Study on
Nutrition Transition in Developing / Middle Income countries like India.

By

Dr. Navleen Kaur

Project report submitted in partial fulfilment of the requirements of the degree

MBA Hospital and Health Management

Academic year, 2019-2021

The IIHMR University, Jaipur

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Work from Home

Under guidance of IIHMR mentor

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TO WHOMSOEVER MAY CONCERN

This is to certify that **Dr. Navleen Kaur** , student of MBA Hospital and Health Management from The IIHMR University, Jaipur has undergone internship under the mentor of IIHMR from 20/04/2020 to 20/06/2020.

The Candidate has successfully carried out the study designated to her during internship and her approach to the study has been sincere, scientific, and analytical.
The Internship is in fulfilment of the course requirements.

I wish her all success in all her future endeavours.

Dean, Academics and Student Affairs
The IIHMR University, Jaipur

Professor
The IIHMR University, Jaipur

The certificate is awarded to

Dr. Navleen Kaur

In recognition of having successfully completed his
Internship Work from Home
and has successfully completed her Project on

Study on Nutrition Transition in Developing / Middle Income countries like India
(20 April 2020 – 20 June 2020)

She comes across as a committed, sincere & diligent person who has a strong drive and zeal for learning

We wish her all the best for future endeavours

Mentor **President and Dean IIHMR**
THE IIHMR UNIVERSITY, JAIPUR

CERTIFICATE BY SCHOLAR

This is to certify that the Project report titled **Study on Nutrition Transition in Developing / Middle Income countries like India** and submitted by **Dr. Navleen Kaur , Enrolment no :- 0941** under the supervision of **Mrs. Sunita Nigam** for award of MBA in Hospital and Health Management of the University carried out during the period from 20/04/2020 to 20/06/2020 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
Dr. Navleen Kaur
MBA-HM 24

ACKNOWLEDGEMENT

The opportunity provided to do Internship at Work from Home under the mentor of IIHMR was an enriching and valuable experience. I am highly obliged to have contact with so many experience professionals who led me throughout my study period I am sincerely grateful to them for sharing their truthful and illuminating views on several issues related to the project.

I would like to acknowledge, first and foremost **Nikita & Nikhita** who inspired, guided, and helped me to complete my project, I take this moment to recognize their contribution gratefully.

I am extremely thankful to my faculty at IIHMR- Jaipur and specially my **Mentor Dr. Sunita Nigam (Professor)** for being my support all through the internship.

I recognize this opportunity as a big milestone in the development of my career. I will strive to use the knowledge and skills gained in the best possible way.

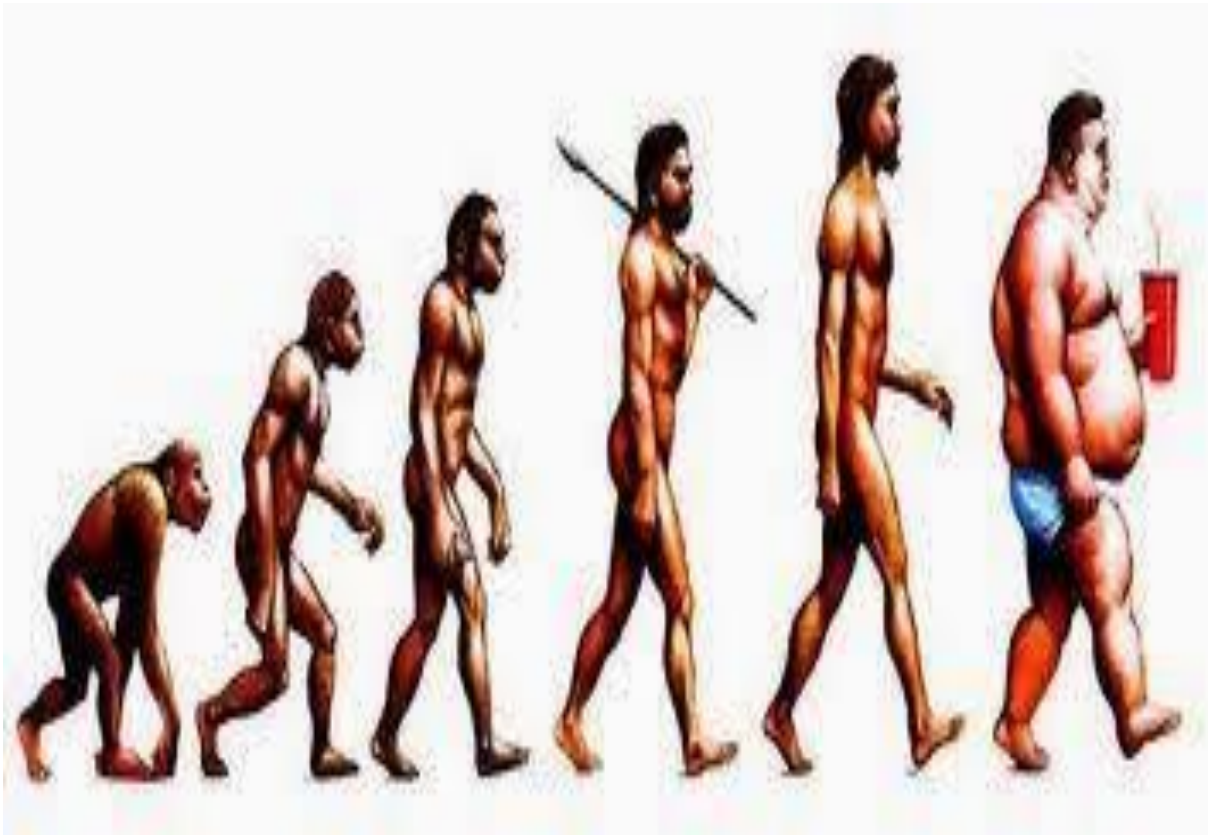
Lastly, I want to express my respect and love to my parents, siblings, and my friend **Pooja Panday** for constant encouragement and motivation in my higher studies.

Sincerely,

Dr. Navleen Kaur

Nutrition Transition in Developing / Middle Income countries like India.

- Navleen Kaur
- MBA HM



BACKGROUND

DEFINITION:

There is a change in diet, when a country undergoes changes in its economic, political, and social platforms, then the whole process can be recognized as a "Nutritional Transition" (Popkin 2003).

The traditional diets (differing by country) compared with processed foods, high on sugar and fats with low in fibre and nutrition rich cereals increase in various health issue along with double burden on the country's system.

OBJECTIVE:

Main Objective:

To study the nutrition transition occurring in developing / middle income countries like India, in relation to its determinants which are helping / accelerating the process leading into epidemic of obesity, chronic non communicable disease & environmental changes in India.

INTRODUCTION

After India's independence in 1947, India faced problem in generating enough food production, for population over 3/4th were poor, with no food security , lacked necessary nutrition and remained ill, with life expectancy at around 33.

Now, India as a whole and its different states with a population exceeding 1.3 million in 2020, contributing 17.7% of the total world population India is self-sufficient and having the fastest growing economy. It's saw a visible reduction in morbidity and more than doubled became the life expectancy

As per the article, India is most likely to achieve SDG target of being self-sufficient in food production and reaching the optimal nutrition level till 2030. The National Food Security Act was made to protect the poor against the impacts of food inflation (1)

This paper summarizes some issues and deep study of the dietary changes impacts linked with the nutrition transition, occurring commonly in the developing / Low, Middle income countries, while going through economic development which are linked with the leading major health related situations.

The reasons behind these changes is due to the following key factors on which we will be discussing & stressing more under coming headings :

- Globalisation (Expansion of global networking of food market. (Popkin 2003)
- Urbanisation
- Economic growth
- And modernisation of Agriculture

In Olivier et al. (2008) it was stated that due to the ***social globalisation*** happened around the globe, it caused a convergence of goof cultures across different countries & consequently leading to the convergence of **nutrition patterns**

Urbanisation played another leading factor, showing a significant prevalence with the diet and lifestyle changes.

In middle income developing countries, there has been an economic growth leading to a significant increase in the income status. Changes in food intake & more sedentary lifestyle has been a result of **economic growth** which led to *double burden*. While there were existing problems of hunger and undernourishment , there was an increased of diet- related health issues , leading in under, overnutrition and malnutrition.

In countries like China & India which are already noticing the 'nutrition transition' phase shown significant **environmental impact with certain** indicators including greenhouse gas emissions, water usage, land usage etc.

Key words: nutrition transition, economic growth, dietary change, obesity, economy, Nutrition Transition; Under-Nutrition; Over-Nutrition; Food Security; Non-Communicable Diseases; Dual Nutrition Burden

RESEARCH QUESTION

The research questions addressed in this paper are -

- What are the key determinants for the nutrition?
- Transition happening in the developing countries like India.
- How Economic growth of a country impacts the Nutrition Transition?
- Does Urbanization play a role in Nutrition Transition in India?
- Is there any relation between the Nutrition Transition with the Environment?

LITERATURE OF REVIEW (LOR)

First Study which was done on the **ROLE OF GLOBALISATOIN AND URBANISATION ON DIETARY CHANGE.**

The wake of Globalization was first felt in the 1990, which can be marked as the underlying root cause of this shift. It impacts all the interregional flows and networks of interaction across the globe which is force which can neither be ignored nor halted.

Globalisation provides growth to the national economies by exposing the countries to new ideas & technologies, creating more employment opportunities , improving income with positive influence on health and nutrition status of the people across the world.

Although it is also one of the major leading factors which has rapidly increased the pace of nutrition transition, which can be seen accelerating in the lower- & middle-income countries. The shift seen in dietary and lifestyle patterns seem to be occurring quite rapidly.

Another determinant adding to this transition is **urbanisation** in these developing countries which is leading to the shift in occupational structure.

Will be discussing it under 3 major transitions which are interlinked with urbanisation.

- Nutrition transition
- Demographic transition
- Epidemiological transition

- **Nutrition Transition**

From rural to urban, the lifestyle has a significant change in the dietary habits & change in the pattern of physical activity among the population. Such rapid changes led to emerging problems like unhealthy eating, overweight, malnutrition, obesity (2), prevalence of NCD, and a distinctive difference in the lifestyle of the rural population verse the urban population. (3,4)

- **Demographic Transition**

Though there is a decrease in the population growth curve but population development due to *rural-urban shift*, is continuously increasing. It is said to increase by 2030 in the countries where there is a nutrition transition for example Asia, Latin America, Middle east, Africa.

With progression seen in Health, there was a significant decline in child mortality and downward curve of fertility & increasing life expectancy (5,6) has led to the population development. Also, the level of malnutrition with increase in population in many countries will have a huge impact on new strategies in dealing with food needs and also require attention to the non-communicable diseases (7)

- **Epidemiological Transition**

In different developing countries with varying income, with improvement in the economic conditions, there is *occurring triple-burden of malnutrition*. Developing countries are still struggling with undernutrition while there is an emerging problem due to *overnutrition* such as obesity, overweight, unhealthy snacking, sedentary lifestyle. Non- communicable disease when combined with smoking, alcohol, hypertension, lack of exercise and physical fitness are led to cancer and more chronic problems. All these problems were the issues from the ***westernised societies*** but resulting in a major health problem in the middle incomed & developing countries. (8)

One of the major causes for leading problem of Obesity is also Nutrition transition, occurring due to influence of the adaptation of the modern culture. Even WHO & national government has accepted it. CVD metabolic syndrome is developing as a health concern which are reported to be linked directly to diet, nutrition, physical activity weight manage, & also Nutrition Transition. (9)[1]

The second study which is taken for the review showed "how industrial revolution (1770 through 1850) was linked with the nutrition transition occurring in these countries"-

- **Impact of industrial revolution (1770 through 1850)**

It took quite a lot of time to reach the developing countries after the Agro-industrial revolution started. The factors which initiated Agro-industrial revolution in 1960s in developed countries touch-downed the agricultural & food sectors of the developing countries. Due to the use of high-yield varieties of food, the food input supply was increased in the developing worlds.

Since 1960s, the average calorie availability in the developing countries has increased from about 1 950 to 2 680 kcals/person/day while protein availability doubled from 40 to 70 g/person/day.(10)

Did economic growth really play a role in nutrition transition?

Here in this study where SEP (Socio economic patterning) was reported and resulted in proving that children with better facilities & educated parents were fed but yet there were health related issues.

- **Socio- economic patterning of food consumption and diversity among Indian children : evidence from NFHS-4**

Just like basic requirements like air & water, food is for survival and for a balanced diet for essential nutrients (11). The right amount is important for the growth, development, and healthy outcomes in adults & as well as for the growing children (12). Even after so many advancements in health and development departments in India, (13), the burden of children under nutrition and micro-nutrient deficiency remains high (14,15). Approximately 70% & 40% of the children suffer from inadequate dietary intake & remain stunted respectively (16).

While there has been improvement in food production and its distribution (17), but most of the rural population and the local communities continue to face problems in terms of food assurance. As per GHI (Global Hunger Index) over $1/5^{th}$ of India's population still suffers from chronic hunger & ranks 100^{th} among 119 countries in the 2017 (18).There are several studies which shows a significant relation between the dietary diversity, with diet quality, micronutrient intakes, & better nutritional status of children & household food security . Also (SES) Socio Economic Status, may show the association with the overall dietary patterns, dietary quality, in -Middle income countries.

Also, there is an association between having a higher parental education with better employment with good income and thus better purchasing power to buy nutrient rich food, by having a proper knowledge for the same.

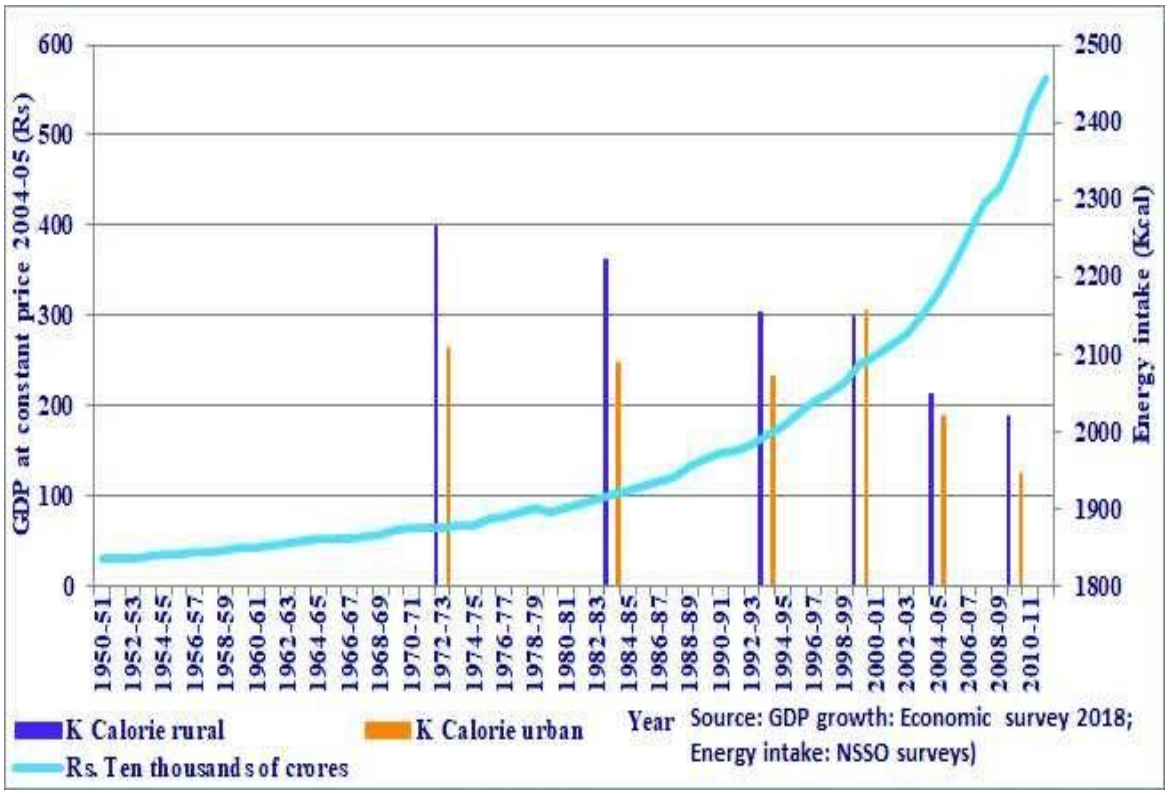
Why according to India's GDP report showed that with increase in per capita income in last three decades was associated with reduction in per capita energy intake ?

- **Economic Growth and Energy Consumption**

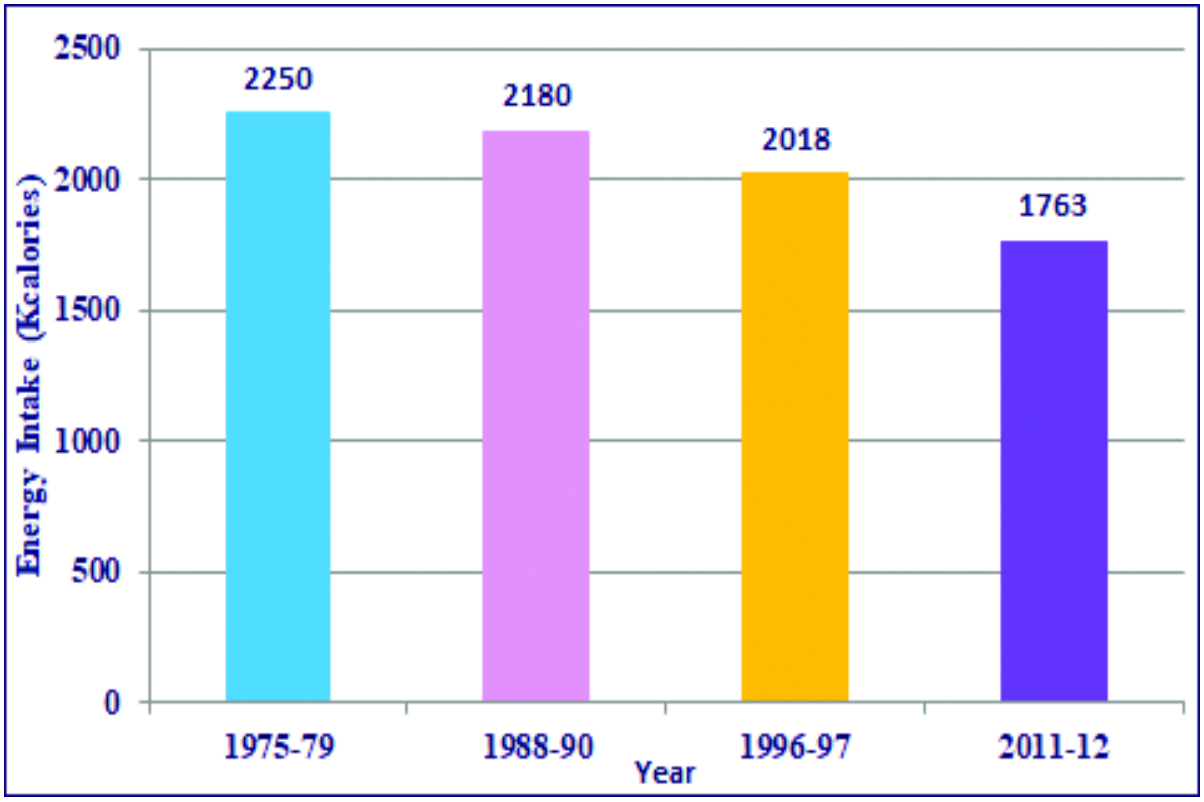
The Indian economy between 1960-1990, showed relatively slow growth but due to Globalisation, the developing countries experienced rapid increase in economic growth, resulting in an increase intake of total energy and more consumption of animal foods. Leading into sedentary lifestyles & rapid increase in over nutrient rates. GDP data showed

the growth in India at constant prices (2004-05) from 1950-2012 (Economic Survey 2018) and the per capita energy intake for both rural & urban households over the same period (as per the data collected from NSSO survey) (Fig.1) showed that the increase in GDP growth & in per capita income in the last 3 decades was linked with reduction in per capita energy intake in both rural & urban areas. (Fig.2)

It's possible that having a healthy lifestyle perceptive, Indian realized that their physical activity has reduced , resulting in decrease in their energy intake. This could explain the slow increase in over-nutrition rates in India, when compared to those developing countries that underwent rapid economic transition.



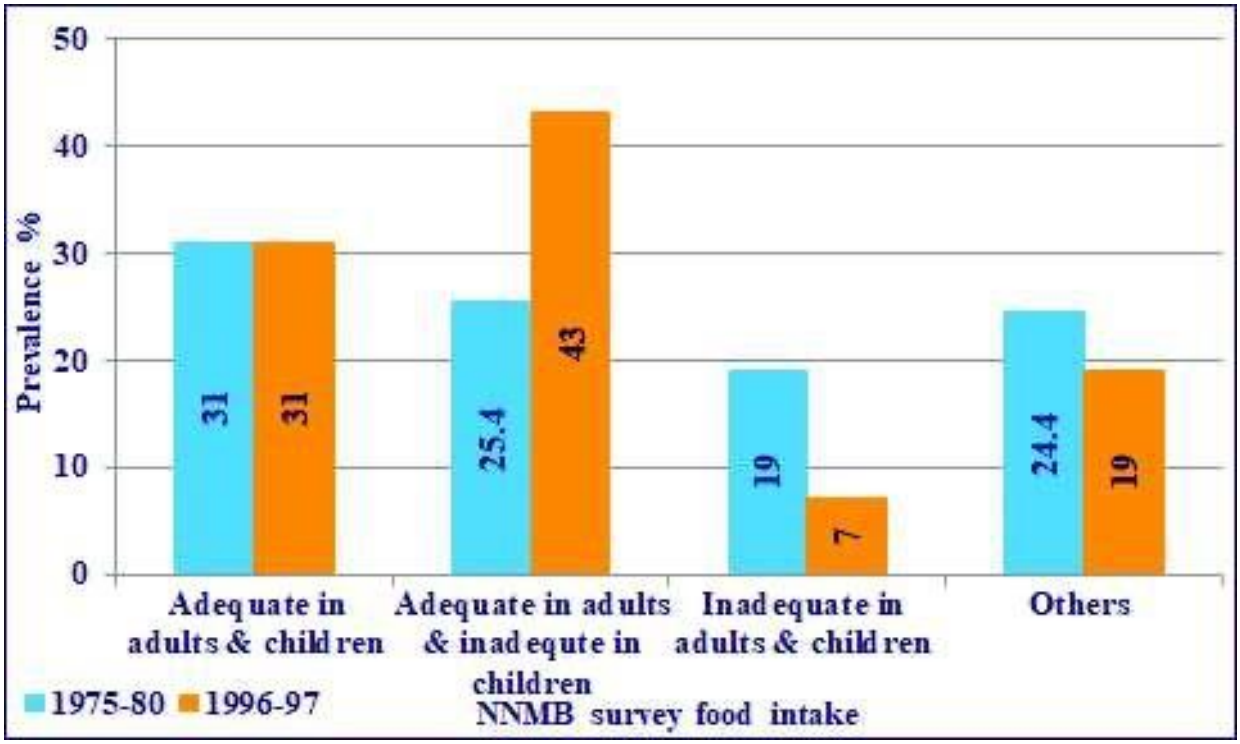
(Fig.1)



(Fig.2)

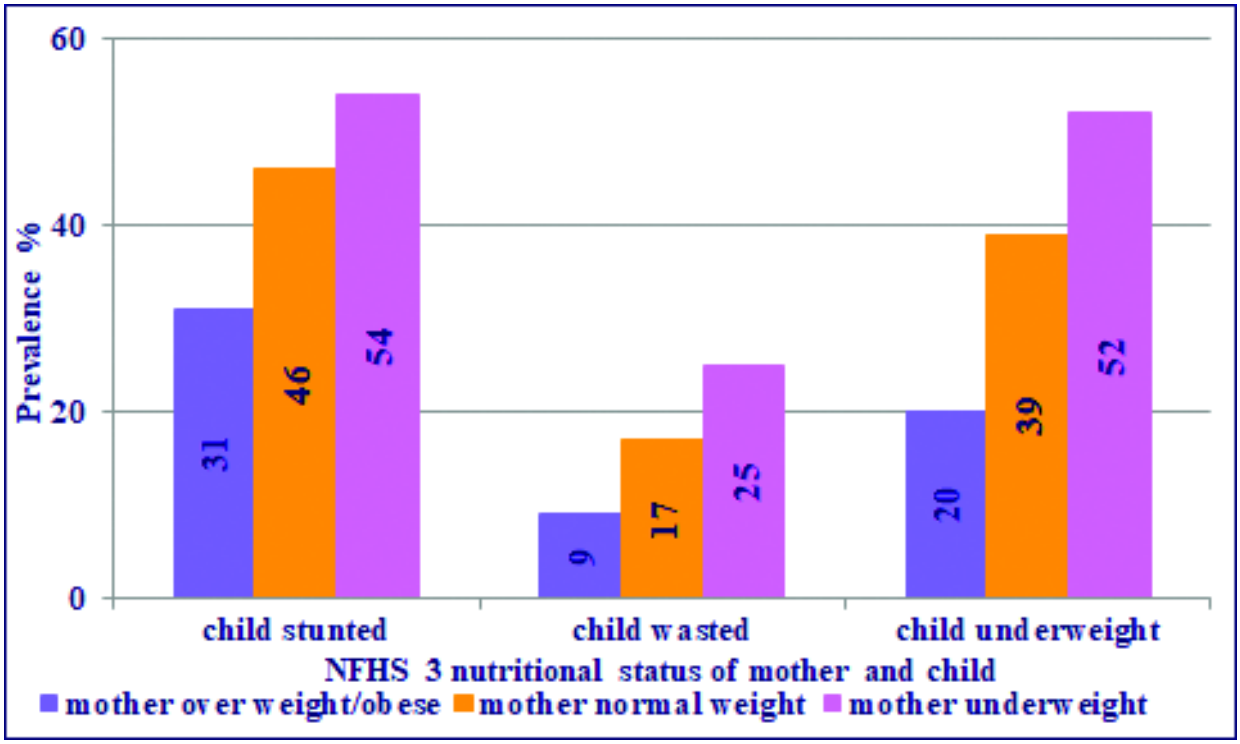
Have shown some of the stats with various linking factors, which have proven the shift in nutrition transition over time

It became prominent that even in the households where adults are getting adequate food, children are not getting adequate food (Fig.3). Data from NNMB surveys have shown that the situation has worsened over years- in 2012 in over 50% of the household's adults are getting adequate food but children are not.



(Fig. 3)

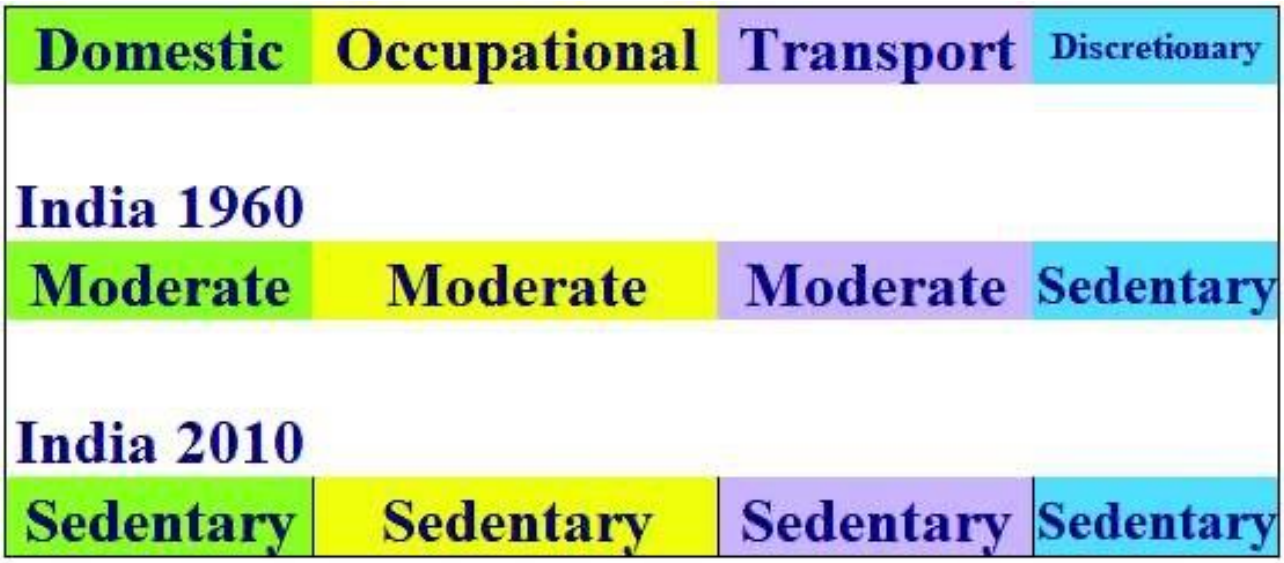
While analyzing the nutritional status of mother with the status of her under-five-child, it showed that Child wasting rates were higher 25% when the mother was under-nourished. But even when mother was normally nourished, over 17% of children were wasted (Fig.4). Data from National Family Healthy Survey (NFHS) 3 (IIPS 2006)



(Fig. 4)

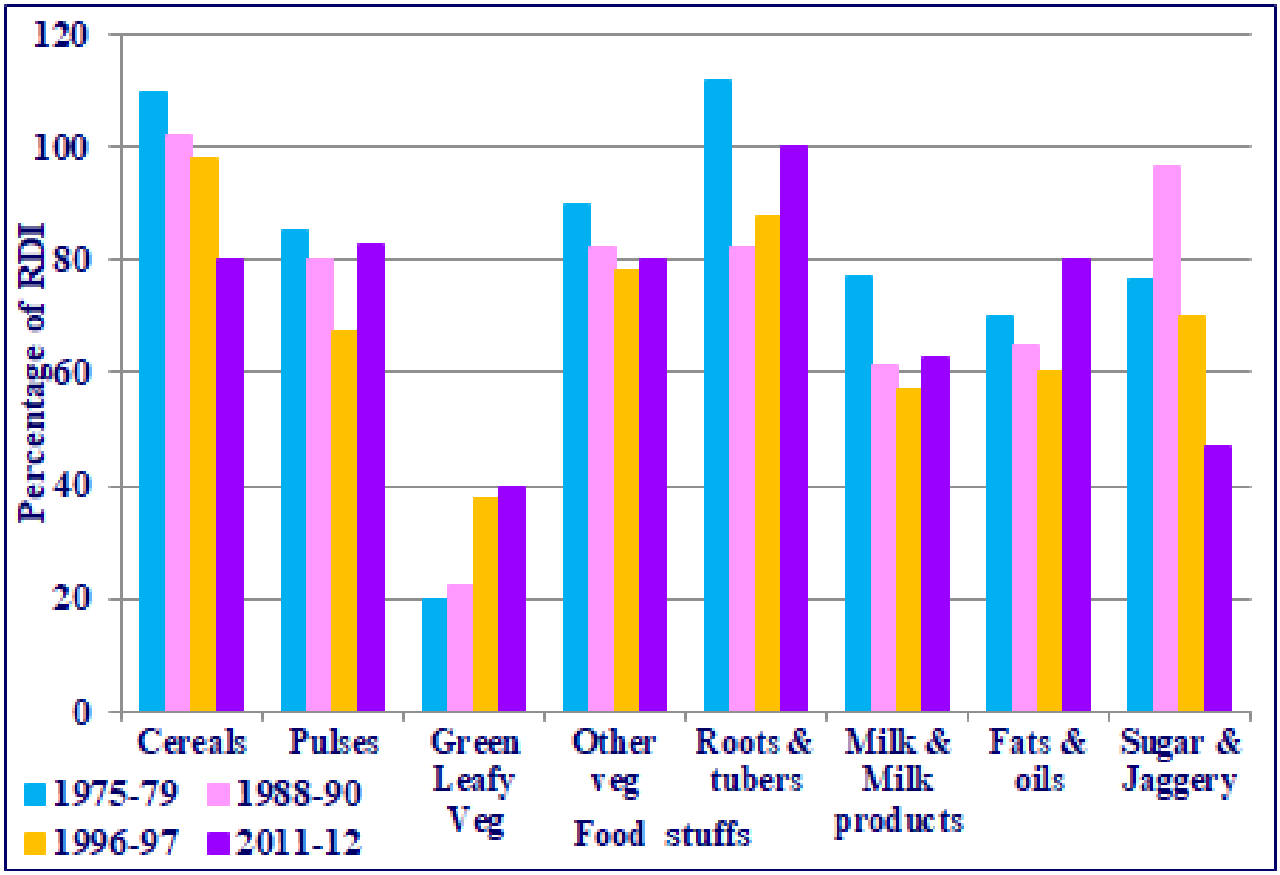
In the 1950s and 60s, Indian including both men and women had adequate physical activity because a lot of manual work was involved in domestic as well as occupational activities.

Due to globalization, occupational and household activities have become increasingly mechanized, and as a result, majority of Indians showed a shift from active lifestyle to having a sedentary life style (Fig.5)



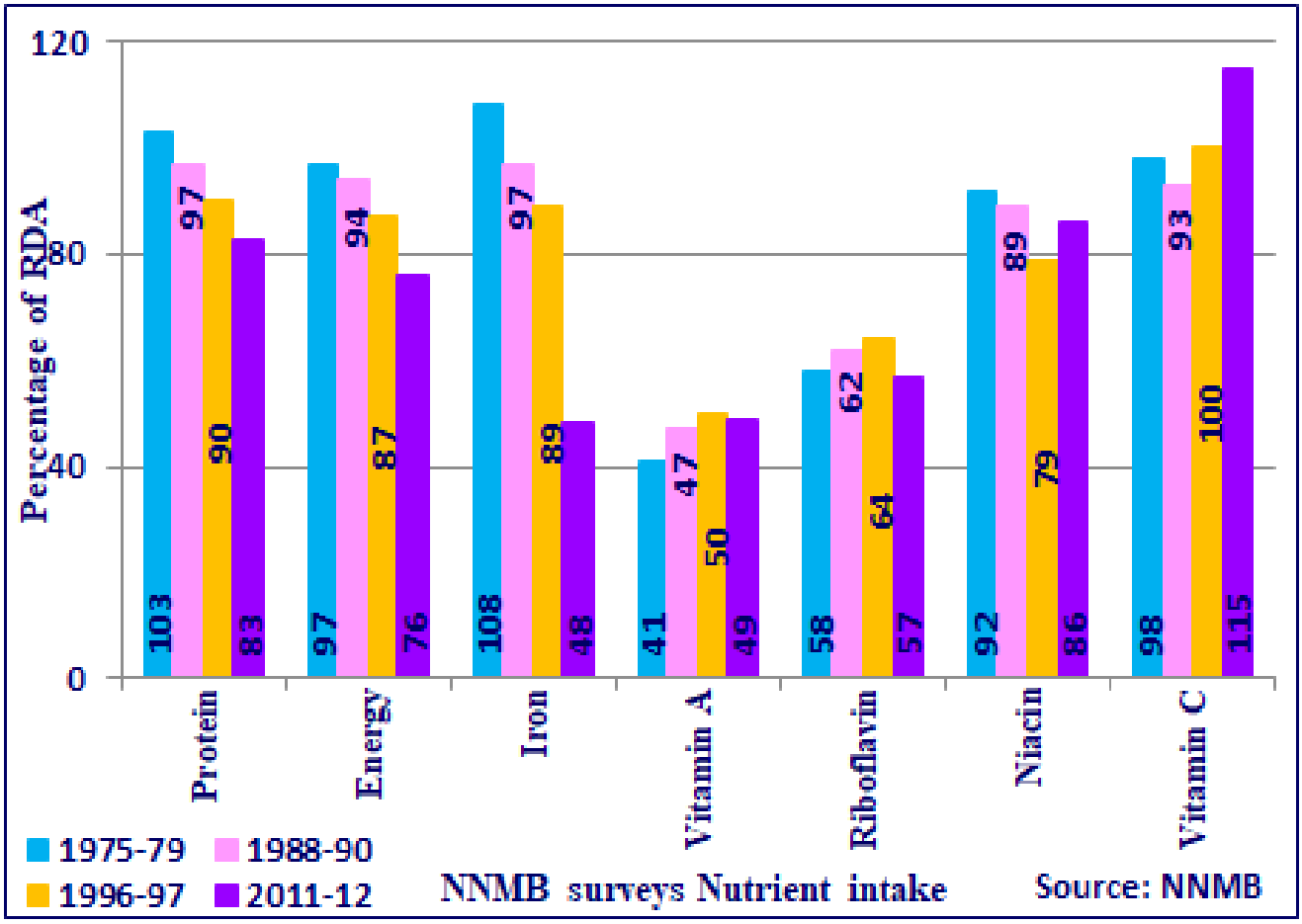
(Fig. 5)

According to the NNMB repeat surveys on dietary and nutrient intake of rural population between 1975 and 2012, it showed that over the last four decades there has been a reduction in cereal and pulse intake till 1997, but the trend was reversed by 2012. There has been some increase intake of fatty, oily and green leafy vegetables. The intake of milk & vegetables remain lower than the required amounts. Dietary intake of food stuff expressed as a percentage of RDI is presented in Fig.6.



(Fig. 6)

There was a considerable decrease in total energy intake & of protein over years, according to the NNMB data on nutrient intake as a percentage of RDA is given in Fig. 7.[2]



(Fig.7)

And the modernisation of Agriculture leading to environmental impact.

Third study was done **by Rockstrom et al. (2009) on planetary boundaries framework was used to estimate the environmental impacts**. It was defined as the safe place for humanity with respecting the mother Earth & also its biophysical subsystems as in- Land usage, aerosol atmospheric loading, climatic change, loss of biodiversity, freshwaters use, ozone depletion, ocean acidification & chemical population. Cereals, crops, vegetables, meat, milk, fruits, oil crops, were the main food commodities which were important in the nutrition transition.
The environmental impact due to nutrition transition were measured through six indicators, namely – GHG emissions, mineral, phosphate, water footprint & land area

- Modeling showed that change in future nutritional habits will have it's impact on GHS through food production (Smith et al. 2013)
- The increasing demand for dairy,eggs & meat products are leading to rapid increase in landless, impact on the quality of water, & livestock systems (Liang et al. 2013). Manure

of animal is usually dumped into nearby waters, leading to nitric oxide release (Wang et al. 2019, 2011).

- Eutrophication of water caused by the excessive flow of nutrients with a negative impact on biodiversitys and exacerbates climatic changes via nitrogen emissions (Kahiluoto et al. 2014)

RESEARCH METHODOLOGY

This study is based by undergoing representative large-scale surveys in the Developing Middle-income countries, reference to some stats e.g.- FAOSTAT/NNMB data to get a better picture of the major changes happening during the diet transition.
Used various search engine like Google search, Pub-med., Research-gate and referred various papers for review of literature. It includes a review of the published research papers, literature and other verified documented data on population characteristics.

RESEARCH DESIGN

TYPE OF STUDY: Observational Descriptive study

DUARTION OF STUDY: Two months (20 April 2020 – 20 June 2020)

TOOL OF DATA COLLECTION: Secondary data is collected through online portals with the help of various search engine. Through registered papers , literature available online and by some research articles

ANALYSIS

- The rapid shift has been seen in diet of the developing country people.
- Due to Westernization impact in the country like India, Huge change has been observed as the consumption of more processed food is increased among the generation over the time.
- In the year 1975-1980 which is considered as high-income world period, main source which change the dietary need was edible oil in lower- middle income countries. But due to change in time, major shift was seen in developing countries.
- With change in the income, Fat consumption is also increased.
- Consistent Increment in the advancement in the food pattern, lead to double burden situation.
- Change in prices also affected the consumption pattern. It impacted all equally either it is rich group or poor group, but undoubtedly most impacted ones are lower-income groups.

- Most commonly This area is really one relatively ignored by the profession but one deserving of much more research.

SUMMARY & CONCLUSION

A review of the food situation in India indicates that :

- Economic growth is helping the country to achieve the poverty reduction, and improvement in " quality of life " mentioned in the SDG Target for 2030 but effective implementation of the National Food Security Act will protect the population from the adverse effects of food price inflation and provide universal food security in both the urban and rural population.

- The ongoing of Nutrition Transition is linked with the double burden on these developing and middle-low income countries so the countries like India has to invest in sustainable programs all the macro, micro and to make them accessible and affordable.

- Nutritional policy should promotion a sustainable dietary model.

- Meanwhile newer challenges have emerged in the form of a rise in over nutrition and associated non- communicable disease. There is a need of lifestyle management modifications. The health system of India needs to be reoriented for attainting proper & early detection, prevention and effective system to manage the double nutrition burden. The systems have to strengths the structure as well as correct weaknesses. The citizens should be encouraged for adapting healthy lifestyle with necessary modifications. If we do so, these challenges will become opportunities for progress enabling the country to achieve the WHO/SDG nutrition targets and improve the " Quality of life " (QoL) of citizens by 2030

- Environment preservation is also kept in mind in this challenging situation.

- A diet model which is nutritionally healthy and balanced, rice in biodiversity, conserves and respects the environment and should have a beneficial role in development of the overall population.

REFERENCES

1- Bhargava S K, Sachdev H P S, Fall C H D, Osmond C, Lakshmy R, Barker D J P, Biswas S K D, Ramji S, Prabhakaran D and Reddy K S (2004) Relationship of Serial Changes in Childhood Body Mass index to Impaired Glucose Tolerance in Young Adulthood N Engl J Med 350 865-75

2- De-Onis M & Blossner M (2000) Prevalence and trends of overweight among preschool children in developing countries. A J Clin Nutr 72, 1032-1039

3- Popkin BM (2001) The nutrition transition and obesity in the developing world. A J Nutr 131,87 35

4- Gaziano TA (2007) Reducing the growing burden of cardiovascular disease in the developing world. Health Aff 26, 13-24

5- Ragui A & Farzanch RF (2008) Shaping the Future : a long term perspective of people and job mobility for the Middle East and North Africa. World Bank (http://go.worldbank.org)

6- United Nations Children's Fund (2013) Levels and Trends in child Mortality : The Estimate developed by UN Inter-agency group for child Mortality Estimation (http://www.childinfo.org/files/child-mortality-report-2013.pdf)

7- Karoui H. Global Trends in Gulf and Middle East Population Evolution National Security and Foreign Relations Law eJournal 11/2006; http://ssrn.com

8- Getz GS & Reardon CA (2007) Nutrition and cardiovascular diasease. *Arterioscler Thromb Vasc Biol* **27**, 2499-2506.

9- Rguibi M & Belahsen R (2004) Metabolic syndrome among Moroccan Sahraoui adult women. *Am J Hum Biol* **16,** 598-601

10- Senior Economist, Global Perspectives Studies Unit and Chief, Nutrition Planning, Assessment and Evaluation Service, FAO. Plenary paper presented at the 97th Seminar of the European Association of Agricultural st nd Economists, University of Reading, England, 21 - 22 April, 2005. The views expressed by the authors in this document do not necessarily represent those of FAO.)

11- Ruel MT, Arimond M. Dietary diversity and growth: an analysis of recent demographic and health surveys. In: Brower ED, Traore AS, Treche S, editors. Food based approaches for a healthy nutritionin West Africa. Ouagadougou: University Press; 2004.
12- Charmarbagwala R, Ranger M, Waddington H, White H. The determinants of childhealth and nutrition: a meta-analysis. Washington, DC: World Bank; 2004.
13- Balarajan Y, Selvaraj S, Subramanian SV. Health care and equity in India. Lancet.2011;377:505–15.
14- Kehoe SH, Krishnaveni GV, Veena SR, Guntupalli AM, Margetts BM, Fall CH, et al. Diet patterns are associated withdemographic factors and nutritional status in South Indian children. Matern Child Nutr. 2014;10:145–58.
15- Aurino E. Do boys eat better than girls in India? Longitudinal evidence on dietary diversity and food consumption disparitiesamong children and adolescents. Econ Hum Biol. 2016. https:// doi.org/10.1038/s41430-018-0162-6.
16- International Institute for Population Sciences (IIPS) and ICF. National Family Health Survey (NFHS-4), 2015-16. Mumbai:IIPS; 2017.
17- Pingali P. In: Pingali P, Evenson R, editors. Handbook of agri- cultural economics.Amsterdam: Elsevier; 2010. p.3867–94.
18- Grebmer VK, Bernstein J, Hossain N, Brown T, Prasai N,

Yohannes Y, et al. Global Hunger Index: The inequalities of hunger: Synopsis. Washington, DC, Bonn, and Dublin: Interna- tional Food Policy Research Institute, Welthungerhilfe, and Concern Worldwide; 2017.

SUMMER TRAINING REPORT

Name of the Course -

The name of the course is ‘Entrepreneurship in Emerging Economics’ provided by eDx.

Objectives of the Course -

The aim of this course were

-Explore entrepreneurship opportunities in countries which lack access to :

a) Goods
b) Staff
c) Finding institutional voids

-Understand entrepreneurship with profit and based on capital, in contrast to entrepreneurship for charity.

Course Contents -

The course is divided into two Chapters under which we have various topics which are covered.

Chapter 1

-Introduction to Institutional voids

-Entrepreneurial interventions

-Alibaba and Taobao Villages.

Chapter 2

-The Narayana Model of Tertiary Care

-Business Model for Affordable

-Cardiovascular Care

-Charity and Sustainable Healthcare Interventions

-Evolution and Transferability

-Entrepreneurship and the Narayana Model

-Understanding and Tackling Chronic Diseases

-Farmacias Similares

Learning Methodology used in the course

-In this course, have learned from various pictorial graphs shown along with the videos

-Problem solving assignments to acknowledge the problem and finding creative solutions to it.

-Situational based assignments, which was based on reasoning & problem solving.

-The course used engaging ppts, videos & lectures.

-Even cartoon representation was present to simplify the topic for better understanding.

-Lastly, the course provided us with reading materials, which we can access even after the completion of the course.

Key Learnings from the Course

Learnt about the Institutional voids.

- It is when a country lacks what an entrepreneur can offer.

- Adaption of existing business model & by

- Collaborating with domestic partners

Client & seller relationship

-It is essential that clients and sellers have a base of trust between their deal.

-Laws between countries are different so creation of standardization training is important.

Issues Entrepreneur encounters

1)Corruption – To tackle this transparency, gathering data/numbers and publishing it for the public to acknowledge whether or not it’s relevant

2)E-Commerce in China – Alibaba was the original platform for china’s online seller so due to the surge of Ebay, it was necessary to innovate Taobao.

Study and Discussion on the Narayana Healthcare, India

About it – Affordable tertiary care with 40% of patients pays Less than it takes for the hospital to treat them. It happened due to " Entrepreneurship for charity"

Health concepts were discussed that 2.5 million people require heart surgery and it is cheaper to treat if diagnosed early. Early challenges faced by the institute was most patients were from rural areas and reachability was a question mark. Along with it, expensive treatments were of major concern

Solution to this was – As the requirement was on large scale (2.5 million people needed the surgery) they took it as an advantage. They got fixed salaries for the doctors & the surgeons became well practiced because they did so many surgeries leading to low mortality rates. They amortize fixed costs & had good negotiation for low prices per units.

-Learnt the Economies of scale where The greater the quantity of good produced, the lower the unit fixed cost will be. The factors affecting this was the internal factors related to inside of the company and external factors, arises from external factors eg. Factory size.

Narayana is Self- sustaining.

-To tackle outreach, they resorted to telemedicine

-Patients who can pay, pay whatever they can afford. This money is then used to treat those who can't afford.

-Creation of 10$ insurance, which due to scale is able to balance out.

-It is called "Stochastic Optimization Model"

Thank You