHS-4 report

3. Note- Table is based on the number of children surveyed and who stayed in the household the night before the interview.

Infant mortality rate of boys is 55.5% whereas girl have 46% infant mortality rate. Under 5 mortality rate is also high in boys i.e. 68.8% whereas in girls under 5 mortality is 60.6%. A study done by Roland Pongou et al (2013) justified that boys have a higher infant mortality than girls as they are biologically weaker than girls and are more susceptible to disease and premature death.

A study done by kupuddi subba rao et al.(2017) justifies that teenage pregnancy is associated with high risk of pregnancy-induced hypertension, eclampsia, premature onset of labor and fetal deaths. Teenage pregnancies are at high risk of restricted intra uterine growth which hinders infant's growth during gestation. A study done by Deepak sharma et al.(2016) found that various maternal factors such as age of the mother, inter-pregnancy interval (less than 6 months or 120 months or more), maternal health, and maternal infection affect the growth of the fetus and are responsible for causing intra uterine growth restriction(IUGR). Any mismatch between the supply of nutrient by the placenta and the demand of the fetus also leads to IUGR.

As per Special bulletin on MMR by SRS (2018), Madhya Pradesh comes under top five states having highest MMR in India. MMR of Madhya Pradesh is 173 whereas India's MMR is 130. In context of age, age group 25-29 has highest maternal deaths whereas females with age 45-49yrs has the lowest number of maternal deaths. A study done by Montgomery et al (2014)¹ have shown that majority of maternal deaths are caused by direct obstetric reasons like hemorrhage, sepsis, hypertensive disorders, and other complications. The deaths are however more concentrated in rural areas and are attributed to low availability and uptake of services. The study also found that most of the maternal death occur during intrapartum period due to obstetric hemorrhage. In some cases the cause of maternal death was not direct such as hypertensive disorder, obstructive labour, anaesthetic complications during obstetric surgery also results in maternal deaths.

Mothers with no formal education has higher under 5 mortality rate^[2] especially in age group less than 20 and 30-39 due to lack of unsafe motherhood practices, access to diarrhea and pneumonia treatment, measles and tetanus vaccination, lack of financial stability as a result they are unable to buy nutritious food for their children which leads to low level nutrition among children, lack of awareness about the government facility and vaccination, poor health seeking behavior results in under five mortality. Under five mortality in mother's age less than 20yrs is 87.9% and in mother's age 30-39yrs is 64.6%.

Table-4: Place of delivery and Postnatal care

	Births delivered in health facility (%)	Women with postnatal checkup (%)	Women with post-natal checkup within 2 days (%)
Schedule caste	84.8	60	57.8
Schedule tribe	60.3	50.6	45.9
Other backward class	87.4	63.1	60

¹ Montgomery, A.L., Ram, U., Kumar, R., Jha, P. and The Million Death Study Collaborators (2014), Maternal Mortality in India: Causes and Healthcare Service Use Based on a Nationally Representative Survey, PLoS One. 2014; 9(1): e83331; doi: 10.1371/journal.pone.0083331

Others	90.6	66.5	63.7
--------	------	------	------

*Source-NFHS-4 report

Note-Table is based on the number of children surveyed.

Adequate antenatal care reduces the risk of IUGR by regular fetal growth monitoring by USG and plotting on customized growth chart early detection of IUGR, delivery at appropriate time and place having appropriate neonatal facilities with well trained staff. Although adequate antenatal care reduces the risk of adverse pregnancy outcome even then only 7% pregnant mothers visit full ANC visits. Institutional deliveries are very important for safe delivery and to reduce the risk of complications that may cause death or illness to mother and child. Schedule tribes have the lowest number of institutional births i.e 60.3%. A study by Eshetu E Chaka et al (2019) shows that neonatal mortality rate is lower in those pregnancies who delivered in health facility whereas in other categories such as schedule caste and other backward caste the number of institutional birth is quite higher than schedule tribe which is 84.8% and 87.4% respectively.

Only 50.6% mothers of schedule tribe went for post-natal checkup this shows their poor health seeking behavior and out of these mothers 45.9% went within 2 days whereas 60% mothers belonging to schedule caste went for post-natal care and out of this 57.8% mothers went within 2 days. Role of education, especially of female education in tribal area, is important contributing factor associated with utilization of postnatal care. Female education is related with enhancing the economic status of mothers, female empowerment, awareness of mother, and independent decisions making capacity in them.^[3]

Table 5: Body mass index

	<18.5 (total thin) (%)	<17.0 (moderately/ Severely thin) (%)	≥25.0 (overweight or obese) (%)	≥30.0(obese) (%)
Schedule caste	30.5	12.8	10.4	1.9
Schedule tribe	34.4	13.6	5.9	1
Other backward class	28.1	11.4	13.9	3.1
others	20.2	8.3	24.5	6.6

*Source-NFHS-4 report

Note-Table is based on the number of children surveyed.

Body mass index of the females influences infant's growth. 34% mothers of S.T are thin and 13.6% are severely thin,30.5% S.C females thin and 12.8% are severely thin this shows the scarcity of food which results in their low BMI and affects child's growth. A study done by Thakre S.B et al.(2018) found that mothers with short stature are at higher risk of having underweight child. Low BMI hinders the growth of the child which later results into intra uterine growth restriction. Fetal malformations, inborn error of metabolism, and chromosomal abnormalities are responsible for IUGR in a few cases.

Table-6: Anemia in pregnant and breast feeding mother

	Mild (%) (10.0-11.9 g/dl)	Moderate (%) (7.0-9.9 g/dl)	Severe (%) (<7.0g/dl)	Any anemia (%) (<12.0g/dl)
Pregnant females	25.5	27.5	1.7	54.6
Breastfeeding mothers	43.9	13.6	0.9	58.4

*Source-NFHS-4 report

Note-Table is based on the number of females surveyed.

Anemia is one of the major factor which contributes to degrade the level of nutrition in females. A study done by Thakre S.B et al.(2018) found that maximum percentage of low birth babies were found in those mother who had severe anemia. In context to caste, schedule tribe has the highest level of severe anemia i.e. 2.4% which means they are at high risk of adverse pregnancy outcomes .Anemia during pregnancy is especially a concern because it is associated with low birth weight, premature birth and maternal mortality. Women who are pregnant are at a higher risk for developing anemia due to the excess amount of blood the body produces to help provide nutrients for the baby.25.5% females have mild anemia and 27.5% females have moderate anemia.

Postpartum anemia is highest in mothers who are anemic during pregnancy. Furthermore, lactating mothers are highly susceptible to iron depletion if the energy and nutrient intake in their diets is inadequate. Blood lose is also one of the reason that lactating mothers are more susceptible to anemia.43.9% lactating mothers have mild anemia whereas 13.6% mothers have mild anemia.

4.2.2 Infant and Young Child Feeding (IYCF)

IYCF is a strategy established by WHO and UNICEF jointly. It aims to improve the nutritional status of children under age three by improving and promoting optimal infant and young child feeding practices.

Table-7: Initial breastfeeding

	Children ever breastfed (%)	Breastfed within one hour of birth (%)	Breastfed within one day of birth (%)	Children received a pre lacteal feed (%)
Schedule caste	95.9	36.1	86	10.9
Schedule tribe	95.7	32.4	84.2	11
Other backward class	96.2	35.2	84.4	12.8
others	94.2	34.5	80.3	15.6

*Source-NFHS-4 report

Note-Table is based on the number of children surveyed.

Initiation of breastfeeding is one of the important contributing factor which influence child's growth.

The guidelines of IYCF suggest that initiation of breastfeeding within an hour of the child's birth, Breastfeeding in the first hour also confers benefits to the mother, such as improved lactation and less loss of blood.32.4% tribal females breastfed within one hour of the birth whereas in schedule caste 36.7% females breastfed their child within one hour of the birth.

Maximum mothers in all the categories breastfed within one of the birth i.e. 84.2% tribal mothers breastfed within one day.

This shows that, there is a need to further strengthen the IYCF practices by propagating the importance of an early initiation of breastfeeding among mothers of the tribal areas.

Table-8: Duration of Breastfeeding and Diet

	Median duration (months) of breastfeeding among last-born children born in the last three years⁽¹⁾.	Among breastfed children 6-23 months, percentage fed

	Any Breastfeeding (months)	Exclusive Breastfeeding (months)	Predominant Breastfeeding⁽²⁾ (months)	4+ food Groups⁽³⁾ (%)	Minimum meal frequency⁽⁴⁾ (%)	Both 4+ food Groups and Minimum meal frequency (%)
Schedule caste	31.3	3.6	7.2	15.2	32.8	7.7
Schedule tribe	33.9	3.6	6.9	13.2	35	6.1
Other backward class	30.2	3.1	6.8	14.9	32.2	6.5
others	26.2	2.7	6	16.5	35.8	8.4

*Source-NFHS-4 report

Note-Table is based on the number of children surveyed.

(1)-Median duration are based on the distributions at the time of the survey of the proportion of births by months since birth. Includes children living and deceased at the time of the survey. It is assumed that children not currently living with the mother are not currently breastfeeding.

(2)- Either exclusively breastfed or received breast milk and plain water and/or non-milk liquids only

(3)-Food groups are: a. infant formula, milk other than breast milk, cheese or yogurt or other milk products; b. foods made from grains or roots, including porridge or gruel, fortified baby food; c. vitamin A-rich fruits and vegetables; d. other fruits and vegetables; e. eggs; f. meat, poultry, fish, shellfish, or organ meats; g. beans, peas, lentils, or nuts; h. foods made with oil, fat, *ghee*, or butter

(4)-Receiving solid or semi-solid food at least twice a day for breastfed infants 6-8 months and at least three times a day for breastfed children 9-23 months.

A minimum acceptable diet is essential to ensure appropriate growth and development of infants and young children. Without adequate diversity and meal frequency, infants and young children are vulnerable to malnutrition. Tribal children receives exclusive breastfeeding for 3.6 months but ideally it should be atleast for 6 months. Tribal mothers are generally daily wage laborers due to which it is not possible for them to feed their child for a longer period whereas children of other categories receives exclusive breastfeeding for 2.7months..Availability of various food items is very less in case of tribal communities. Only 13.2% children gets 4+ food groups i.e availability of nutritious food other than milk in a household for the baby.

Among breastfed children 6-23 months 13.2% children of schedule tribes received 4+ food groups whereas 15.2% children of schedule caste receives 4+ food group. 6.1% children of S.T receives both 4+ food groups and minimum meal frequency. This shows that the schedule caste and others have better availability and diversity of food than S.T. Malnutrition results in terms of stunting, wasting and underweight. These three indicators reflect the scarcity of energy and protein rich diet.

Table-9: Non breastfed children

	Among non-breastfed children 6-23 months, percentage fed:			
	Milk or milk products⁽⁵⁾ (%)	4+ food Groups⁽³⁾ (%)	Minimum meal frequency (%)	With 3 IYCF Practices⁽⁶⁾ (%)
Schedule caste	49.5	23.1	50.5	4.7
Schedule tribe	36.2	23.4	43.8	7.2
Other backward class	51.7	20.1	51.2	3.5
others	54.2	23	57.4	5.8

*Source-NFHS-4 report

Note-Table is based on the number of children surveyed.

(5)-Includes two or more feedings of commercial infant formula, fresh, tinned and powdered animal milk, and yogurt

(6)-Non-breastfed children age 6-23 months are considered to be fed with a minimum standard of three Infant and Young Child Feeding Practices if they receive other milk or milk products at least twice a day, receive the minimum meal frequency, and receive solid or semi-solid foods from at least four food groups not including the milk or milk products food group

Children who are not breastfed are more susceptible to malnutrition. Among schedule tribe 36.2% children receives milk or milk product and 23.4% receives 4+ food groups, this shows the availability and diversity of food they have. 3.5% children of other backward class receive the minimum meal frequency and receive solid or semi-solid foods from at least four food groups, whereas 7.25 children of tribes receives minimum standard of three IYCF practices.

4.2.3 Prevalence of diseases and infections in children

Undernutrition creates a trap for the diseases and infections. Acute respiratory infections, diarrhea act as a opportunistic infection if the child is under nourished. Prevalence of diarrhea is highest among schedule caste, and others i.e. 9.9% and 10.1% respectively and out of these, 69.9% and 69.8% children were taken to health facility or health provider this reflects poor water and sanitation facility, poor health seeking behavior and low level of awareness, whereas in schedule tribe 8.9% children were having diarrhea and 63% children were taken to health facility or health provider.

Table-10: Prevalence of Diarrhea and its treatment

	Children with diarrhea in last two weeks preceding the survey (%)	Children with diarrhea taken to a health facility or health provider.(%)	Children who were given either ORS or gruel.(%)	Children given Zinc supplements (%)
Schedule caste	9.9	69.6	62.1	28.9
Schedule tribe	8.9	63	59.8	23.8
Other backward class	9.5	69.9	60.3	27.7
Others	10.1	69.8	63.3	24.9

*Source-NFHS-4 report

Note-Table is based on the number of children surveyed.

A study by Sharma et al.(2014) found that the prevalence of ARI is higher in those children who are under nourished especially if the child is under weight. Prevalence of acute respiratory infection is high in schedule caste and tribe which is 2.8% and 2.1% out of this number of children with ARI symptom taken to health facility is 72% and 64.3%. This shows the status of children in tribal communities and how much susceptible to infections. Prevalence of diarrhea and acute respiratory infection is quite less in schedule tribes in comparison to other caste categories. Prevalence of diarrhea in last two weeks of the survey was 8.9%. Various factors could be responsible for this such as better water and sanitation facilities, due to poor health seeking behavior they are not aware about the disease because out of total number of children suffering from diarrhea 63% children were taken to health facility and 23% children were given zinc supplements, use of traditional medicine such as acacia nelotica to cure diarrhea and ARI, climatic conditions. Some districts where 50% population is tribal such as Jhabua (4.7), Seoni (6.4) has less number of diarrheal cases which results overall decline in the prevalence of diarrhoea in schedule tribe of

overall Madhya Pradesh. There is a need for decentralized planning as various tribal communities have different societal, economic and cultural issues.

Table-11: Prevalence of Acute respiratory infection in under 5 children

	Children under 5 with symptoms of ARI(%)	Children with symptoms of ARI got treatment from a health facility or provider(%)	Children with fever(%)	Children with fever got treatment from a health facility or provider(%)
Schedule caste	2.8	72.4	11.6	71.9
Schedule tribe	2.1	64.3	10.5	63
Other backward class	2.0	76.1	11.6	76.2
others	1.9	76.7	11.7	69.7

*Source-NFHS-4 report

Note-Table is based on the number of children surveyed.

In ‘others category’ the number of children with fever is highest i.e. 11.7% whereas tribes have lowest level of children with fever i.e. 10.5% but out this only 63% children were taken to health facility.

Chakma et al.(2017) shows that in case tribal community, they have their own system of diagnosis and cure as well as due to their geographical isolation they are unable to access health facilities.

Utilization of Services

To tackle the problem of malnutrition and health related complication the Government of India along with state governments have launched the Integrated Child Development Services (ICDS) Program. It provides supplementary food for pregnant and lactating mothers as take home ration and hot cooked meal for children in the age group of 0-6 years. The scheme also provides counselling to adolescent girls and early childhood learning interventions to children who attend the Anganwadi Centres (AWC). Among schedule caste, tribe and other backward class, 71% schedule tribes mother have access to supplementary food this could be because of geographical isolation because schedule caste and OBC live within or near to the general community due to which they easily access the AWC facilities.

Table-12: Utilization of ICDS services during pregnancy and lactation period.

	Mother received from an AWC during pregnancy			Mother received from an AWC during lactation period		
	Supplementary food (%)	Health checkups (%)	Health and nutrition education (%)	Supplementary food (%)	Health checkups(%)	Health and nutrition education (%)
Schedule caste	73.1	65.5	57.6	68.3	57.4	52.4
Schedule tribe	71	61.5	52.6	66.4	52.8	46.7
Other backward	72.3	63.9	55.9	67.5	55.5	50.3

class						
others	56.4	50.9	45.1	53.3	45	41.2

*Source-NFHS-4 report

Note-Table is based on the number of children surveyed.

61% tribal pregnant mothers prefer AWC for health check-up. A study by Vishvambhar Prasad et al (2016) found most of the tribals are forest dwellers due to which they have good knowledge of herbal medicine that as maximum of them are forest dwellers due to which they have good knowledge of herbal medicines as well as they have their own system of diagnosis and cure. Moreover, due to lack of trained staff they do not prefer.

During lactation period 66.4% mothers received food from AWC and 52.8% tribal mothers received health checkup. To upgrade the knowledge of tribal and other groups health and nutrition education is very important but only 46.4% tribal lactating females get knowledge about health and nutrition from AWC.

After pregnancy there is a sudden decline in the number of females who access AWC facilities during their lactation period. This decline is seen across all socio-economic classes.

Table-13: ANC visits and IFA consumption

	Mothers who had ANC visit in the first trimester of pregnancy (%)	Mothers who had full ANC visits (%)	Mothers who were given or bought IFA (%)	Mothers who take IFA for at least 100days (%)
Schedule caste	53.3	9.5	83.5	20.5
Schedule tribe	40.1	7.0	79.5	19.5
Other backward class	56.6	12.5	84.1	24.6
Others	62.1	17.3	84.9	30.3

*Source-NFHS-4 report

Note-Table is based on the number of mothers surveyed.

Ante natal checkups and Iron folic acid consumption is very crucial for pregnant females. It provides necessary care to the mother and helps identify any complications of pregnancy such as anemia, pre-eclampsia and hypertension etc. in the mother and slow/inadequate growth of the fetus. Table-2 depicts that schedule tribe has the least number of mothers who had visit ANC in the first trimester i.e. 40.1% this shows the level of awareness and their ability to access health facility whereas schedule caste and other backward class has higher ANC visits than schedule tribe which is 53.3% and 56.6%. ANC visit during first trimester in other categories is highest i.e. 62.1%.

Antenatal care helps in early diagnosis of high risk pregnancies, counseling of mother for the safe delivery, nutritious diet and consumption of IFA tablets to reduce the risk of severe anemia. Only 7% mothers in schedule tribes had full ANC visits whereas mothers belong to schedule caste and other backward class has higher percentage of full ANC checkup i.e 9.5% and 12.5%. Other categories has the highest rate of full ANC checkup which is 17.3%. Pregnant females are at higher risk of developing anemia during pregnancy. If the mother is anemic then the child will not get enough nutrient for his/her development which will lead to low birth weight of the child (American association of pregnancy). A study by Archana Patel et al. (2019) in Maharashtra found that anemia and underweight mothers are at higher risk of having still birth or LBW of

the infant. IFA tablet consumption helps in reducing the risk of anemia during pregnancy. Education plays a vital role in IFA consumption. Educated women are more likely to adhere to recommended dose of iron supplements. Mother of schedule tribe origin has the lowest rate of IFA consumption which is 79.5% and only 19.5% mother consumed IFA consumption for 100days, whereas in other 84.9% mothers consumed or taken IFA and 30.3% continued it for 100 days. Arvind Kumar Sharma et al.(2016) in Rajasthan that stunting is positively associated with birth weight, birth order, ANC visit at health care facilities, birth interval and family size. Mothers who had full ANC care prefer institutional delivery rather than home delivery even then only 7% schedule tribe mothers had full ANC checkups and 60.7% delivered in health facility.

Relationship between program expenditure and under five stunting.

Section-1

M.P districts (including tribal and non tribal)

Table-1

		Only ICDS	Total ICDS	Mangal Diwas	Atal health mission	Teenager empowerment	Minimum need health prog.	Total expenditure on nutrition program
Spearman rho	Number of stunted children	0.328 (0.020)	0.292 (0.04)	0.147 (0.132)	-0.063 (0.666)	-0.225 (0.116)	0.406 (0.003)	0.326 (0.021)
Kendall's tau	Number of stunted children	0.213 (0.029)	0.189 (0.053)	0.220 (0.124)	-0.042 (0.670)	-0.176 (0.095)	0.267 (0.006)	0.226 (0.021)

ICDS aims to improve the nutritional status of mother and child by providing supplementary food, counseling to the mother, birth registration, tracking of underweight children etc. Table -1 shows that only ICDS has significant relationship with stunting which means that expenditure is high on ICDS program in those districts which high prevalence of under five stunting. Higher the stunting higher will be the expenditure on the nutrition related programs to reduce the number malnutrition cases. Programmes such as minimum need program which aims to minimum quantity of calorie and protein in the form of supplementary food to mother and child.

Programmes such as Mangal diwas, Atal health mission, Teenager empowerment, these programs do not have significant relationship between program expenditure and under five stunting which means that districts which have higher number of stunting are not getting sufficient funds.

Section -2

Relationship between program expenditure and under five stunting in Tribal districts of Madhya Pradesh.

Table -2

		Only ICDS	Total ICDS	Mangal Diwas	Atal health mission	Teenager empowerment	Minimum need health prog.	Total expenditure on nutrition program
Spearman rho	Under five stunting	0.139 (0.548)	0.077 (0.741)	0.139 (0.548)	-0.057 (0.806)	0.224 (0.329)	0.490 (0.024)	0.222 (0.333)
Kendall's tau	Under five stunting	0.081 (0.0608)	0.043 (0.786)	0.081 (0.608)	-0.043 (0.786)	0.180 (0.293)	0.358 (0.023)	0.148 (0.349)

Table-2 includes only tribal districts whose population is higher than the state's average. The table shows that all the programs (except minimum need health program) do have significant relation between expenditure and stunting which means allocation of the budget is not according to the prevalence of stunting in the districts. This shows the status of programs going on tribals dominated districts.

Section-3

Relationship between program expenditure and under five stunting in non-tribal districts of Madhya Pradesh

Table-3

		Only ICDS	Total ICDS	Mangal Diwas	Atal health mission	Teenager empowerment	Minimum need health prog.	Total expenditure on nutrition program
Spearman rho	Under five stunting	0.384 (0.04)	0.352 (0.061)	0.197 (0.133)	0.114 (0.557)	-0.304 (0.031)	0.401 (0.031)	0.256 (0.051)
Kendall's tau	Under five stunting	0.246 (0.061)	0.241 (0.066)	0.281 (0.132)	0.069 (0.599)	-0.393 (0.035)	0.296 (0.024)	0.361 (0.054)

Table-3 contains non tribals districts (where the % of tribals is less than state's average).The table shows that Teenager empowerment program and minimum need health program are the programs who have significant relation ship between expenditutre and stunting i.e. higher the stunting higher the expenditure on the programs in that district .Total ICDS (Includes expenditure on ICDS, strengthening of ICDS,pay of AWW, mangal diwas), Mangal diwas,Atal health mission and total expenditure does not have significant relation between stunting and expenditutre.Ideallly there should be significant relation between these two variable i.e districts which have high prevalence of stunting should get more budget.

NHM

Section-1

General(all districts of Madhya Pradesh)

Variation in acheived health budget.

Table-1

		Maternal health achieved budget	Child health achieved budget	Grand total
Spearman rho	Number of under five stunted children	0.284 (0.046)	0.467 (0.002)	0.229 (0.001)
Kendall's tau	Number of under five stunted children	0.188 (0.054)	0.309 (0.002)	0.149 (0.128)

Table -1 shows that there is significant positive relationship between the variables with respect to under five stunting.Expenditutre on mother health,child health and grad total is more in those districts where prevalence of stunting is high.In all the variables relationship between child health budget and under five stunting is more stronger than other variales.These exp. includes free referral transport, incentives to ASHA,drugs supply, diagnostic services etc

Section-2

Variation in expenditure on mother and child health in tribal dominated districts.

Table-2

		Maternal health achieved budget	Child health achieved budget	Grand total
Spearman	Number of Under five	0.225	0.572	0.222

rho	stunted children	(0.265)	(0.007)	(0.333)
Kendall's tau	Number of under five stunted children	0.148 (0.349)	0.406 (0.010)	0.110 (487)

Table -2 shows that only child health budget has significant relationship with stunting whereas maternal health do not have significant relation with pervalance of stunting.

Section-3

Non tribal districts

Table-3

		Maternal health achieved budget	Child health achieved budget	Grand total
Spearman rho	Number of Under five stunted children	0.461 (0.012)	0.102 (0.599)	0.309 (0.103)
Kendall's tau	Number of under five stunted children	0.296 (0.024)	0.069 (0.599)	0.193 (0.143)

Table-3 shows in non tribal ditricks there is not significant relationship between child health achieved budget and stunting. Ideally there should be a relationship between these two variables because stunting is a result of long term malnutrition. Although it has a significant relation with maternal health expenditure and stunting is also linked with maternal health too such as BMI of the mother which results into intra uterine growth restriction, anemia in pregnant mother also affect the infant etc.

Conclusion-

Discussion

An attempt has been made to understand the factors which are influencing the nutritional status of tribal community of M.P. The tribal community is the most vulnerable community, they live in geographically isolated area with extreme poverty. As per NFHS-4 report infant mortality is very high in teenage mothers i.e. 72%..

Role of AWC is very crucial in providing supplementary nutrition to mother and child but unfortunately the food provided at AWC is the main source of food for the entire family i.e. the food provided to the

pregnant and lactating mother is the only source of food for entire family. AWC provides take home ration once a week .In tribal communities children under five are at high risk of under nutrition as adequate supplementary food is not provided at AWC.A study done by Rajesh Mishra(2017) justifies that there is very minute difference in the malnutrition level between the children who are taking supplementary food from AWC and children are who are not taking food from AWC. Apart from this there is very high burden of under nutrition in children which result in overcrowding in NRC .Yogesh Shukla(2017) while conducting his study in Jabalpur, Madhya Pradesh amongst the children admitted in NRC finds that long delay in referral and admission of severe malnourished children is a major challenge. Moreover parents do not stay for 14 days at NRC as most of them are daily wage laborers. Inaccessibility is also one the reason of food insecurity in tribal communities

To avoid stunting it is very important for the mother to have timely ANC visits and consume adequate nutrition diet during and after pregnancy. It is observed in the study done by Education also plays a key role in utilization of health services. Tulsi adhikari (2016)while conducting his study on tribal population of Rajasthan, Odisha, Chhattisgarh and Madhya Pradesh found that there is an association between education attainment and ANC visits i.e. Utilization of ANC was highest among those women with level of education 9th class and above.

In M.P various programs are running to upgrade the nutritional status of mother and child such as ICDS , Mangal Diwas, Rajiv Gandhi Teenager Girls Empowerment Scheme, Atal Children Health Mission, Madhya Pradesh Health Area Improvements Program (Foreign Aid), Minimum Need Program Special Nutrient Food Program, Teenager Empowerment Program.

Conclusion

Madhya Pradesh comes under the underperforming states in India in terms of attaining nutrition sensitive and specific globally identified indicators for under nutrition. The above study revealed the Scheduled Tribes are the under performing community in terms of nutritional related indicators and utilization of government facilities such as ICDS and other associated programs. Ideally the expenditure on the ongoing program should be according to the prevalence of nutritional indicators i.e. districts having higher number of stunted children receive more budget allocation. There should be a relationship between the nutrition indicators and ongoing program expenditure to ensure `smooth functioning. Government program such as ICDS which are supposed to provide supplementary food to the mother and child to improve their nutrition status but in reality especially in tribal dominated areas (Sheopur District tribal news, MP) supplementary source is the primary source of food and is consumed by the whole family instead of only mother and child