AN EXPLORATORY DATA ANALYSIS ON HAPPINESS INDEX OF SDM TEACHING FACULTY

Project Report submitted

SDM COLLEGE (Autonomous)

in partial fulfilment of the degree of

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IN

STATISTICS

Submitted by

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CERTIFICATE

Certified that this is the bonafide record of project work done by Mr.Arvind N Myageri during the year 2018 as a part of her M.Sc (Statistics) Third semester course work.

Reg. No.	1	8	1	7	0	8

Project Guide

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Place: Ujire

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DECLARATION

We, hereby declare that the matter embodied in this report entitled “An Exploratory Data Analysis on Happiness Index of SDM Teaching faculty” is a bonafide record of project work carried out by me under the guidance and supervision of Asst Prof Mr. Pradeep K Department of Statistics, SDM College, Ujire - 574240, Karnataka, India.

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(Arvind N Myageri)

Contents

1.Introduction

1.1 Introduction:

The world is a rapidly changing place. Among the fastest changing aspects are those relating to how people communicate and interact with each other, whether in their schools and workplaces, their neighbourhoods, or in far-flung parts of the world.

Being happy is one of the most fundamental requirements of a living being. Since the beginning of the human civilization, man has also been trying to develop new technologies, make new tools and improve his lifestyle for the sole purpose of attaining happiness. However, in its race of scientific endeavor and pursuit of money and luxuries, man is hardly aware of what exactly constitutes happiness.

Happiness is defined as the state in which a living being expresses pleasure and contentment. It is the state in which negative stress levels are at the lowest, even if not zero and positive stress boosts the person's positive emotions.

Happiness is a non-tangible entity that cannot be found in luxuries and riches. Although materialistic entities can boost our happiness levels, but only for a short-term. It is the state of mind and our perceptions that shape our idea about happiness and determines our contentment level too.

It is very important to measure one's happiness. Without proper measurement, it is almost impossible to determine if one is getting happier in life or not. Everyone has a different way to measure happiness.

Happiness is so much wanted by everyone that it is natural for people to develop misconceptions about it. Happiness is not always what we think of what it is because our perceptions and experiences with the world mold our opinion of happiness and at times, we develop delusions regarding happiness. Let us now go through the common fallacies that man has with regards to the concept of happiness.

Misconception 1: Suppressing negative emotions

Happiness is certainly not about suppressing one's emotions, especially the negative ones. Happier people on the earth are as vulnerable to sad moments and moments of dejection and grief as anyone else in the world is. However, what matters is what a person does with those moments and how he or she responds to them that defines happiness levels. Happier people have been found to focus more on the solutions, rather than the problem and this is what makes them happier than others. If an individual tries to suppress his negative emotions, those emotions will keep eating him and hollowing him from inside

Misconception 2: Happiness is all about goals

It is a common adage that the ‘journey matters more than the destination’. It is important to have goals in life. However, goals are not the only things that make us happy. Only accomplishment of goals does not make an individual happy.

Most of the people in the world think that once goals are achieved, they will be happy. However, it is the struggle in the accomplishment that makes the human being happy.

1.2 Objectives

- Effect of marital status on happiness index
- To determine the independence of attributes using χ^2 test
- Effect of Living standard satisfaction on happiness index
- Effect of Interpersonal relationship with colleagues on happiness index
- Effect of overall happiness health on happiness Index

2. PREPARATION OF QUESTIONNAIRE

A primary data has been collected through a survey conducted in various colleges of SDM Institution, Ujire. The data is collected through questionnaire. Keeping in mind the objectives, and the happiness of the staffs, a questionnaire was designed.

A sample of 90 staff was taken from different S.D.M colleges in Ujire using simple random sampling.

Collection of data : The teams went on collection of data randomly from different S.D.M colleges in Ujire.

3 Methodology:

'R' language has been used to carry out the analysis and the interpretation of the data. The statistical methods considered in order to carry out the analysis are given as follows:

3.2 Graphical Techniques:

1. Box plot:

   The box plot (a.k.a. box and whisker diagram) is a standardized way of displaying the distribution of data based on the five number summary: minimum, first quartile, median, third quartile, and maximum. In the simplest box plot the central rectangle spans the first quartile to the third quartile (the inter quartile range or IQR). A segment inside the rectangle shows the median and "whiskers" above and below the box show the locations of the minimum and maximum.

2. Normal Quantile-Quantile (Q-Q) Plot:
   - **qqnorm() in R :** It is a generic function and is used for testing the normality of a sample. It produces a normal Q-Q plot of the values in y.
   - **qqline() in R :** This function adds a line to a theoretical, by default normal Q-Q plot, which passes through the probability quantiles, by default the first and third quartiles.
   - If the data set is normally distributed, then the data points should fall along the line produced by the qqline() command.
3. Scatter Plot:

   A scatter plot is a two-dimensional data visualization that uses dots to represent the values obtained for two different variables - one plotted along the x-axis and the other plotted along the y-axis. Scatter plots are used when you want to show the relationship between two variables. Scatter plots are sometimes called correlation plots because they show how two variables are correlated

3.3 Kruskal-Wallis Test:

The Kruskal-Wallis test is a nonparametric (distribution free) test. It is used when the assumptions of one-way ANOVA are not met. Both the Kruskal-Wallis test and one-way ANOVA assess for significant differences on a continuous dependent variable by a categorical independent variable (with two or more groups).

In the ANOVA, we assume that the dependent variable is normally distributed and there is approximately equal variance on the scores across groups. However, when using the Kruskal-Wallis Test, we do not have to make any of these assumptions. Therefore, the Kruskal-Wallis test can be used for both

continuous and ordinal-level dependent variables. However, like most non-parametric tests, the Kruskal-Wallis Test is not as powerful as the ANOVA.

Null hypothesis: Null hypothesis assumes that the samples (groups) are from identical populations.

Alternative hypothesis: Alternative hypothesis assumes that at least one of the samples(groups) comes from a different population than the others.

In R, we can use kruskal.test() for Kruskal-Wallis test.

3.4 Chi- Square Test for Independence of Attributes:

The Chi-Square test of independence is used to determine if there is a significant relationship between two nominal (categorical) variables. The frequency of

each category for one nominal variable is compared across the categories of the second nominal variable. The data can be displayed in a contingency table where each row represents a category for one variable and each column represents a category for the other variable.

Hypothesis:

Null hypothesis: Assumes that there is no association between the two variables.

Alternative hypothesis: Assumes that there is an association between the two

variables.

The test-statistic is given as follows: $\chi 2 = X(O-E)2\ E$ where,

• O represents observed frequency • E is the expected frequency under the null hypothesis, and is computed as follows :

E =row total×column /total sample size

The expected frequency count for each cell of the table must be atlest 5. The test procedure is to reject null hypothesis H0 if $\chi 2 > \chi 2\ \alpha,(r-1)(c-1)$ where $\chi 2\ \alpha,(r-1),(c-1)$ is the upper αth percentile value of central $\chi 2$ distribution with (r-1)(c-1) degrees of

freedom, r is the number of rows, and c is the number of columns.

p-value can also be used to draw conclusion about the test. If the p-value is less

that 0.05 then reject the null hypothesis H0 and accept the alternative hypothesis H1.

4. Results and Discussions

4.1 Descriptive Analysis:

College	No. of responses	Percentage of responses	Avg work experience
SDM IT	30	33.33%	9.28
SDM BNYS	2	2.22%	3
SDM Degree	15	16.67%	8.76
SDM PG	23	25.56%	9.08
SDM POLYTECHNIC	20	22.22%	5.85
TOTAL	90	100%	5.97

4.2 Effect of marital status on happiness index

We determine whether there is any effect of marital status on happiness.

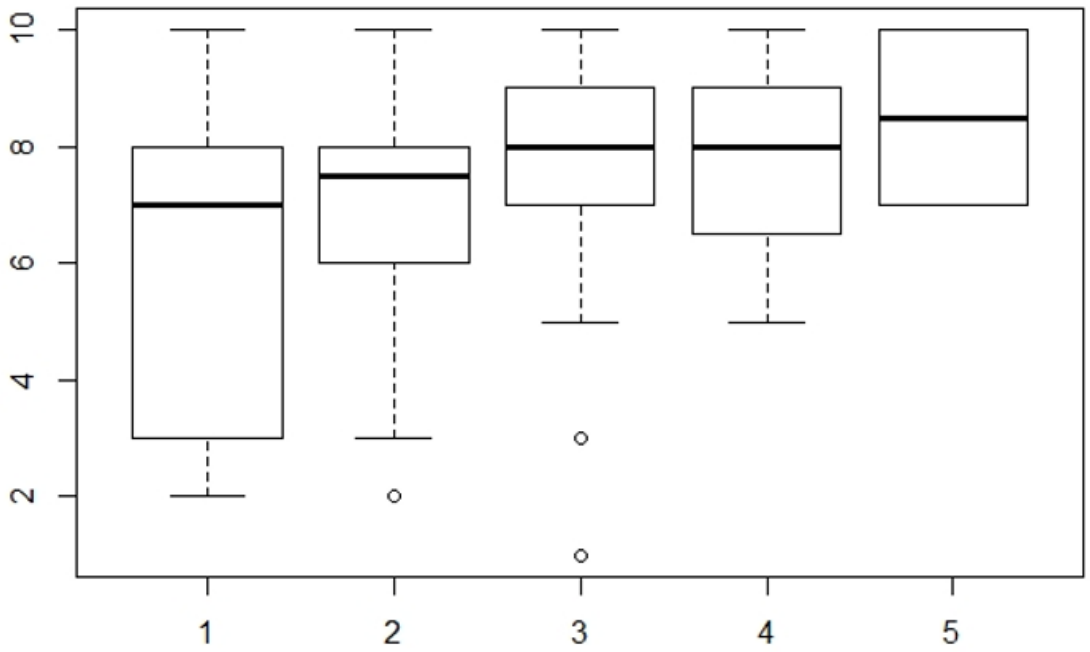
For this purpose we use Kruskal-Wallis test.

Here, the hypothesis are given by

H_0: There is no significant difference between the medians.

H_1: There is significant difference between the medians.

Kruskal-Wallis rank sum test



Kruskal-Wallis chi-squared = 12.701, df = 9, p-value = 0.1766

Result: Here we can observe that the p value is 0.1766 and from the graph also we can conclude that medians are almost same. Therefore marital status do not affect the happiness of people.

4.3 Chi-Square test for independence of Attributes:

1) To test whether gender of an individual is independent of being optimistic

about future.

H0 : The two variables are independent of each other.

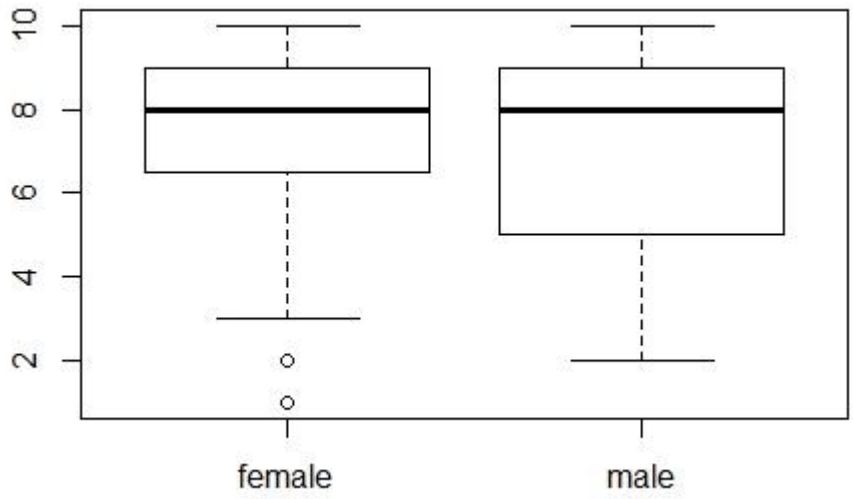
H1 : The two variables are dependent of each other.

	Optimistic about Future		Total
Gender	Yes	No	
Female	26	2	28
Male	53	7	60
Total	79	9	89

$\chi 2$ 1=0.07544 and p-value=0.7836 Since p-value > 0.05 do not reject the null hypothesis.

Hence it can be concluded that gender and being optimistic about future are independent.

4.4 Effect of Interpersonal relationship with colleagues on happiness index



We determine whether there is any effect of Interpersonal relationship with colleagues on happiness.

For this purpose we use Kruskal-Wallis test and we use Pearson correlation method to check co relation between them.

Pearson correlation method

Pearson's product-moment correlation

data: Q13 and Q6.1
t = -0.42711, df = 87, p-value = 0.6704
alternative hypothesis: true correlation is not equal to 0
95 percent confidence interval:
 -0.2516031 0.1640766
sample estimates:
       cor
-0.04574319

The correlation between the two variables is about -0.04

Kruskal-Wallis test

Kruskal-Wallis rank sum test

data: Q13 and Q6.1
Kruskal-Wallis chi-squared = 11.46, df = 9, p-value = 0.2455

Result:

Here the p-value is greater than 0.05 therefore there is no significant difference in median and hence Interpersonal

relationship with colleagues do not affects the happiness of people.

4.5 Effect of Overall health on happiness index

We determine whether there is any effect of Overall health on happiness.

For this purpose we use Kruskal-Wallis test and we use Pearson correlation method to check co relation between them.

Pearson correlation method

Pearson's product-moment correlation

data: Q6.5 and Q6.1

t = 10.499, df = 87, p-value < 2.2e-16

alternative hypothesis: true correlation is not equal to 0

95 percent confidence interval:

0.6387961 0.8270836

sample estimates:

cor

0.7475973

The correlation between the two variables is about 0.74

Kruskal-Wallis test

Kruskal-Wallis rank sum test

data: Q6.5 and Q6.1

Kruskal-Wallis chi-squared = 45.564, df = 9, p-value = 7.255e-07

Result:

Here the p-value is less than 0.05 therefore there is significant difference in mea and hence Overall health affects the happiness of people. As Overall healthincreases happiness also increases.