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R. B. Narayanrao Borawake College, Shrirampur

DEPARTMENT OF STATISTICS

A Project Report on,

"Statistical Analysis of daily Exercise Habits and its role in Stress Reduction".

Submitted by : Asane Prashant Devkisan

Academic Year 2023-2024

Education through self - help is our motto" - KARMAVEER

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CERTIFICATE

ST 369: PROJECT

Date:12/02/2024

This is certify that Mr.Asane Prashant Devkisan , a student of B. Sc. Statistics has satisfactorily completed the project on **"Statistical Analysis of daily Exercise Habits and its role in Stress Reduction"** during the academic year 2023-24.

Teacher In charge Examiner Head of Department

IMPORTANCE OF STATISTICAL PROJECTS

The field of Statistics is the science of learning from data. Statistical knowledge helps you use the proper methods to collect the data, employ the correct analysis, and effectively present the results. Statistics is a crucial process behind how we make discoveries in science, make decisions based on data, and make predictions. Statistics allows you to understand a subject much more deeply.

Statistical project is the best process of answering the research question using statistical terminologies and techniques. It also helps us to present the work written in the given report. In statistical projects, the research could be on scientific or generic fields such as advertising, nutrition, and lots more. Therefore the difficulty level of statistical projects varies with research topics. And the statistics concepts also differ from one case to another.

ACKNOWLEDGEMENT

In the present world of competition there is a race of existence in which those are having will to come forward succeed. Project is like a bridge between theoretical and practical working. With this willing I have joined this particular project. First of all, I would like to thank the supreme power of Almighty god is obviously the one has always guided us to work on the right path of life. Without this grace this project could not become a reality.

I am feeling oblige in taking the opportunity to sincerely thanks to Dr. P .V . Badadhe Sir (Principal R. B. Narayanrao Borawake College, Shrirampur) and special thanks to my worthy head of Department Dr. S. K. Khilare Sir. I am highly obliged in taking the opportunity to sincerely thanks to Prof. A. S. Mhetras Mam for their generous attitude and friendly beheviour. And also, thanks to
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THANKS……

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ABSTRACT

A statistical survey is done to study the effect of doing exercise on the mental health or mental stress of an individual with the help of factors like type of exercise, weight of an individual, residential area, age of individual. The mode of data collection used in a project is online and 404 responses were collected using google form. Dependence of attributes and proportion tests are done with the help of R-software.

The conclusion that we draw is people felt relief from the mental stress after doing some kind of exercises. Almost 61.8 percent people indulged in different kind of exercise daily and almost 23.9 percent does exercise but not on a regular basis.

Key- Words :chi-square test, test of proportion

INTRODUCTION

In this fast growing world we started ignoring our health, and one of the important aspect of health is mental health. Mental health refers to our emotional, psychological, and social well-being. It includes how we think, feel, behave, etc. It is very important to handle stress and to maintain a good mental health which is important for individual's life.

If we are not able to manage stress then it will lead to some severe health conditions like Depression, Anxiety, panic which could be life threatening. So, one of the popular way to manage stress is to do exercise. That's why in this project we have tried to check the effectiveness of exercise in the stress management and better mental health for well-being of one's life.

There are various kinds of exercises like physical exercise, yoga, meditation, etc. according to research yoga and meditation comparatively have better effects on mental health than the physical exercises. We have tried to analyze that are people missing out these kind of exercises which are extra effective due to lack of awareness in their residential area. With the conclusions that we have drawn through our project we may able to sort this issue.

OBJECTIVES

- To study the correlation between regular exercise and reduced stress level.
- To check whether the relation between weight and exercise.
- To study which exercise activity is more preferable.
- To analyze which age group involved more in daily exercise.
- To study the effectiveness of Daily exercise performance on health of people.

QUESTIONNARIE

1) What is your name?

2) What is your Area of Residence?

3) Which age group do you belong?

4) What is your weight?

5) What is your height?

6) Do you exercise daily?

i) Yes ii) No iii) Maybe

7) What type of exercise activities do you participate in regularly?

i) Physical exercise ii) Yoga iii) Meditation iv) Other

8) How much time do you give for exercise daily?

i) Half hour ii) One hour iii) Two hour iv) More than two hours

9) Is exercise helps you in reducing stress in your daily life?

i) Yes ii) No

10) Which time slot do you prefer for exercise?

i) Morning ii) Afternoon iii) Evening

11) Have you noticed changes in your stress levels on day when you exercise compared to day when you don't?

i) Positive change ii) Negative change iii) No change

12) Have you ever participated in meditation or mindfulness exercise to manage stress?

i) Yes ii) No

13) Do you prefer exercising alone or in a group setting?

i) Alone ii) In group

14) How do you feel emotionally after completing work out session?

i) Tired ii) Fresh iii) Energetic

15) Does exercise helps to reduce your stress levels or not?

i) Yes ii) No

16) Are there any specific exercise activities that you find more effective in reducing stress than others?

i) Meditation ii) Yoga iii) Physical Exercise

17) Do you use any fitness app to track your exercise records?

i) Smart Watch ii) Fitness App iii) Both iv) Nothing

18) Have you ever felt any effect on your sleep cycle due to heavy exercise?

i) Good Effect ii) Bad Effect iii) No effect

19) Have you ever experienced any negative impact on your physical health due to prolonged exercise?

i) Yes ii) No

20) Do your workload interfere your daily exercise habits?

i) Yes ii) No

21) Do you feel that your exercise habits have influenced your dietary choice and overall nutrition?

i) Yes ii) No

22) What is your motivation to do daily exercise?

i) Physical Health ii) Attractive looks iii) For Professional purpose

23) How effective exercise is in reducing your stress?

i) Not Effective ii) Very Effective

24) Is there is correlation between regular exercise and reduced stress levels?

i) Yes ii) No

25) Have you ever intentionally increase your exercise routine during particularly stressful periods?

i) Yes ii) No

26) How consistent are you in maintaining a daily exercise routine?

i) Daily ii) Weekly iii) Monthly

27) Do you think the social aspect of a group exercise influence stress reduction differently than individual workouts?

i) Yes ii) No

28) Do you feel a sense of relief after completing your daily exercise routine?

i) Yes ii) No

29) How has the covid-19 Pandemic affected your exercise habits and stress levels ?

i) You Start Exercise ii) You Left Exercise iii) No Change

30) Which type of exercise facility influences stress reduction?

i) Gym ii)Home iii)Outdoor

DETERMINATION OF SAMPLE SIZE

Need of deciding Sample size : In the planning of Sample survey a stage always arise at which decision about the sample size must be made so that the population parameter must be estimated in specified degree of decision.

For the large Population size N (i.e. as $N \rightarrow \infty$), the sample size can be determined as follows.

n = Sample size, d = Margin of Error, α = l.o.s., s^2 = Sample Mean Square.

$$n = (Z_{\alpha/2}^2 * s^2)/d^2$$

Let $\alpha = 0.41$, $s^2 = 150$, $d = 0.5$, $Z_{\alpha/2} = Z_{0.205} = 0.82$

$$n = ((0.82)^2 * 150) / (0.5)^2$$

$$n = 403.44$$

Therefore, the required Sample size is 403.44 (Approximately 404).

DATA DESCRIPTION

We collect a primary data with the help of Google form. The data is related to the daily Exercise habits of people and its role in Stress reduction and solving their Mental health problems. The sample of 404 was taken from the population of size 1000000 of the Shrirampur city. There are 3 Variables in the data which are Height, Weight and Age.

Data description:

Data on daily exercise habits of people:

1) Age (numeric)
2) Residential status: (type of residence like urban or rural)
3) Weight (numeric – in kg)
4) Height (numeric – in cm)
5) Exercise performance (‘yes’, ’no’, ‘maybe’)
6) Type of exercise (‘physical exercise’, ‘yoga’, ‘meditation’)
7) Time given for exercise (‘half hour’, ‘one hour’, ‘two hours’, ’more than two hours’)

METHODOLOGY OF TESTS

To test the dependency/independency of different pairs of Attributes.

Chi-square (χ^2) test of Independence of attributes.

Here, we test

H_0 : Two specified Attributes are independent.

v/s H_1 : Two specified Attributes are not independent.

l. o. s. = $\alpha = 0.05$

Computing system for independency/dependency : In this section, we make a tabular form of "n" levels of Attribute A and m levels of attribute B such as

Attribute A	Attribute B B_1 B_2……B_j…… B_m	Total
A1	O_{11} O_{12} ……O_{1j}…… O_{1m}	(A_1)
A2	O_{21} O_{22} ……O_{2j}…… O_{2m}	(A_2)
.		
.		
Ai	O_{i1} O_{i2} ……O_{ij}…… O_{im}	(A_i)
.		
.		
An	O_{n1} O_{n2} ……O_{nj}……O_{nm}	(A_n)
Total	(B_1) (B_2)……(B_j)…… (B_m)	N

Where,

O = Observed frequency corresponding to i^{th} row and j^{th} column. i.e. corresponding to $(i, j)^{th}$ cell.

i=1,2,……..,n and j=1,2,…….,m

$(A_i) = \sum O_{ij}$ m j = Total observed frequency in i^{th} row.

$(B_j) = \sum O_{ij}$ n I = Total observed frequency in j^{th} column.

Here we test,

H_0 : Attributes A and B are independent.

v/s H_1 : Attributes A and B are not independent.

To carry out the above test, we compute the test statistic as,

$$\chi^2 = (O_{ij} - E_i)^2/E_{ij}$$

Where,

E_{ij} is expected frequency of (i,j)th cell and it is given as,

$E_{ij} = A_i . B_j/N$; i = 1,2,……n & j = 1,2,… ……. m.

Under H_0

$$\chi^2 = (O_{ij} - E_{ij})^2/E_{ij}$$

follows Chi-square distribution with (n-1)(m-1) degree of freedom.

Criteria :

We reject H_0 at α% l. o. s. if p-value = $P(\chi^2 (n-1)(m-1) > \chi^2_{cal})$

Proportion Test:

➤ Testing population proportion (P) equal to specified value (P_0):
Here we want to test,

Ho: $P = P_0$ v/s H:$P \neq P_0$

To carry out the above test we compute the test statisticas,

$Z= (P - P_0)/\sqrt{P_0*Q_0/n}$ follows N(0,1)

Where,

P= proportion of certain type of item in population.

n = sample size

X=no. of items of certain type in a sample size n.

p = x/n = proportion of certain type of item in sample.

P_0 = specified value of P

$Q_0 = 1 – P_0$

Decision rule:

Case 1:

If H1: $P \neq P_0$ then critical region is given by $|Z| > Z_{\alpha/2}$ at α% L.O.S.

Case 2:

If H_1: $P < P_0$ then critical region is given by $Z < -Z\alpha$ at α% L.O.S. and for H_1: $p > P_0$ then critical region is given by $Z > Z\alpha$, at α% L.O.S.

P-value: the above hypothesis can be tested using P-value criterion.

If P-value $P(|Z| > |Z_{cal}|) <$ level of significance Reject Ho, accept otherwise.

➤ Testing equality of two population proportion (P1=P2):

Here we want to test,

H_0: P1 = P2 v/s H1:P1 ≠ P2

To carry out the above test we compute the test statistic as,

$Z = (p1 - p2)/\sqrt{P*Q*((1/n1)+(1/n2))}$ follows N(0,1)

Where,

n1=size of sample drawn from the first population.

n2 = size of sample drawn from second population.

X1= No. of items specific type in first sample

X2 = No. of items specific type in second sample.

P1 = proportion of specific item in first population

P2 = proportion of specific item in second population

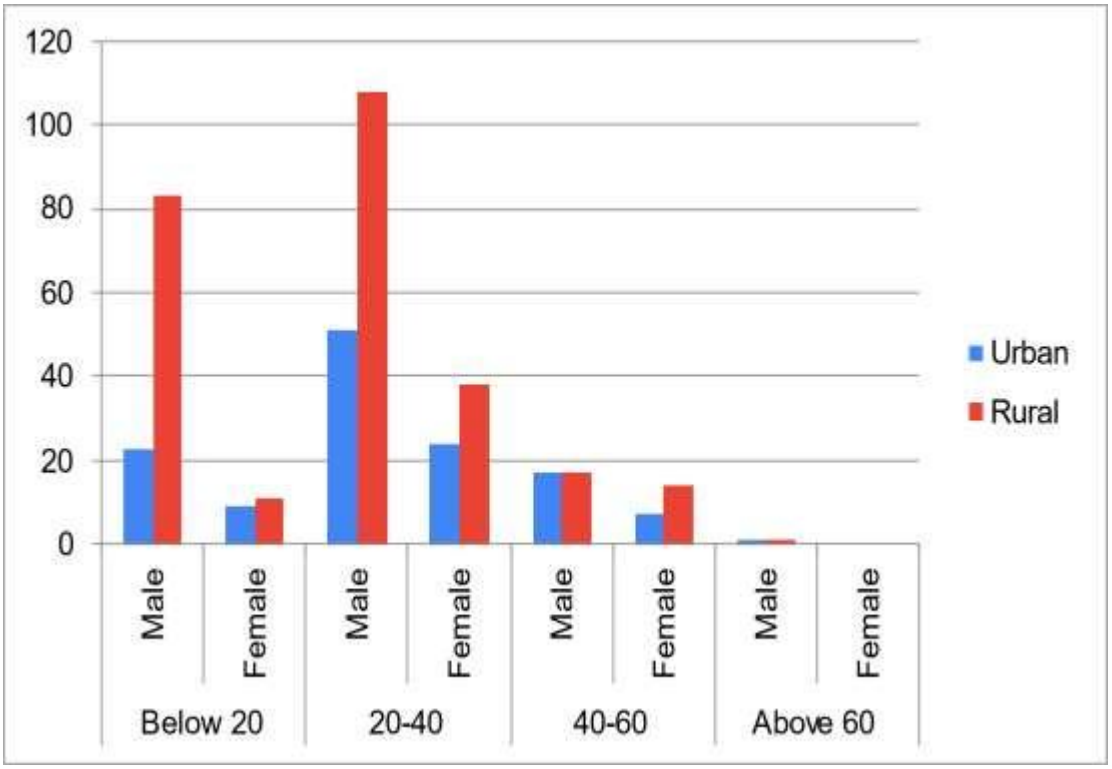
P=(X1+X2)/(n1+n2)

Decision rule:

If P-value = P(N(0,1) > Zcal) < level of significance, reject Ho, accept otherwise.

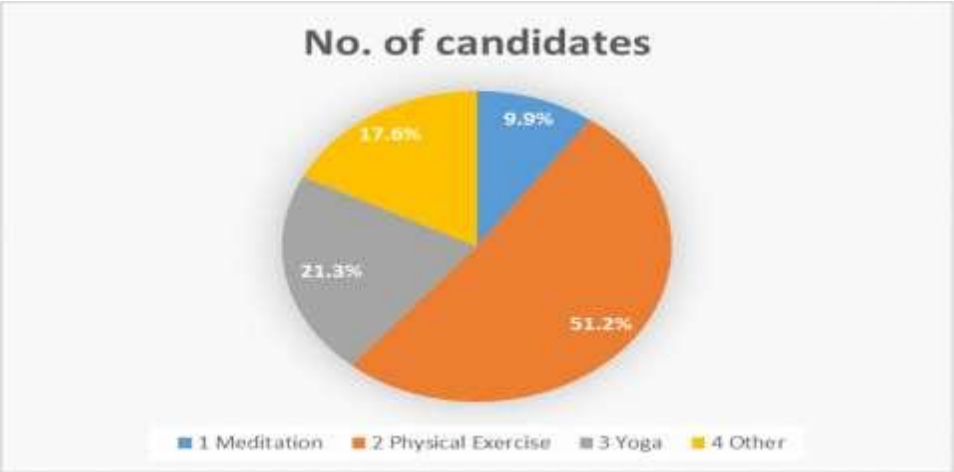
DATA VISUALIZATION

→ **Residence of people according to their age-group.**



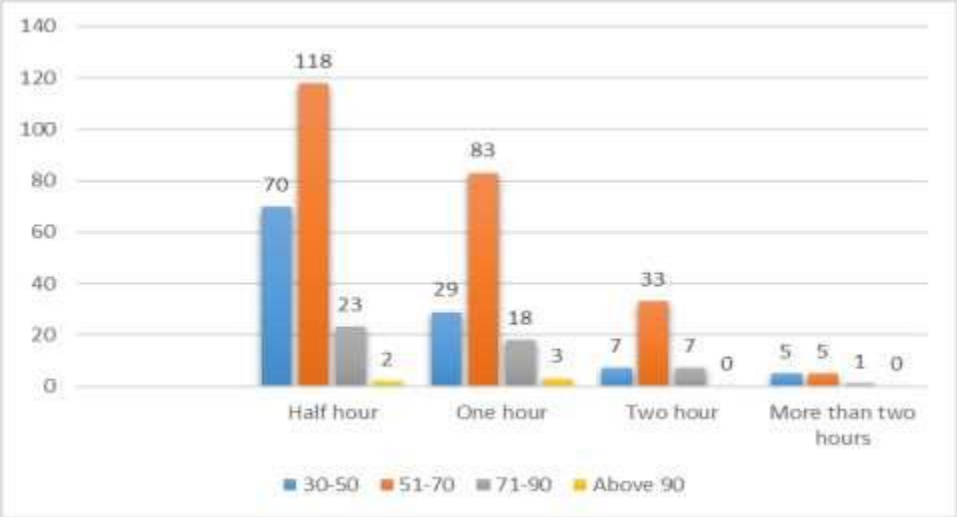
Conclusion: In the above graph we see that about 54.5% of population of age group 20-40 will do regular Exercise. Also about 2% of people of age group above 60 will do regular Exercise. Hence we can conclude that the more people of age group 20-40 do regular Exercise to remove their stress.

→ Type of exercise that people prefer to perform.



Conclusion- In the above Pie chart we see that about 51.2% of people do Physical Exercise, about 21.3% people do Yoga, about 9.9% people do Meditation and remaining do other Exercises. Hence we conclude that more people prefers Physical Exercise to remove their stress.

→ Time of the exercise according to their age-group.

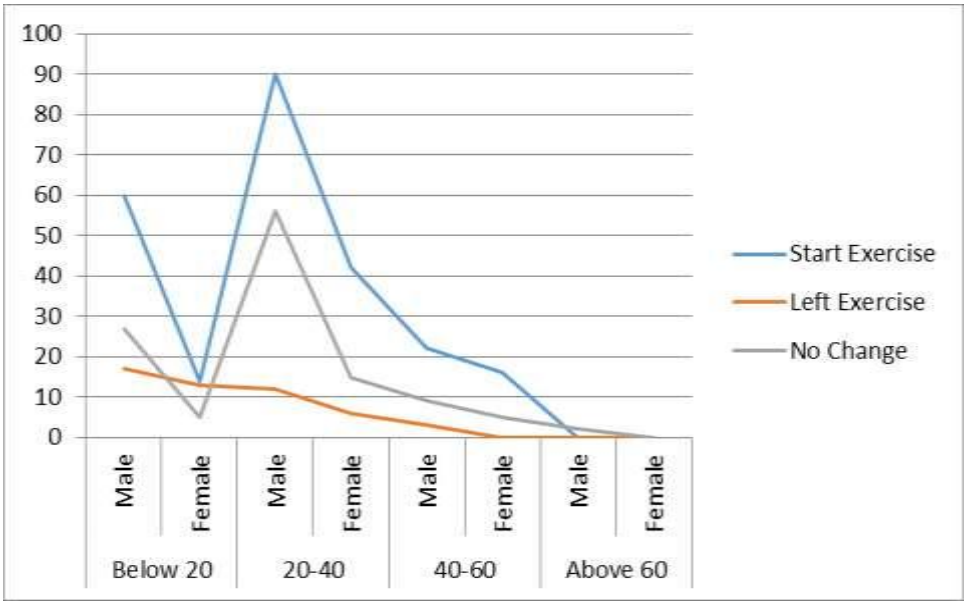


Conclusion- In the above Bar diagram we can see that from the sample of size 404 almost 213 people prefer to do Exercise for half hour, almost 144 people prefers one hour and less number of people prefers two or more than two hours to do Exercise. Hence we conclude that most of the people prefers to do Exercise for Half hour.

→ Male-female ratio in performing exercise.

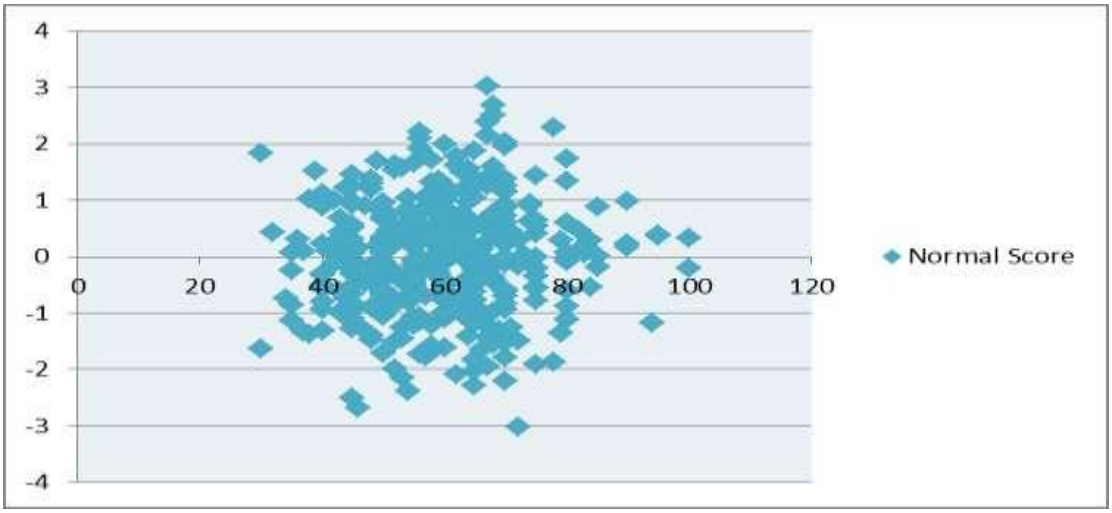
Conclusion- In the above graph we see that almost 73.51% male population and 26.48% female population from the sample of size 404 does Exercise to reduce their stress. And also we can conclude that most of the people prefers to do Exercise at home than outdoor.

→ Effect on pandemic on performance of exercise.



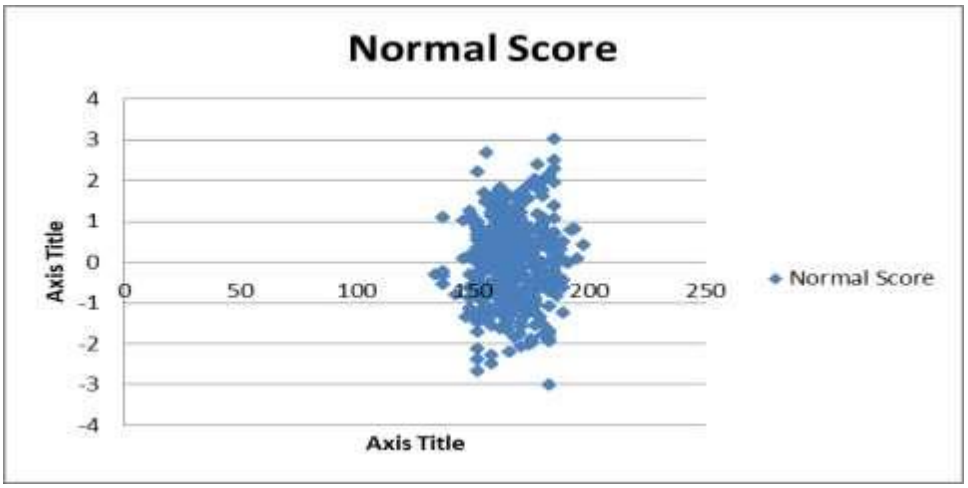
Conclusion-From the above trend line we can see that there is positive trend. More people started to perform the exercise after the Covid-19 pandemic.

Normal Probability Plot



We choose the variable characteristic Weight from the given data to check the Normality of the data.

Conclusion : On the basis of above Normal Probability Plot, we can conclude that the variable characteristic Weight is not Normally distributed.



We choose the variable characteristic Height from the given data to check the Normality of the data.

Conclusion : On the basis of above Normal Probability Plot, we can conclude that the variable characteristic Height is not Normally distributed.

DATA ANALYSIS

Chi-square tests for Independence of Attributes

To check the Dependency/ Independency of different pairs of Attributes

1) <u>To check the Dependence between Weight and Daily Exercise Performance for reducing stress in day today life.</u>

Here we have to check,

Hypothesis : H_0: Weight and Daily Exercise performance are independent. v/s

H_1: Weight and Daily Exercise performance are not independent.

Observation Table:

Weight	Daily Exercise Performance		
	Male	Female	Total
31-50	31	23	54
51-70	131	25	156
71-90	30	3	33
Above 90	3	0	3
Total	195	51	N=246

Formulae: Expected Frequency = (R*C)/N

Where, R=Row Total, C= Column Total

L.o.s.=0.05

Obs. No.	Oi	Ei	$(Oi-Ei)^2$	$(Oi-Ei)^2/Ei$
1	31	43	144	3.3488
2	131	124	49	0.3952
3	30	26	16	0.6154
4	3	2	1	0.5
5	23	11	144	13.0909
6	25	32	49	1.5313
7	3	7	16	2.2857
8	0	1	1	1

Degree of Freedom= (c-1)*(r-1)= (2-1)*(4-1) = 3

$\sum[(Oi-Ei)^2/Ei] = 22.7673$

Test Statistic : $\chi^2 = \sum[(Oi-Ei)^2/Ei] = 22.7673$

Table Value : $\chi^2\_(c-1)*(r-1),\alpha = \chi^2_{3,0.05} = 7.815$

R-Program : x=c(31,131,30,3,23,25,3,0);x

[1] 31 131 30 3 23 25 3 0

> y=matrix(c(x),nrow=4,ncol=2);y

```
> colnames(y)=c("Male","Female");y
     Male Female
[1,]   31     23
[2,]  131     25
[3,]   30      3
[4,]    3      0
> chisq.test(y,correct=F)
```

Pearson's Chi-squared test

data: y

X-squared = 21.312, df = 3, p-value = 9.07e-05

Decision Rule : Here p-value < l.o.s. Hence Reject H_0 at 5% l.o.s.

Conclusion : On the basis of sample data we can conclude that Weight and daily Exercise Performance are not Independent (i.e. they are dependent).

2) To check the Dependence between the number of people and the type of Exercise they use to reduce stress.

Hypothesis : H_0: Type of Exercise and number of people performing it are Independent. v/s

H_1: Type of Exercise and number of people performing it are not Independent.

Observation Table:

Type of Exercise	Number of People		
	Male	Female	Total
Physical Exercise	165	42	207
Meditation	30	10	40
Yoga	50	36	86
Other	53	18	71
Total	298	106	N=404

Formulae: Expected Frequency =(R*C)/N

Where, R=Row Total, C= Column Total

L.o.s.=0.05

Degree of Freedom= (c-1)*(r-1)= (2-1)*(4-1) = 3

Obs. No.	Oi	Ei	$(Oi-Ei)^2$	$(Oi-Ei)^2/Ei$
1	165	153	144	0.9412
2	30	30	0	0
3	50	63	169	2.6825
4	53	52	1	0.0192
5	42	54	144	2.6667
6	10	10	0	0
7	36	23	169	7.3478
8	18	19	1	0.0526

$\sum[(Oi-Ei)^2/Ei] = 13.71$

Test Statistic : $\chi^2 = \sum[(Oi-Ei)^2/Ei] = 13.71$

Table Value : $\chi^2_{(c-1)(r-1),\alpha} = \chi^2_{3,0.05} = 7.815$

R-Program :

```
x=c(165,30,50,53,42,10,36,18);x
[1] 165  30  50  53  42  10  36  18
> y=matrix(c(x), nrow=4,ncol=2);y
> colnames(y)=c("Male", "Female");y
```

```
     Male Female
[1,]  165     42
[2,]   30     10
[3,]   50     36
[4,]   53     18
> chisq.test(y,correct=F)
```

Pearson's Chi-squared test

data: y

X-squared = 14.69, df = 3, p-value = 0.002102

Decision Rule : Here $\chi^2_{cal} > \chi^2_{table}$. Hence Reject H_0 at 5% l.o.s.

Conclusion : On the basis of sample data we can conclude that type of Exercise and number of people performing it to reduce stress are not Independent (i.e. they are dependent).

3) To check the Dependence between the type of exercise people do and feeling after performing it.

Hypothesis : H_0: Feeling of people after performing Exercise is independent on type of Exercise.

v/s

H_1: Feeling of people after performing Exercise is not independent on type of Exercise.

Observation table :

Type of Exercise	Feeling after Workout			
	Energetic	Fresh	Tired	Total
Physical Exercise	70	61	13	144
Meditation	68	100	11	179
Yoga	23	43	15	81
Total	161	204	39	N=404

Formulae: Expected Frequency = (R*C)/N

Where, R=Row Total, C= Column Total

L.o.s.=0.05

Degree of Freedom= (c-1)*(r-1)= (3-1)*(3-1) = 4

Obs. No.	Oi	Ei	$(Oi-Ei)^2$	$(Oi-Ei)^2/Ei$
1	70	57	169	2.9649
2	68	71	9	0.1268
3	23	32	81	2.5313
4	61	73	144	1.9726
5	100	90	100	1.1111
6	43	41	4	0.0976
7	13	14	1	0.0714
8	11	17	36	2.1176
9	15	8	49	6.125

$\sum[(Oi-Ei)^2/Ei] = 17.1183$

Test Statistic : $\chi^2 = \sum[(Oi-Ei)^2/Ei] = 17.1183$

Table Value : $\chi^2_{(c-1)(r-1),\alpha} = \chi^2_{4,0.05} = 9.488$

R- Program :

```
: x=c(70,68,23,61,100,43,13,11,15);x
[1]  70  68  23  61 100  43  13  11  15
> y=matrix(c(x),nrow=3,ncol=3);y
> colnames(y)=c("Energetic", "Fresh", "Tired");y
```

```
 Energetic Fresh Tired
[1,]       70    61    13
[2,]       68   100    11
[3,]       23    43    15
> chisq.test(y,correct=F)
```

Pearson's Chi-squared test

data: y

X-squared = 17.548, df = 4, p-value = 0.001512

Decision Rule: Here p-value < l. o. s.(α=0.05). Hence Reject H_0 at 5% l.o.s.

Conclusion : On the basis of sample data we can conclude that the type of Exercise people do and feeling after performing it are not Independent (i.e. they are dependent).

4) To check the Dependence of Effects of Exercise in reducing stress and number of people doing Exercise.

Hypothesis : H_0: Effect of Exercise on people in reducing their stress cannot affects the number of people.

v/s

H_1: Effect of Exercise on people in reducing their stress can affects the number of people.

Observation table :

Effect of Exercise	Number of people		
	Male	Female	Total
Good Effect	215	67	282
Bad Effect	21	10	31
No Effect	62	29	91
Total	298	106	N=404

Formulae : Expected Frequency = (R*C)/N

Where, R=Row Total, C= Column Total

L. o. s.=0.05

Degree of Freedom= (c-1)*(r-1)= (2-1)*(3-1) = 2

Obs. No.	Oi	Ei	$(Oi-Ei)^2$	$(Oi-Ei)^2/Ei$
1	215	208	49	0.2356
2	21	23	4	0.1739
3	62	67	25	0.3731
4	67	74	49	0.6622
5	10	8	4	0.5
6	29	24	25	1.0417

$\sum[(Oi-Ei)^2/Ei] = 2.9865$

Test Statistic : $\chi^2 = \sum[(Oi-Ei)^2/Ei] = 2.9865$

Table Value : $\chi^2_{(c-1)(r-1),\alpha} = \chi^2_{2,0.05} = 5.991$

R-Program:

```
x=c(215,21,62,67,10,29);x
[1] 215  21  62  67  10  29
> y=matrix(c(x), nrow=3,ncol=2);y
> colnames(y)=c("male", "female");y
```

male female

[1,] 215 67

[2,] 21 10

[3,] 62 29

> chisq.test(y,correct=F)

Pearson's Chi-squared test

data: y

X-squared = 2.9665, df = 2, p-value = 0.2269

Decision Rule : Here p-value > l. o. s.(α=0.05). Hence Accept H_0 at 5% l. o. s.

Conclusion : On the basis of sample data we can conclude that the effects of exercise in reducing stress and number of people doing Exercise are Independent.

Tests for Proportion

1)<u>To check the performance of people in doing Exercise for reducing stress in their day today life from Urban area</u>.

Given : n=132, α=0.05

X= Number of Urban out of n = 81

Po = Urban population performs 25% Exercise

Po=0.25, Qo=0.75

p=X/n = 81/132=0.6136

Hypothesis : H_0 : p=0.25 v/s H_1 : p>0.25

Test Statistic : Z = p-Po/sqrt(Po*Qo/n) follows N(0,1)

Z = (0.6136-0.25)/sqrt((0.25*0.75)/132)

Z = 9.6474

Table Value : $Z_\alpha = Z_{0.05} = 1.64$

R-Program:

```
x=81;x
[1] 81
> n=132;n
[1] 132
> prop.test(x, n, p=0.25,alternative="greater")
```

1-sample proportions test with continuity correction

data: x out of n, null probability 0.25

X-squared = 91.162, df = 1, p-value < 2.2e-16

alternative hypothesis: true p is greater than 0.25

95 percent confidence interval:

0.5384777 1.0000000

sample estimates:

p = 0.6136364

Decision Rule : Here p-value < l. o. s.(α=0.05).Hence Reject H_0 at 5% l. o. s.

Conclusion : On the basis of sample data we can conclude that more than 25% Exercise done by Urban population.

2)<u>To test the preference of people in doing Exercise for stress reduction from the given data.</u>

Given : n=404 , α=0.05

X= Number of people doing Exercise out of n= 249

P=X/n = 249/404 = 0.6163

Po = 60% people do Exercise out of n.

Po=0.6, Qo=0.4

Hypothesis : H_0 : p=0.6 v/s H_1 : p>0.6

Test Statistic : Z = p-Po/sqrt(Po*Qo/n) follows N(0,1)\

Z = (0.6163-0.6)/sqrt((0.6*0.4)/404)

Z = 0.6689

Table value : $Z_\alpha = Z_{0.05} = 1.64$

R-Program :

```
x=249;x
[1] 249
> n=404;n
[1] 404
> prop.test(x, n, p=0.6,alternative="greater")
```

1-sample proportions test with continuity correction

data: x out of n, null probability 0.6

X-squared = 0.38377, df = 1, p-value = 0.2678

alternative hypothesis: true p is greater than 0.6

95 percent confidence interval:

0.5746402 1.0000000

sample estimates:

p = 0.6163366

Decision Rule : Here p-value > l. o. s.(α=0.05).Hence Accept H_0 at 5% l. o. s.

Conclusion : On the basis of sample data we can conclude that about 60% people do Exercise for reducing their day today life stress.

3)To check the preference of people to do Physical Exercise for reducing their Stress.

Let P1 and P2 be the proportion of number of people from Rural and Urban area doing Physical Exercise Daily.

Hypothesis : $H_0 : p1=p2$ v/s $H_1 : p1 \neq p2$

n1 = Number of people in Rural area.

X1 = Number of people in n1 performing Physical Exercise.

n2 = Number of people in Urban area

X2 = Number of people in n2 performing Physical Exercise.

n1 = 272, X1 = 140, n2 = 132, X2 = 67

p1 = X1/n1 = 140/272 = 0.5147

p2 = X2/n2 = 67/132 = 0.5075

Test Statistic : Z = (p1-p2)/sqrt((P- *Q-)*((1/n1)+(1/n2))

Where, $\bar{P}$ = (X1+X2)/(n1+n2) = (140+67)/(272+132) = 0.5124

$\bar{Q}$ =1-P = 1-0.5124 = 0.4876

Z = (0.5147-0.5075)/sqrt{[0.5124*0.4876][(1/272)+(1/132)]}

Z = 0.1358

Table value : $Z_{\alpha/2} = Z_{0.025}$ =1.96

R-Program :

```
x=c(140,67);x
[1] 140  67
> n=c(272,132);n
[1] 272 132
> prop.test(x, n, alt="two.sided")
```

2-sample test for equality of proportions with continuity correction

data: x out of n

X-squared = 0.00080462, df = 1, p-value = 0.9774

alternative hypothesis: two.sided

95 percent confidence interval:

-0.1024263 0.1166866

sample estimates:

prop 1 prop 2

0.5147059 0.5075758

Decision Rule : Here p-value > l. o. s.(α=0.05).Hence accept H_0 at 5% l. o. s.

Conclusion : On the basis of sample data we can conclude that the proportion of number of people doing Physical Exercise from Rural and Urban area are equal.

4) To check the preference of people to do Yoga for reducing their Stress.

Let P1 and P2 be the proportion of number of people from Rural and Urban area doing Yoga Daily.

Hypothesis : H_0 : p1=p2 v/s H_1:p1≠p2

n1 = Number of people in Rural area.

X1 = Number of people in n1 performing Yoga.

n2 = Number of people in Urban area.

X2 = Number of people in n2 performing Yoga.

n1 = 272, X1 = 53, n2 = 132, X2 = 33

p1 = X1/n1 = 53/272 = 0.1949

p2 = X2/n2 = 33/132 = 0.25

Test Statistic : Z = (p1-p2)/sqrt((P- *Q-)*((1/n1)+(1/n2))

Where, P- = (X1+X2)/(n1+n2) = (53+33)/(272+132) = 0.2129

Q- =1-P- = 1-0.2129 = 0.7871

Z = (0.1949-0.25)/sqrt{[0.2129*0.7871][(1/272)+(1/132)]}

Z = -0.0015

Table value : $Z_{\alpha/2} = Z_{0.025} = 1.96$

R Program:

```
x=c(53,33);x
[1] 53 33
> n=c(272,132);n
[1] 272 132
> prop.test(x, n, alt="two.sided")
```

2-sample test for equality of proportions with continuity correction

data: x out of n

X-squared = 1.3007, df = 1, p-value = 0.2541

alternative hypothesis: two.sided

95 percent confidence interval:

-0.14836490 0.03807078

sample estimates:

prop 1 prop 2

0.1948529 0.2500000

Decision Rule : Here p-value > l. o. s.(α=0.05).Hence Accept H_0 at 5% l. o. s.

Conclusion : On the basis of sample data we can conclude that the proportion of number of people doing Yoga from Rural and Urban area are not equal.

5) To check the preference of people to do Meditation for reducing their Stress.

Let P1 and P2 be the proportion of number of people from Rural and Urban area doing Meditation Daily.

Hypothesis : $H_0 : p1=p2$ v/s $H_1 : p1 \neq p2$

n1 = Number of people in Rural area.

X1 = Number of people in n1 performing Meditation.

n2 = Number of people in Urban area.

X2 = Number of people in n2 performing Meditation.

n1 = 272, X1 = 25, n2 = 132, X2 = 15

p1 = X1/n1 = 25/272 = 0.0919

p2 = X2/n2 = 15/132 = 0.1136

Test Statistic : Z = (p1-p2)/sqrt((P- *Q-)*((1/n1)+(1/n2))

Where, P- = (X1+X2)/(n1+n2) = (25+15)/(272+132) = 0.099

Q- =1-P- = 1-0.099 = 0.901

Z = (0.091-0.1136)/sqrt{[0.099*0.901][(1/272)+(1/132)]}

Z = -0.6845

Table value : $Z_{\alpha/2} = Z_{0.025} = 1.96$

R-Program : x=c(25,15);x

[1] 25 15

> n=c(272,132);n

[1] 272 132

> prop.test(x, n, alt="two.sided")

2-sample test for equality of proportions with continuity correction

data: x out of n

X-squared = 0.25819, df = 1, p-value = 0.6114

alternative hypothesis: two.sided

95 percent confidence interval:

-0.09146002 0.04801083

sample estimates:

prop 1 prop 2

0.09191176 0.11363636

Decision Rule : Here p-value > l.o.s.(α=0.05). Hence Accept H_0 at 5% l.o.s.

Conclusion : On the basis of sample data we can conclude that the proportion of number of people doing Meditation from Rural and Urban area are equal.

CONCLUSION

From the above Analysis our findings are,

- There is correlation between regular exercise and reduced stress level.
- There is close relation between weight and daily exercise habits.
- The Physical exercise more preferable than Yoga and Meditation.
- People of age group 20-40 involves more in Daily Exercise.
- Daily exercise has Good effect on reducing Stress and good Mental health.

LIMITATIONS

- The limited sample is taken from a large Population.
- The data is taken only from a Shrirampur Taluka.

FUTURE SCOPE

From this analysis, we observe that the daily Exercise plays an important role in Reducing Stress level of people and removing their mental health problems. In future this type of Exercise habit is very necessary due to

i) Increasing work on Computers, Laptops, Mobiles, etc.

ii) Increasing work loads on People.

iii) Busy Schedule of People.

REFERENCES

- Fundamental of Mathematical Statistics.
- Google