

**A STUDY ON EXPOSURE TO MEDIA, TOTAL
FERTILITY RATE AND NUTRITION HABITS AS THE
DETERMINANTS OF PREVALENCE OF ANEMIA IN
WOMEN
&
LEAN AND SIX SIGMA- GREEN BELT
ANEXAS CONSULTANCY**

A Report

by

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Table of Contents

PART-A

PART-A.....	3
LIST OF ABBREVIATIONS	6
ABSTRACT	7
INTRODUCTION.....	7
METHODS	7
RESULTS	7
CONCLUSION	7
KEYWORDS:.....	7
INTRODUCTION.....	8
OBJECTIVES.....	9
LITERATURE REVIEW	9
SEARCH STRATEGY.....	9
METHODOLOGY	12
DATA SOURCE	12
INCLUSION AND EXCLUSION CRITERIA	13
RESULT.....	14
MULTIPLE REGRESSION ANALYSIS RESULTS	15
DISCUSSION	15
EXPOSURE TO MEDIA	16
TOTAL FERTILITY RATE.....	16
CONSUMPTION OF DARK GREEN LEAFY VEGETABLES BY WOMAN WEEKLY	16
CONSUMPTION OF FISH/CHICKEN/MEAT BY WOMAN WEEKLY	17
ALCOHOL CONSUMPTION BY A WOMAN	17
CONCLUSIONS.....	17
RECOMMENDATIONS	18
LIMITATIONS.....	18

PART - B

INTRODUCTION.....	23
LEAN	23
SIX SIGMA	23
LEAN AND SIX SIGMA	23
ATTITUDE AND DISCIPLINE.....	24
OPERATIONAL EXCELLENCE	24
SIGMA LEVEL	24
OBJECTIVE.....	25
DMAIC: AN IMPROVEMENT METHODOLOGY	25
DMAIC ROADMAP	25
DEFINE	25
OBJECTIVES	25
STEPS.....	26
MEASURE PHASE.....	26
OBJECTIVE:.....	26
THE SIGMA OF A PROCESS.....	26
ANALYSE PHASE	27
OBJECTIVE.....	27
CAUSE AND EFFECT DIAGRAM-	27
CONTROL IMPACT MATRIX	28
PARETO CHART	28
PROCESS MAP	29
7 (8) WASTES (MUDA)	29
IMPROVE PHASE	30
OBJECTIVE.....	30
STEPS:.....	30
IDEA GENERATION	30
CONTROL PHASE	30
OBJECTIVE.....	30
STEPS.....	30
CONTROL	30
FIVE S	31
LEARNING METHODOLOGY.....	31
KEY LEARNINGS.....	31

BENEFITS OF USING LEAN SIX SIGMA	31
CERTIFICATE.....	32
ANNEXURES.....	33

LIST OF TABLES – PART B

TABLE (B) 1.1 SIGMA LEVEL	25
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LIST OF FIGURES – PART B

FIG. 3. 1 DMAIC ROADMAP	25
FIG. 5. 1 THE SIGMA OF A PROCESS	27
FIG. 5. 2 VOC AND VOP	27
FIG. 6. 1 CAUSE & EFFECT DIAGRAM.....	28
FIG. 6. 2 CONTROL IMPACT MATRIX	28
FIG. 6. 3 PARETO CHART	29
FIG. 6. 4 PROCESS FLOWCHART	29
FIG. 6. 5 TYPES OF WASTE (MUDA)	29

LIST OF ABBREVIATIONS

1. WHO- World Health Organization
2. ANOVA- Analysis of Variance
3. VIF- Variance inflation factor
4. NFHS- National Family Health Survey
5. DGLV – Dark Green Leafy Vegetables
6. F/C/M- Fish/Chicken/Meat
7. TFR- Total Fertility Rate
8. MLR- Multiple Linear Regression

ABSTRACT

Introduction

Anemia is one of the serious public health issues worldwide. It most commonly occurs in women of reproductive age (15-49 years). The result of anemia can be drastic and may even lead to maternal morbidity or mortality. According to National Family Health Survey-4, the prevalence of anemia in Indian women of reproductive age group is 53.1%. A cross-sectional study was conducted with an objective to establish an association between the prevalence of anemia with exposure to media, total fertility rate and nutrition habits.

Methods

Datasets from NFHS-4 (2015-16), was used to identify the major factors associated with prevalence of anemia in woman. NFHS-4 was conducted in states & union territory of India which interviewed approximately 571,660 households, which is expected to yield a total sample of 628,826 women for the mentioned variables & data. Multiple Linear Regression method & Stepwise regression has been used on the data extracted from the NFHS-4 reports.

Results

Multiple regression analysis shows that exposure to media, consumption of dark green leafy vegetables, and alcohol consumption has a significant impact on the women anemia status. Total fertility rate and consumption of Fish/Chicken/Meat did not show a significant impact.

Conclusion

The study showed the importance of exposure to media and intake of balanced diet to reduce odds of anemia. Specific interventions are required. Efficient and effective programs need to be implemented to increase literacy, awareness and improve socio-economic conditions of women to combat anemia.

Keywords: Anemia; Women; Multiple Regressions; consumption of Alcohol, Chicken/Fish/Meat, dark green leafy vegetable; total fertility rate; media exposure

INTRODUCTION

Anemia is considered one of the major public health issues. It affects people of both the developing and the developed countries. However, the impact of anemia status in developing countries is considerably different as compared to developed countries.

The problem of anemia in any country can damage both the economic and social development of the country. It can occur in people of all ages but it mostly affects woman of reproductive age. There are about 1.62 billion people worldwide who are suffering from severe, moderate, or mild anemia [1]. As anemia is a serious public health problem hence it can also lead to the generation of other health issues such as Thalassemia and Iron-deficiency anemia. The anemia patients in Africa and Asia are more in number as compared to the rest of the world. The main reasons for this are poor diets, insufficient food, nutritional deficiency, genetics, and infectious diseases [2]. The maternal death caused in middle and low-income countries is nearly 120000 whereas 18% of death is caused due to iron deficiencies. According to research, South Asia has a higher percentage of anemia in contrast to other countries [3]. Indian people also suffer from anemia and every year more than half of the deaths are caused by anemia [4]. India woman having reproductive age group (15 to 49) are mostly anemic. The normal level of hemoglobin for pregnant women of reproductive age group is 11 g/dL and for non-pregnant women is 12 g/dL. Similarly, the anemia level also varies between non-pregnant and pregnant women [5].

There have been many studies in past, which have focused on various socio-economic factors affecting prevalence of anemia in woman globally as well as in India. Over the last few years, the pattern of diseases has changed due to the change in lifestyle. Various lifestyle indicators like smoking, alcohol drinking and chewing tobacco is prevalent. Many studies have shown a close association between prevalence of anemia and lifestyle factors but very smaller number of researches has been conducted in India to study the same.

Prime objective of this research is to understand the prevalence of anemia among women and to examine the contribution of exposure to media, TFR and nutrition habits.

OBJECTIVES

So, the present study focuses on the following research question;

Does exposure to media, total fertility rate and nutrition habits affects prevalence of anemia in Indian women of reproductive age (15-49 years)?

This research question diverts to the Objectives for this study which are:

- To assess the different factors which exclusively affects the prevalence of anemia in woman
- To assess the relationship between exposure to media with prevalence of anemia in woman.
- To assess the relationship between total fertility rate with prevalence of anemia in woman
- To establish relationship between consumption of dark green leafy vegetables and prevalence of anemia in woman
- To establish relationship between consumption of chicken/meat/fish and prevalence of anemia in woman
- To establish relationship between consumption of alcohol and prevalence of anemia in woman

LITERATURE REVIEW

SEARCH STRATEGY

Several studies have been published which explains the different factors which affect the prevalence of anemia in women. Literature review for this study is Non-systematic literature review, which includes the published study & research papers from Google Scholar, PubMed (ncbi) site, Research Gate and Hindawi. Inclusion criteria for literature review is that all the papers which included the various socio-economic, lifestyle and nutrient habits affecting women in reproductive age group. Studies which included NFHS as source of data have been included in this review. All those studies which included only children or factors other than used in the study have been excluded from the literature review. According to G. S. Toteja

and Padam Singh, anemia is one of the serious health issues among pregnant women and children. The prevalence of anemia in pregnant women is from 33% to 89% while it is more than 60% in adolescent girls. For the resolution of this problem folic acid and iron, tablets should be distributed among pregnant women in India [16]. According to a research, education and public awareness related to improvement of hygiene, housing facilities and sanitation, nutrition and health has a significant effect in lowering the odds of anemia [17]. During pregnancy, severe anemia may result in maternal mortality, premature delivery, low birth weight, and maternal morbidity. However, mild anemia can also cause a decrease in work output [11] [12].

Exposure to media

A study was carried out on women of reproductive age in Rwanda which reveals that there are 19.2% women who had anemia in them. Findings showed that there is no significant relationship between exposure to media and prevalence of anemia among women [6]. The prevalence of anemia in lactating women or pregnant women is considerably high in comparison with non-lactating or non-pregnant women. Findings of the study revealed that with an increase in exposure to media, the risk of anemia reduces among the non-pregnant & pregnant women. [9]

Total Fertility Rate

There is statistically significant relationship between number of children and prevalence of anemia among women [13].

Consumption of DGLV

Study shows that in terms of body weight, hemoglobin, vitamin A and iron status, a monotonous but micronutrient-rich diet with whole meal millet and DGLV was advantageous over a diet consisting mainly of polished maize or rice and insufficient amounts of basically more readily available fruits and DGLV [7].

Study does not find any significant relationship between consumption of green leafy vegetable and prevalence of anemia among women [10].

The dark green leafy vegetables are the main source for iron and vitamin A. Its consumption along with whole meal millet is considered as beneficial for women and lower the occurrence of anemia in them [14].

Consumption of F/C/M

Findings concluded no significant relationship between the consumption of meat and prevalence of anemia. Alcoholic beverages intake was found to be associated with reduced risk of anemia [7].

Findings reveal that consumption of Fish/Chicken/Meat is associated with reduced risk (11%) of anemia among women. [10].

Protein foods such as meat, poultry and fish increase the absorption of iron because they contain soy protein, phytic acid, polyphenols, and calcium. The intake of meat lowers the iron deficiency and act as a predictor of anemia [15].

Consumption of Alcohol

The alcoholic beverage is one of the reasons for lowering anemia as they are predictors of the hemoglobin in blood and depletion in iron storage in the body in most cases. [15].

Considering the literature review, many studies show how various factors act as determinants in prevalence of anemia. This study was conducted to find if exposure to media, TFR and nutrient habits affect anemia in Indian women.

So, Hypothesis formulated for the present paper after literature review are:

H1: Exposure to media and anemia

- There is no relationship between exposure to media and prevalence of anemia in women age 15-49
- There is a relationship between exposure to media and prevalence of anemia in women age 15-49

H2: TFR and anemia

- There is no relationship between TFR and prevalence of anemia in women age 15-49
- There is a relationship between TFR and prevalence of anemia in women age 15-49

H3: Consumption of DGLV and anemia

- There is no relationship between consumption of DGLV and prevalence of anemia in women age 15-49
- There is a relationship between consumption of DGLV and prevalence of anemia in women age 15-49

H4: Consumption of F/C/M and anemia

- There is no relationship between consumption of F/C/M and prevalence of anemia in women age 15-49
- There is a relationship between consumption of F/C/M and prevalence of anemia in women age 15-49

H5: Consumption of alcohol and anemia

- There is no relationship between consumption of alcohol and prevalence of anemia in women age 15-49
- There is a relationship between consumption of alcohol and prevalence of anemia in women age 15-49

METHODOLOGY

Data source

The data used for this research was extracted from NFHS-4. This research used secondary data of women (15-49 years) to conduct a cross sectional study using quantitative research approach.

The National Family Health Survey (NFHS) is a large-scale, multi-round survey conducted in a representative sample of households throughout India

The NFHS 4 fieldwork was conducted in India from 20 January 2015 to 4 December 2016 by 14 field agencies and collected data and other information using CAPI from approximately 601,509 households, 699,686 women, and 112,122 men. The data was gathered from all the different states of India. The survey provides state & national information for India on fertility, infant and child mortality, the practice of family planning, maternal and child health, reproductive health, nutrition, anaemia, utilization and quality of health and family planning services

Inclusion and Exclusion criteria

For this study, the data required was prevalence of anemia in all woman of age group 15-49(%), exposure to media (reads a newspaper/magazine at least once a week)(%), consumption of dark green leafy vegetables weekly (%), consumption of fish or chicken or meat daily (%) and consumption of alcohol(%).

All the Pregnant and Non pregnant women of states belonging to the reproductive age group (15 – 49 years) were included in the study. All the union territories of India are excluded due to non-availability of data. Moreover, children, men of all age group and women having age below 15 years and above 49 years were exempted from this study

Selection of Techniques

On performing literature review, most of the studies have used regression method, chi-square test on the secondary data. So, for this study Multiple Linear Regression method has been used on the data extracted from the NFHS-4 reports, which establishes a mathematical relationship among a number of random variables i.e.; this examines how multiple independent variables are related to one dependent variable.

To study the hypothesis formulated by regression method, dependent & independent variable was selected.

Dependent variable for the study was women (age 15-49) who are anaemic. It included both pregnant woman (<11.0 g/dl) (%) and non-pregnant woman (<12.0 g/dl) (%)

Independent Variable for the study were exposure to media (reads a newspaper/magazine at least once a week) (%), Total fertility rate, consumption of dark green leafy vegetables weekly (%), consumption of fish or chicken or meat daily (%) and consumption of alcohol (%).

MLR assumes that there should be no multicollinearity in the data, which occurs when the independent variables are highly correlated with each other. This can be checked by correlation matrix or Variance inflation factor (VIF).

All this estimation was done using Microsoft Excel 2010 & Minitab.

Data Analysis	Method	Objective
Inferential statistics	T-test	It is used to identify that those results are statistically significant or not by checking individual dependent variable with individual independent variable.
	ANOVA	This is used to determine that the result is statistically significant or not by checking combine dependent variable with independent variables.
	Multiple regression	This is used to check the significance by comparing dependent variable with multiple independent variables and the magnitude with which it affects the dependent variable.

Table 4. 1 Data Analysis Methods

RESULT

Data extracted from NFHS-4 was analysed using regression method by taking dependent variable as percentage of anaemic woman in different states of India with independent

variable as exposure to media (reads a newspaper/magazine at least once a week)(%), total fertility rate, consumption of dark green leafy vegetables weekly (%), consumption of fish or chicken or meat daily (%) and consumption of alcohol(%). Regression analysis was done on Microsoft Excel. From output summary, Adjusted R Square, beta-coefficient & p-value, and ANOVA results were considered to identify the relationship between dependent & independent variable.

Multiple Regression Analysis Results

The results of multiple regression analysis are shown in table 7 and table 8 of annexure. Data for the population of India (TABLE-7) on performing regression gives the following summary output which results that adjusted r-square is 0.485, 48% of the following variables affect the prevalence of anemia in Indian woman; still 52% of some other factors are there which affects prevalence of anemia. In another words this tells that 48% of variation in anemia in women can be explained by these independent variables. the total number of states taken for observations are indicated as 28. The multiple R value 0.7618 is in an acceptable range. Similarly, the factor F also has a significant value 0.0011.

Table 3 shows the p- value and beta value for different independent variables. P-value for exposure to media is 0.002 and for TFR is 0.314. Their beta coefficient values are -0.457 and -3.689 respectively.

P-value for DGLV, Fish/chicken/meat and alcohol consumption came out to be 0.016,0.535 and 0.042 respectively. Beta coefficient for DGLV is 0.335, for F/C/M is -0.084 and for alcohol consumption is -0.597

DISCUSSION

Data after analysis resulted that is 48% of variation in anemia in women can be explained by these selected independent. This means that 52% of some other factors are present which affects prevalence of anemia apart from these chosen independent variables.

Exposure to media ($p=0.002$; $p<0.05$), consumption of DGLV ($p=0.016$; $p<0.05$) and alcohol consumption ($p=0.04$; $p<0.05$) are significant whereas TFR ($p=0.314$; $p>0.05$) & F/C/M consumption ($p=0.535$; $p>0.05$) are not significant. This states that null hypothesis is rejected for exposure to media, consumption of DGLV and alcohol consumption.

Based on the result, analysis was done which showed that exposure to media should be increased by 0.457 unit ($\beta = -0.457$) that to decrease prevalence of anemia by 1 unit. Surprisingly, alcohol consumption ($\beta = -0.597$) should be increased by 0.084 to decrease prevalence of anemia by 1 unit. Moreover, consumption of DGLV ($\beta = 0.335$) should be decreased by 0.335 unit to decrease the prevalence of anemia by 1 unit.

Exposure to Media

The results indicate that women who are more exposed to media have less chance of being anemic i.e. exposure to media is significantly associated with prevalence of anemia. This depicts that women who are exposed to media might have more awareness, literacy and good socio-economic conditions which results in lower odds of anemia. Hence, the prevalence of anemia can be controlled easily by increasing awareness and education level among Indian women. Similar results were found in the study conducted by Annu Baranwal¹ and Nobhojit Roy [17].

Total Fertility Rate

The mean TFR value of the population studied is 2.1 and the highest TFR recorded is in state of Bihar which is 3.4. The analysis shows no significant association between TFR and prevalence of anemia in woman showing that an average TFR rate of 2.1 is not a concern. Our finding is in favor of study conducted by S. Gautam, H. Min, H. Kim and H. S. which also stated that TFR is not a significant factor of anemia [13]

Consumption of Dark Green Leafy Vegetables by Woman Weekly

The relation between consumption of dark green leafy vegetables by woman weekly and anemia is significant. Consuming dark green leafy vegetables increases the odds of anemia as per the analysis. The previous studies have shown that only consumption of DGLV is not

enough. It has to be accompanied with a balanced diet. This results also supports the research conducted by Wolfgang Stuetz and Victoria Goweke [14] [5].

Consumption of Fish/Chicken/Meat by Woman Weekly

The results reveal that there is no relation between consumption of meat/fish or chicken and anemia. This shows that combination of right proportion of food containing iron is required. This result is against the research carried out by Kathryn L. Beck and Rozanne Kruger [15]

Alcohol Consumption by a Woman

According to the result, surprisingly, the odds of anemia decreases on consuming alcohol. This association is true for a very small percentage of women with no data on the amount of alcohol consumed. Some confounding factors like good nutrition habits and high socio-economic status might have led to this result. This result also favors the research performed by Wabyahe Alenganisho and Pascal Magnussen [7].

CONCLUSIONS

Study results illustrated that exposure to media, consumption of dark green leafy vegetables and alcohol consumption are significant predictors for the prevalence of anemia among the women. The analysis showed that women exposed to media resources must have better awareness, literacy and socio-economic condition which is the reason of lower odds of anemia. Surprisingly, consumption of alcohol came to be a significant factor is lowering the odds of anemia confirming the presence of confounding factors like good diet and health practices. Moreover, consumption of green leafy vegetables is not enough alone, it needs to be supplemented with balanced diet. Specific interventions are required. Efficient and effective programs need to be implemented to increase literacy, awareness, improve socio-economic conditions and nutrition habits of women to combat anemia

Recommendations

The certain recommendations are

1. Public seminars should be arranged to make women aware of anemia and its causes.
2. Programs should address the need of iron fortification to reduce iron deficiency during pregnancy and childbearing
3. The people belonging to all state of India must be aware about anemia and its prevention with the help of media.
4. The consumption of dark green leafy vegetables should be taken along with other nutritious food by weak women of society.

Limitations

Linear regression has some limitations:

- They are sensitive to outliers, which would swing the final regression results & may result in inaccuracy or extrapolation in model.
- It is easy to over fit your model such that your regression begins to model the random error (noise) in the data, rather than just the relationship between the variables.
- This assumes the linearity between the dependent and independent variables of the data. In real-world data, it is not easily available for predicting the output because the dataset is rarely linear that can be separable.

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PART – B

COURSE REPORT ON

SIX SIGMA- GREEN BELT

INTRODUCTION

LEAN

Lean was developed in Toyota as part of the Toyota Production System, which was built around the work of Shewhart and Deming. Lean runs on the basis of elimination of wastes. In fact, the Lean methodology can be put as, "a set of tools that assist in the identification and the steady elimination of waste."

SIX SIGMA

Six Sigma was first developed at Motorola during the late 1980s. The goal was to upgrade the process on how the quality and measurement systems functioned. The Six Sigma methodology aimed on finding and removing anything that was source of variation in the process. When the variation is removed, the process results can be accurately forecasted. A system is to be designed so that the forecasted results fall under what customer is willing to accept and so to remove the errors.

LEAN AND SIX SIGMA

Lean Six Sigma is a blend of two constantly improvement oriented methods – Lean & Six Sigma, so as to make the way for better efficiency, and effectiveness within the process for organisations

Combining Lean & Six Sigma

Lean Six Sigma provides a structured appeal and a blended toolkit to assist employees construct their problem-solving skills. Lean & Six Sigma are based on the Scientific Method and together they assist the organizations eyeing to construct a

problem-solving environment. This means that “continuous improvement” becomes a routine

Two methods :

- Lean suggests the PDCA—Plan-Do-Check-Act/Adjust—method & tools like 5S 8 Wastes to attain constant improvement.
- Six Sigma applies the DMAIC— Define-Measure-Analyze-Improve-Control—method and tools like Control Charts and FMEA to attain efficiency and effectiveness

ATTITUDE AND DISCIPLINE

1. Customer Focus
2. Meet customer expectations every time

OPERATIONAL EXCELLENCE

Eighty-five percent of the reasons for failure to meet customer expectations are related to deficiencies in systems and processes, not to the fact that our employees are not up to the challenge

“The Manager's role is to promote process improvement.”

SIGMA LEVEL

Sr.No.	Sigma Level	DPMO- Defects Per Million Opportunities	Percentage of successful outputs or operations
1.	ONE	691,462	30.9
2.	TWO	308,538	69.1
3.	THREE	66,807	93.3
4.	FOUR	6,210	99.4
5.	FIVE	233	99.98

6.	SIX	3.4	99.99966
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Table (B) 1.1 Sigma Level

OBJECTIVE

- Learn how to understand the current process in statistical forms
- Applying Lean & six sigma method to improve any process and bring more efficiency & effectiveness in the current process

DMAIC: An Improvement Methodology

DMAIC ROADMAP

1. DEFINE: Set direction for improvement
2. MEASURE: Collect reliable data to understand current process performance
3. ANALYSE: Identify problem's root causes through process and data analysis
4. IMPROVE: Determine new improved process design
5. CONTROL: Ensure improvement effectiveness over time

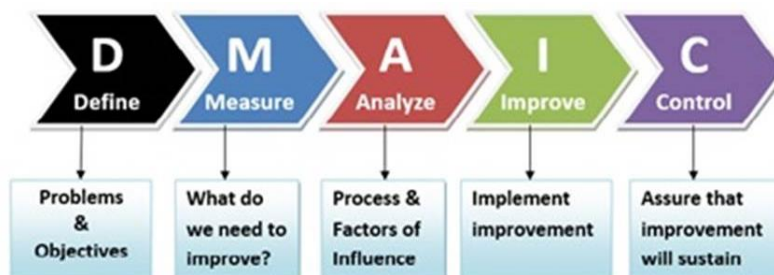


Fig. 3. 1 DMAIC Roadmap

DEFINE

Objectives: Set direction for improvement

Steps

- Have a high-level view of the process – SIPOC
- Know the customers' needs and identify their key performance requirements -CTQs
- Formalize the charter of the improvement project – Charter

MEASURE PHASE

Objective:

Collect reliable data to understand current process performance

95% of the population is within approximately ± 2 standard deviations of the mean

THE SIGMA OF A PROCESS

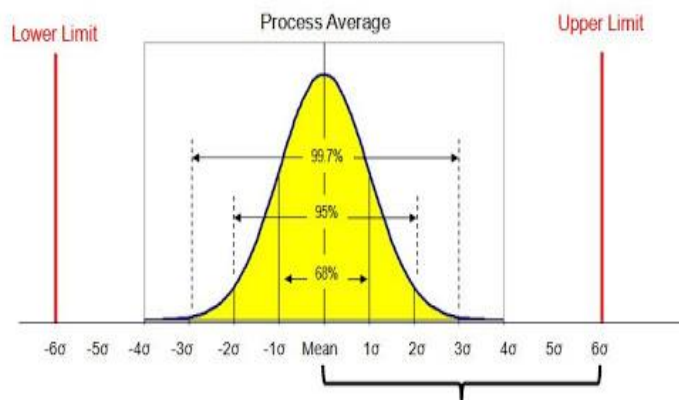


Fig. 5. 1 The Sigma of a process

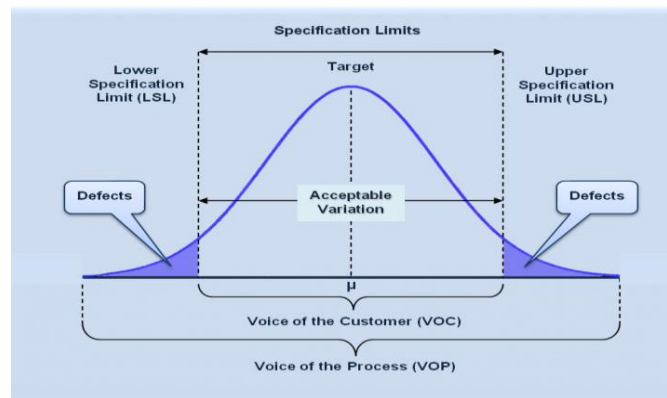


Fig. 5. 2 VOC and VOP

ANALYSE PHASE

Objective: Identify problem's root causes through process and data analysis

Steps:

1. Cause and Effect Diagram
2. Control Impact matrix
3. Pareto chart
4. Value analysis using process map

Cause and Effect Diagram-

A **Cause and Effect Diagram** is a graphical tool for displaying a list of causes associated with a specific effect. It is also known as a fishbone diagram or an Ishikawa diagram (created by Dr. Kaoru Ishikawa, an influential quality management innovator).

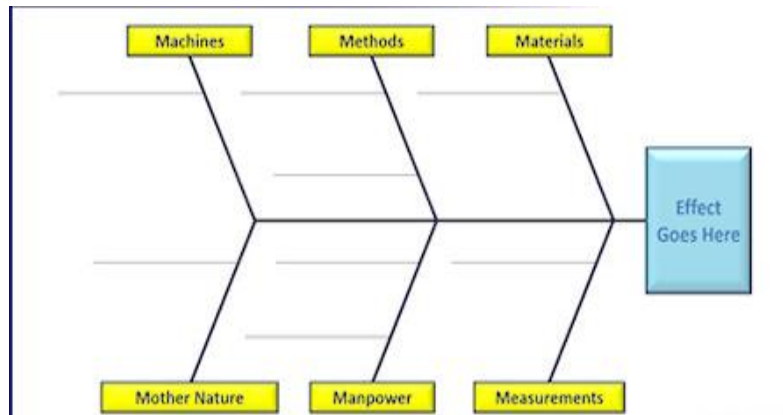


Fig. 6. 1 Cause & Effect diagram

CONTROL IMPACT MATRIX

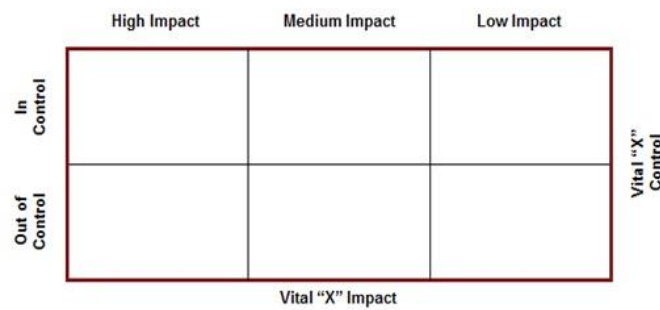


Fig. 6. 2 Control Impact Matrix

Pareto chart

A tool to graphically represent the discrete data in categories and identify the few causes basic to most of the defects (the 80 / 20 principle)

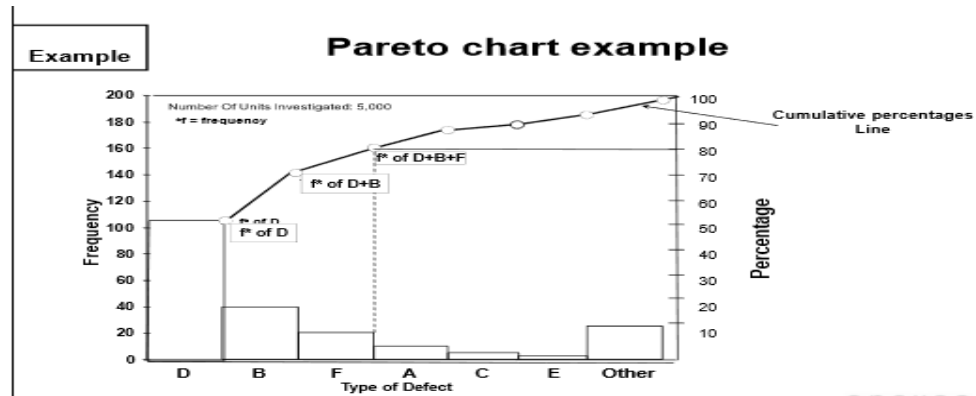


Fig. 6. 3 Pareto Chart

PROCESS MAP

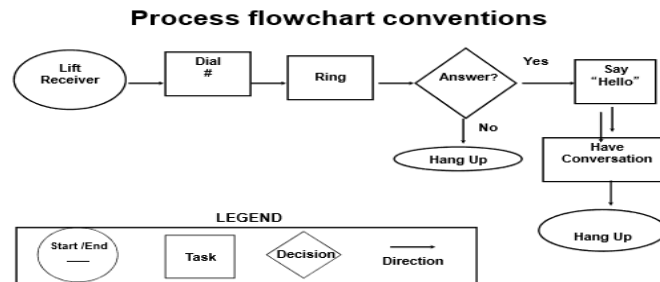


Fig. 6. 4 Process Flowchart

7 (8) Wastes (Muda)

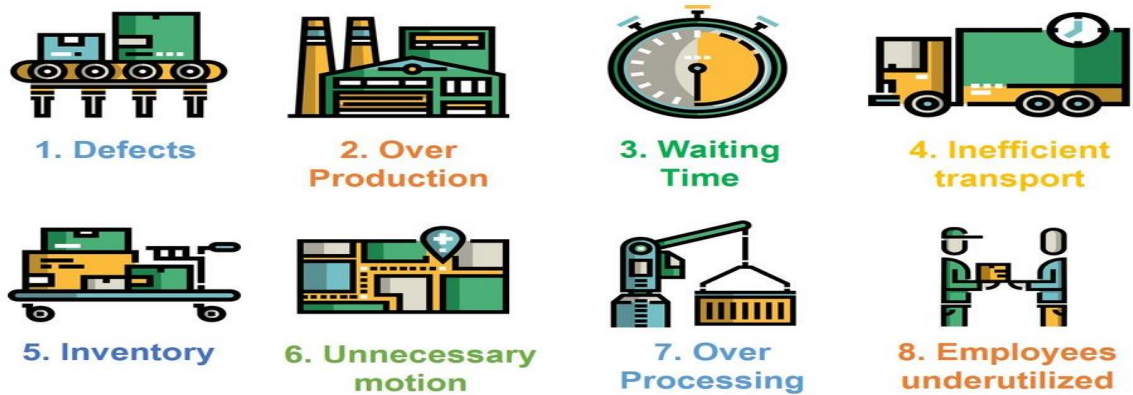


Fig. 6. 5 Types of waste (Muda)

Improve Phase

Objective

Determine new improved process design

Steps:

Generate solutions Select and test solutions

Idea Generation

Creativity approaches

1. **Process benchmarking**
2. **Best practices**
3. **Brainstorming**

Control Phase

Objective: Ensure improvement over time

Steps:

- Create control tools (documentation and dashboard)
- Organize process reviews by Process Owner

The CONTROL phase naturally leads to Process Management as the purpose of that phase is to deliver the tool set for ongoing management of the process performance by Process Owner.

CONTROL = implement process management

Five S

- Sorting -Selecting or separating
- Simplifying -Straighten and store
- Sweeping- Scrub and shine
- Standardizing
- Self-discipline -Systematize

Learning Methodology

Live video classes, followed by one case study analysis and final online exam for certification

Key Learnings

Benefits of Using Lean Six Sigma

Organizations face rising costs and new challenges every day. Lean Six Sigma provides a competitive advantage in the following ways:

- How to define the current process
- Converting variables/feedbacks into measurable terms
- Analyze the data using statistical tools
- Finding solutions to improve the existing process
- Sustaining and keep a check on the improved process

Fully Executing Lean & Six Sigma methods from Green Belt perspective to improve a process being followed in any organization

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Awarded to

SHILPA SINGH

for successfully completing
Lean and Six Sigma Green Belt during
May 2020; passing the examination conducted by
Anexas Europe and getting certified as Green Belt
by demonstrating adequate competence in application
of Lean Six Sigma tools and techniques.

Amitabh Saxena
CEO

May 25, 2020

Certificate No. GBIND160520/1606/21

Annexures

STATES	Anemia in woman	exp to media	TFR	DGLV consumption	Fish/Chi cken/Me at	Alcohol Consumption
Andhra Pradesh	60	28.3	1.8	64.3	1.7	0.4
Arunachal Pradesh	43.2	11.7	2.1	24.2	8.4	26.3
Assam	46	12.2	2.2	29.5	13.5	6.9
Bihar	60.3	15.6	3.4	27.9	1.1	0.2
Chhattisgarh	47	19.3	2.2	26.2	0.7	5
Goa	31.3	30.87	1.7	47.4	42.8	4.2
Gujrat	54.9	29.4	2	29.6	1.3	0.3
Haryana	62.7	35.1	2.1	54.4	0.6	0.1
Himachal Pradesh	53.5	36.4	1.9	32	0.4	0.3
Jharkhand	65.2	16.4	2.6	41.6	0.8	4.1
Karnataka	44.8	34.8	1.8	19.6	6.2	1
Kerala	34.3	77.4	1.6	54	65	1.6
MP	52.5	21.7	2.3	40.9	0.6	1.6
Maharashtra	48	34.9	1.9	46.8	2.4	0.2
Manipur	26.4	41.1	2.6	23.3	20.4	6.1
Meghalaya	56.2	31.3	3	36.7	13.1	2.1
Mizoram	24.8	63.3	2.3	17.2	3.3	5
Nagaland	27.9	27.9	2.7	37.3	6.8	3.3

Odisha	51	18.6	2.1	14.2	2	2.4
Punjab	53.5	31.9	1.6	30.1	0.2	0.1
Rajasthan	46.8	22.3	2.4	44.2	0.3	0.1
Sikkim	34.9	26.1	1.2	13.6	2.7	23
Tamil Nadu	55	31.8	1.7	33.3	4.7	0.4
Telangana	56.6	47.4	1.8	64.8	1.8	8.7
Tripura	54.5	16.5	1.7	36.1	11.3	4.8
Uttar Pradesh	52.4	32.7	2.7	43.1	0.7	0.2
Uttrakhand	45.2	19.3	2.1	40	0.8	0.3
West Bengal	62.5	18	1.8	30.4	28.7	0.8

Table 1 Percentage Distribution of Socioeconomic and Lifestyle Factors

Comparative Study: comparing present paper findings with literature review

Hypothesis H1				
Exposure to Media				
Exposure to media does affect the prevalence of anemia in women of age 15 – 49 years				
S.No	Year	Title	Conclusion	Results of present study
1.	2015	Identifying risk factors of anemia among women of reproductive age in Rwanda – a cross-sectional study using secondary data	Findings showed that there is no significant relationship between exposure to media and prevalence of anemia among women	Present study showed a significant relationship between the exposure to media and prevalence of anemia. It revealed that with more exposure to

		from the Rwanda demographic and health survey 2014/2015		media the risk of anemia among women of age 15-49 reduces
2.	2015	Burden of Anaemia among Women in Jharkhand, India: Does Lifestyle Behaviour Matters?	There is no significant relationship between exposure to media and prevalence of anemia among women	Present study doesn't agree with the same.
3.	2017	Prevalence of Anemia and Its Determinants Among Pregnant, Lactating, and Nonpregnant Nonlactating Women in India	Findings of the study revealed that with an increase in exposure to media, the risk of anemia reduces among the non-pregnant & pregnant women	Present study supports previous study i.e. the exposure to media among women and prevalence of anemia are negatively associated

Table 2 Comparing present paper findings with literature review for exposure to media

Hypothesis H2				
Total Fertility Rate				
Total fertility rate does affect the prevalence of anemia level in women of age 15 – 49 years				
S.No	Year	Title	Result	Results of present study
1.	2006	Risk factors for anemia in Veitnam	Results concluded that having more than 3 children increases the risk of anemia among women compared to the women having lesser number of children	Present study does not support this finding and reveals no significant association between number of children and anemia prevalence

				among women of age 15-49
2.	2019	Determining factors for the prevalence of anemia in women of reproductive age in Nepal: Evidence from recent national survey Data	Found no statistically significant relationship between number of children and prevalence of anemia among women	Present study is in-line with the results. No relationship is found between the predictor variable TFR & outcome variable anemia amongst women aged 15-49
3.	2013	Risk factors associated with anemia among Serbian non-pregnant women 20 to 49 years old. A cross-sectional study	Findings concluded that higher parity increases the risk of anemia among women	Present study does not support the findings. It concludes no significant relationship between TFR and prevalence of anemia among women aged 15-49
4.	2017	Prevalence of Anemia and Its Determinants Among Pregnant, Lactating, and Nonpregnant Nonlactating Women in India	The results of this study concluded a significant relationship between Parity and prevalence of anemia. It was found that Higher Parity reduces the risk of anemia	Present study has shown no significant relationship between Parity and anemia among women of age 15-49

5.	2015	Identifying risk factors of anemia among women of reproductive age in Rwanda – a cross-sectional study using secondary data from the Rwanda demographic and health survey 2014/2015	The effect of number of children on prevalence of anemia was found insignificant. No. of children ever born was not found to be a predictor for anemia in women	Present study also supports that fact that TFR does not affect the prevalence of anemia in women of age 15-49
6.	2015	Burden of Anaemia among Women in Jharkhand, India: Does Lifestyle Behaviour Matters?	Results concluded that women with more children are more prone to be anemic as compared to women with lesser number of children	Present study doesn't agree with this result, our study has shown no relation between number of children and prevalence of anemia

Table 3 Comparing present paper findings with literature review for TFR

Hypothesis H3				
Consumption of Dark Green Leafy Vegetables				
Consumption of dark green leafy vegetable by women weekly does affects the prevalence of anemia in women of age 15 – 49 years				
S.No	Year	Title	Conclusion	Results of present study

1.	2018	Effect of green leafy vegetables powder on anaemia and vitamin-A status of Ghanaian school children	Results revealed that consumption of green leafy vegetable powder increases mean hemoglobin i.e. reduces the risk of anemia	Present study disagrees the same. It found positive association between the consumption of DGLV and risk of anemia
2.	2006	Prevalence of anaemia among adolescent girls in the urban slums of Vellore, south India	Study does not find any significant association between the consumption of green vegetables and the prevalence of anemia	Present study shows significant Association between prevalence of anemia in woman and consumption of DGLV
3.	2015	Burden of Anaemia among Women in Jharkhand, India: Does Lifestyle Behaviour Matters?	Study found that with increase in consumption of DGLV the risk of anemia among women increases	Present study also supports the finding that with increase in intake of DGLV, prevalence of anemia increases.
4.	2011	Addressing Female Iron-Deficiency Anaemia in India: Is Vegetarianism the Major Obstacle?	Study does not find any significant relationship between consumption of green leafy vegetable and prevalence of anemia among women	Present study shows significant Association between prevalence of anemia in woman and consumption of DGLV

5.	2013	Risk factors associated with anemia among Serbian non-pregnant women 20 to 49 years old. A cross-sectional study	Study finds a significant relationship between green vegetables consumption and prevalence of anemia among women. It was found that with less intake of green vegetables the risk or prevalence of anemia increases	Present study disagrees the same. It found positive association between the consumption of DGLV and risk of anemia
6.	2019	Consumption of Dark Green Leafy Vegetables Predicts Vitamin A and Iron Intake and Status among Female Small-Scale Farmers in Tanzania	In terms of body weight, hemoglobin, vitamin A and iron status, a monotonous but micronutrient-rich diet with wholemeal millet and DGLV was advantageous over a diet consisting mainly of polished maize or rice and insufficient amounts of basically more readily available fruits and DGLV	This study support previous study, the relation between consumption of dark green leafy vegetables by woman weekly and anemia is positive as well as supportive. The beta value is 0.335 and P value is 0.016. This relation indicates that when the consumption of dark green leafy vegetables is increased the among woman belonging to reproductive age group then the risk of anemia also increases

Table 4 Comparing present paper findings with literature review for consumption of DGLV

Hypothesis H4				
Consumption of Fish/Chicken/Meat				
Consumption of fish/chicken/meat by women weekly does affect the prevalence of anemia in the age of 15 – 49 years				
S.No	Year	Title	Conclusion	Results of present study
1.	2012	Anemia and risk factors among female secondary students in the Gaza Strip	Association between meat consumption and anemia was found negative. With increase in consumption of meat the risk of anemia is found to be reduced	Present study does not show any relationship between the predictor variable F/C/M consumption and prevalence of anemia among women of age 15-49
2.	2006	Prevalence of anaemia among adolescent girls in the urban slums of Vellore, south India	Study found that with reduced consumption of meat the risk of anemia increases among adolescent girls	Present study does not find any relationship between F/C/M consumption and risk of anemia
3.	2011	Addressing Female Iron-Deficiency Anaemia in India: Is Vegetarianism the Major Obstacle?	Findings reveal that consumption of Fish/Chicken/Meat is associated with reduced risk (11%) of anemia among women	Present study does not found any association between consumption of Fish/Chicken/Meat and prevalence of anemia among women of age 15-49

4.	2007	Intake of Alcoholic Beverages Is a Predictor of Iron Status and Hemoglobin in Adult Tanzanians	Findings concluded no significant relationship between the consumption of meat and prevalence of anemia	Present study also reveals the same, i.e. there is no association between consumption of fish/chicken/meat and prevalence of anemia
5.	2006	Risk factors for anemia in women	Findings revealed lower meat consumption is associated with increased risk of anemia among women compared to women having more consumption of meat	Present study disagrees with these findings. Present study does not find any association between fish/chicken/meat consumption and risk of anemia among women of age 15-49
6.	2013	Risk factors associated with anemia among Serbian non-pregnant women 20 to 49 years old. A cross-sectional study	Findings were, with lower meat consumption the risk of anemia increases among women compared to women with more consumption of meat	Present study does not find any significant relationship between consumption of fish/chicken/meat and prevalence of anemia among women of age 15-49

Table 5 Comparing present paper findings with literature review for consumption of F/C/M

Hypothesis H5				
Alcohol Consumption by a Woman				
Consumption of alcohol by women weekly does affect the prevalence of anemia in the age of 15 – 49 years				
S.No	Year	Title	Conclusion	Results of present study
1.	2007	Intake of Alcoholic Beverages Is a Predictor of Iron Status and Hemoglobin in Adult Tanzanians	Alcoholic beverages intake was found to be associated with reduced risk of anemia	Present study shows that with increase in alcohol consumption there is reduced risk of anemia among women of age 15-49
2.	2004	The Effect of Alcohol Consumption on the Prevalence of Iron Overload, Iron Deficiency, and Iron Deficiency Anemia	Results concluded that with increased alcohol consumption (upto 2 drinks per day) is associated with reduced risk of anemia	Present study also reveals the association that with increase in alcohol consumption the risk of anemia among women of age 15-49 decreases
3.		Risk factors associated with anemia among Serbian non-pregnant women 20 to 49 years old. A cross-sectional study	Study concluded a statistically significant relationship between alcohol consumption and prevalence of anemia. It found that with increase in consumption of alcohol, the risk of anemia decreases among women	Present study is in-line with the result that with increase in alcohol consumption there is reduced risk of anemia among women of age 15-49

4.	2007	Intake of Alcoholic Beverages Is a Predictor of Iron Status and Hemoglobin in Adult Tanzanians	Depleted iron stores and anemia were widespread in the 2 communities in and around Lake Victoria. Depleted iron stores were more common among females but did not explain the lower hemoglobin in women. Deficiencies of other micronutrients essential to erythropoiesis or to utilization of iron for erythropoiesis e.g. B vitamins, vitamin A, and zinc may explain some of the 13-g/L hemoglobin sex difference, although most may reflect the genuine sex difference. Other studies have reported sex differences in iron status or hemoglobin not likely explained by differences in dietary intake, growth, and infections	This study support previous study, The study results reveal that there is a negative relationship with anemia. This means that when the women consume alcoholic beverages then this will result in lowering the odds of anemia.
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Table 6 Comparing present paper findings with literature review for consumption of Alcohol

<i>Regression Statistics</i>	
Multiple R	0.7618
R Square	0.5803
Adjusted R Square	0.4849
Standard Error	8.1702
Significance F	0.0011
Observations	28.0000

Table 7 Multiple Regression Statistics

	<i>Coefficients</i>	<i>St Error</i>	<i>t Stat</i>	<i>P-value</i>
Intercept	61.248	10.708	5.720	0.000
Exposure to media	-0.457	0.129	-3.547	0.002
TFR	-3.689	3.579	-1.031	0.314
Dark green leafy vegetable	0.335	0.128	2.623	0.016
Fish/Chicken/Meat	-0.084	0.133	-0.630	0.535
Alcohol Consumption	-0.597	0.276	-2.161	0.042

Table 8 Multiple Regression Analysis

	<i>Df.</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>
Regression	5	2030.6962	406.1392	6.0843	0.0011
Residual	22	1468.5481	66.7522		
Total	27	3499.2443			

Table 9 ANOVA Test Analysis

	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>
Intercept	61.248	10.708	5.720	0.000	39.04	83.45
Exp to media	-0.457	0.129	-3.54	0.002	-0.724	-0.190
TFR	-3.689	3.579	-1.03	0.314	-11.11	3.732
Dark green leafy vegetable Women	0.335	0.128	2.623	0.016	0.070	0.600
Fish/Chicken/Meat	-0.084	0.133	-0.63	0.535	-0.359	0.192
Alcohol consumption	-0.597	0.276	-2.16	0.042	-1.170	-0.024

Table 10 Sample T-test

	<i>Coefficients</i>	<i>St Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Vif value</i>
Intercept	61.248	10.708	5.720	0.000	
Exposure to media	-0.457	0.129	-3.547	0.002	1.70
TFR	-3.689	3.579	-1.031	0.314	1.18
Dark green leafy vegetable	0.335	0.128	2.623	0.016	1.21
Fish/Chicken/Meat	-0.084	0.133	-0.630	0.535	1.56
Alcohol Consumption	-0.597	0.276	-2.161	0.042	1.24

Table 11 VIF Values