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INTRODUCTION

Introduction

The project gives us an insight into the various aspects of human life. We have tried to measure these qualitative characteristics using Likert's Scale. We have considered Happiness, Self Esteem, Resilience and Optimism as our attributes under study.

About Happiness Test

Happiness is a mental or emotional state of well-being characterized by positive or pleasant emotions ranging from contentment to intense joy. A variety of biological, psychological, religious, and philosophical approaches have striven to define happiness and identify its sources. Various research groups, including positive psychology, endeavour to apply the scientific method to answer questions about what "happiness" is, and how it might be attained.

How to calculate scores?

Step 1. Items marked (R) should be scored in reverse: For example, if you gave yourself a "1," cross it out and change it to a "6." Change "2 to a "5 Change "3 to a "4 Change "4 to a "3 Change "5 to a "2 Change "6 to a "1

Step 2. Add the numbers for all 10 questions. (Use the converted numbers for the 5 items that are reverse scored.)

Step 3. Divide by 10. So your happiness score = the total (from step 2) divided by 10.

About Self Esteem Test

In sociology and psychology, self-esteem reflects a person's overall emotional evaluation of his or her own worth. It is a judgment of oneself as well as an attitude toward the self. Self-esteem encompasses beliefs (for example, "I am competent," "I am worthy") and emotions such as triumph, despair, pride and shame. Smith and Mackie define it by saying "The self-concept is what we think about the self; self-esteem, is the positive or negative evaluations of the self, as in how we feel about it." Self-esteem is also known as the evaluative dimension of the self that includes feelings of worthiness, prides and discouragement. One's self-esteem is also closely associated with self-consciousness. Self-esteem is a disposition that a person has which represents their judgments of their own worthiness.

About Resilience Test

Resilience is "the ability [of a system] to cope with change".

Psychological resilience is defined as an individual's ability to properly adapt to stress and adversity. Stress and adversity can come in the shape of family or relationship problems, health problems, or workplace and financial stressors, among others. Individuals demonstrate resilience when they can face difficult experiences and rise above them with ease. Resilience is not a rare ability; in reality, it is found in the average individual and it can be learned and developed by virtually anyone. Resilience should be considered a process, rather than a trait to be had. There is a common

misconception that people who are resilient experience no negative emotions or thoughts and display optimism in all situations. Contrary to this misconception, the reality remains that resiliency is demonstrated within individuals who can effectively and relatively easily navigate their way around crises and utilize effective methods of coping. In other words, people who demonstrate resilience are people with positive emotionality; they are keen to effectively balance negative emotions with positive ones.

Studies show that there are several other factors which develop and sustain a person's resilience:

1. The ability to make realistic plans and being capable of taking the steps necessary to follow through with them
2. A positive self-concept and confidence in one's strengths and abilities
3. Communication and problem-solving skills
4. The ability to manage strong impulses and feelings.

How to calculate scores?

The 12-item CCQ (Coping Competence Questionnaire) was presented with 6-point Likert response scales ranging from 1 = "Very uncharacteristic of me" to 6 = "Very characteristic of me." Items were reversed and summed, with high scores indicating resilience to learned helplessness (i.e. coping competence) and low scores indicating a propensity towards helplessness in stressful situations. The sum scores ranged from 12 to 72, covering the entire range of possible scores.

About Optimism Test

It is defined as the disposition tendency to look on the more favourable side of an event or condition and to expect the most favourable outcome. Being optimistic, in this typical sense of word, ultimately means one expects the best possible outcome from any given situation which is usually referred to in psychology as dispositional optimism.

About Wellness Test

During the course of this project, we have ourselves defined a measure of well being based on the above 4 attributes. It tells us about the Overall Wellness of an individual by taking the combined mean of the level of his/her Happiness, Self Esteem, Resilience and Optimism.

About Testing of Hypothesis

Tests Used

1. t-test for testing significance of correlation coefficient R

When the test is against the null hypothesis: $r_{xy} = 0.0$

- The sampling distribution of r is
 - approximately normal (but bounded at -1.0 and +1.0) when N is large
 - distributes t when N is small.
- The simplest formula for computing the appropriate t value to test significance of a correlation coefficient employs the t distribution:

$$t = r \sqrt{\frac{n-2}{1-r^2}}$$

- The degrees of freedom for entering the t-distribution is $N - 2$

2. Welch's t-test

In statistics, Welch's t -test (or Welch-Aspin Test) is a two-sample location test, and is used to check the hypothesis that two populations have equal means. Welch's t -test is an adaptation of Student's t -test, and is intended for use when the two samples have possibly unequal variances. These tests are often referred to as "unpaired" or "independent samples" t -tests, as they are typically applied when the statistical units underlying the two samples being compared are non-overlapping.

Welch's t -test defines the statistic t by the following formula:

$$t = \frac{\bar{X}_1 - \bar{X}_2}{\sqrt{\frac{s_1^2}{N_1} + \frac{s_2^2}{N_2}}}$$

where \bar{X}_1 , s_1^2 and N_1 are the 1st sample mean, sample variance and sample size, respectively. Unlike in Student's t -test, the denominator is *not* based on a pooled variance estimate.

The degrees of freedom ν associated with this variance estimate are approximated using the Welch–Satterthwaite equation:

$$\nu \approx \frac{\left(\frac{s_1^2}{N_1} + \frac{s_2^2}{N_2} \right)^2}{\frac{s_1^4}{N_1^2 \nu_1} + \frac{s_2^4}{N_2^2 \nu_2}}$$

Here $\nu_1 = N_1 - 1$, the degrees of freedom associated with the 1st variance estimate.

DATA SOURCE
And
SOFTWARE USED

Data Source

- The type of data used is Primary Data.
- We covered the areas of Magarpatta City, Pimpri, Fergusson College, and Modern College.

Software Used

- R-Software
- MS-Excel
- MS-Word

MOTIVATION

Motivation

It's been almost two years since we started learning statistics and so far we have been working upon only the quantitative characteristics but nothing related to the various qualities that are present in front of us. This is perhaps the only project report of the department that deals with qualitative characteristics or the virtues that people possess and works upon them. This was one of the major reasons why we chose this topic for our project.

Being students we were curious to know about the well being of people we see around us. Also, we are still in a position to decide amongst the various career prospects and we wanted to make a rational decision based on statistics. As a result: Students, Teachers, Doctors, IT Professionals were the major categories that we analysed.

We wanted to know the various factors which affect the levels of happiness, self esteem, resilience & optimism. We also wanted to test common notions like effect of exercise, body mass index and number of sleeping hours on the above mentioned attributes.

METHODOLOGY

Methodology

We drafted a questionnaire with 4 psychological tests to test the levels of happiness, self esteem, resilience and optimism as well as questions related to personal and professional details of individuals under study. Our questionnaire consisted of 57 questions in all.

Then for collection of our data, we segregated our forms based on the occupation of people. The tedious job of data collection lasted for some 40 days. Then, we entered the data in MS Excel for our analysis.

We have used testing of hypothesis, goodness of fit, significance of correlation coefficient for the analysis of our data.

QUESTIONNAIRE

Wellness Attributes Measurement: A Statistical Survey

PERSONAL DETAILS

Date: / /

- Name(Optional):_____
- Age:_____ Date of Birth (DD/MM/YYYY): / /
- Gender: Male Female
- Height: _____cms.
- Weight: _____Kg.
- Qualification:

Primary	Secondary	Higher Secondary	Under Graduate	Graduate	Post Graduate	PhD
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PROFESSIONAL DETAILS

- Occupation-

Students	IT Professionals	Teachers	Housewife
Doctors	Managers	Business	Workers

If any other please mention here_____

- Income (Annual) _____Rs.(Pocket Money for Students)
- No. of Working Hours _____hrs.
- No. of Holidays (weekly) _____.

DAILY ROUTINE

- Average Number Of Hours Of Sleep-
At Night_____ during the Day _____
- No. Of hours you spend for exercise daily. _____

FIRST SCALE OF MEASUREMENT

Instructions

Below is a list of statements dealing with your general feelings about yourself. Please indicate how strongly you agree or disagree with each statement.

Responses-

1.Strongly Disagree	2.Moderately Disagree	3.Slightly Disagree
4.Slightly Agree	5.Moderately Agree	6.Strongly Agree

(Answer each of these questions by using any one of the above Responses)

- | | |
|---|-------------|
| 1. I feel I have a great deal of energy | 1 2 3 4 5 6 |
| 2. I don't feel particularly pleased with the way I am | 1 2 3 4 5 6 |
| 3. I feel that life is very rewarding | 1 2 3 4 5 6 |
| 4. I am well satisfied about everything in my life. | 1 2 3 4 5 6 |
| 5. I don't think I look attractive. | 1 2 3 4 5 6 |
| 6. I find beauty in some things. | 1 2 3 4 5 6 |
| 7. I can fit in everything I want to. | 1 2 3 4 5 6 |
| 8. I feel that I am not especially in control of my life. | 1 2 3 4 5 6 |
| 9. I feel fully mentally alert. | 1 2 3 4 5 6 |
| 10.I do not have particularly happy memories of the past. | 1 2 3 4 5 6 |

SECOND SCALE OF MEASUREMENT

Responses-

1)Strongly Agree	2)Agree	3)Disagree	4)Strongly Disagree
------------------	---------	------------	---------------------

- | | |
|---|---------|
| 1. On the whole, I am satisfied with myself. | 1 2 3 4 |
| 2. At times I think I am no good at all. | 1 2 3 4 |
| 3. I feel that I have a number of good qualities. | 1 2 3 4 |
| 4. I am able to do things as well as most other people. | 1 2 3 4 |
| 5. I feel I do not have much to be proud of. | 1 2 3 4 |
| 6. I certainly feel useless at times. | 1 2 3 4 |
| 7. I feel that I'm a person of worth, at least on an equal plane with others. | 1 2 3 4 |
| 8. I wish I could have more respect for myself. | 1 2 3 4 |
| 9. All in all, I am inclined to feel that I am a failure. | 1 2 3 4 |
| 10.I take a positive attitude toward myself. | 1 2 3 4 |

THIRD SCALE OF MEASUREMENT

Responses-

1.Strongly Disagree	2.Moderately Disagree	3.Slightly Disagree
4.Slightly Agree	5.Moderately Agree	6.Strongly Agree

1. I become easily discouraged by failures. **1 2 3 4 5 6**
2. When my performance does not satisfy, I start to question my abilities. **1 2 3 4 5 6**
3. I often feel unable to deal with problems. **1 2 3 4 5 6**
4. Failures can shake my self-confidence for a long time. **1 2 3 4 5 6**
5. When I am confronted with unusual demands, I feel helpless **1 2 3 4 5 6**
6. When I do not immediately succeed in a project, I quickly lose hope for a good outcome. **1 2 3 4 5 6**
7. When I can't solve a task, I blame my lack of abilities. **1 2 3 4 5 6**
8. When I fail at something, I tend to give up. **1 2 3 4 5 6**
9. When my work is criticized, I feel depressed. **1 2 3 4 5 6**
10. I often feel overpowered by obstacles or troubles. **1 2 3 4 5 6**
11. I lose faith in myself when I make mistakes. **1 2 3 4 5 6**
12. If I do not instantly succeed in a matter, I am at a loss. **1 2 3 4 5 6**

FOURTH SCALE OF MEASUREMENT

Responses-

1.Strongly Disagree	2.Moderately Disagree	3.Slightly Disagree
4.Slightly Agree	5.Moderately Agree	6.Strongly Agree

1. I'm always optimistic about my future. **1 2 3 4 5 6**
2. It's important for me to keep busy. **1 2 3 4 5 6**
3. I don't get upset too easily. **1 2 3 4 5 6**
4. It's easy for me to relax. **1 2 3 4 5 6**
5. I believe that my future will work out. **1 2 3 4 5 6**
6. I believe I have what it takes to succeed in my life. **1 2 3 4 5 6**
7. I believe that if you work hard enough, you can accomplish anything. **1 2 3 4 5 6**
8. I believe I can reach my goals. **1 2 3 4 5 6**
9. I hardly ever expect things to go my way. **1 2 3 4 5 6**
10. I rarely count on good things happening to me. **1 2 3 4 5 6**

Causes of Stress:

Education	Security Issues
Own Health Problems	Problem with Finances
Family Health Problems	Problem with family members
Too many responsibilities	Problem with friends
Unhappy with the way you look	

If any other please mention here-

THANK YOU

DATA

DATA ANALYSIS

Correlations between the Scores & Testing their Significance

Let r : correlation coefficient,

A: Happiness B: Self Esteem C: Resilience D: Optimism

$H_0: r=0$

$H_1: r \neq 0$

Correlation Coefficients	Values(r)	test statistic(t)	Testing Significance of r
			p-value
r_{AB}	0.379413	5.022373248	1.43E-06
r_{AC}	0.350176	4.578663107	9.76E-06
r_{AD}	0.384451	5.100543633	1.01E-06
r_{BC}	0.337518	4.391431051	2.12E-05
r_{BD}	0.394809	5.262948345	4.82E-07
r_{CD}	0.266623	3.388095776	0.000899

Interpretation:

- As all the p-values of test statistics are very small, all the correlation coefficients are significantly different from zero, in this case significantly greater than zero.
- Hence all the attributes are positively correlated.

Correlation between the Scores & the Exercise

Let 1: Happiness, 2:Self-Esteem, 3: Resilience, 4: Optimism, 5: Wellness correlated with Exercise.

t:test statistic abs(t):absolute value of t

Sr. No.	CORRELATIONS	t	abs(t)	p-value
1	0.25289504	3.201384	3.201384115	0.002763
2	0.005641829	0.069099	0.069099116	0.945273
3	0.129021439	1.593502	1.593502261	0.119333
4	0.025735341	0.315297	0.315296699	0.754261
5	0.129657853	1.648842	1.648841533	0.101155

Interpretation:

- The p-value of first test statistic is lesser than 1% level of significance, hence the result is very significant.
- Therefore Exercise & Happiness are positively correlated.
- Hence as exercise hours increase level of happiness increases.
- All the other attributes are not affected by Exercising.

Correlation between the Scores & the Annual Income

Sr. No.	r	t	Testing Significance of r
			p-value
1	-0.19884	-1.21006	0.191292
2	0.094802	1.27952	0.536049
3	-0.0026	0.253733	0.986512
4	0.034517	0.518011	0.830386
5	0.146231	1.863933	0.064175

Interpretation:

- All the p-values are greater than 0.05, hence all the above correlations are not significantly different from zero.
- Hence Income has no significant effect on these attributes.

Correlation between the Scores & the BMI

Sr. No.	r	t	P-VALUE
1	0.115815	1.38944	0.166874
2	0.023882	0.284671	0.776311
3	0.213494	2.604118	0.010191
4	0.046444	0.554046	0.580419
5	0.176255	2.13372	0.034584

Interpretation:

- As the p-values for the case Resilience & the Wellness are lesser than 0.05 the respective correlation coefficients are significantly greater than zero.
- Hence we can say that as BMI increases Resilience increases & also the wellness attribute.

Correlation between the Scores & the Working Hours

Sr.No.	CORRELATIONS	t	p-value
1	0.075665807	0.845001	0.399737638
2	0.144563136	1.626876	0.106301938
3	0.05628686	0.627779	0.531303007
4	0.153355344	1.728135	0.086453421
5	0.099108351	1.255892	0.210997462

Interpretation:

- As all of the above p-values are greater than 0.05 we accept H_0 .
- There is no correlation between working hours and the attributes.

Correlation between the Scores the Sleeping Hours

1) For sleeping Hours in the Night

Sr. No.	r	t	Abs(t)	p-value
1	-0.06771	-0.44503	0.445031	0.656939
2	-0.00033	-0.00214	0.002144	0.998293
3	0.115764	0.764253	0.764253	0.445917
4	0.118052	0.779572	0.779572	0.436871
5	0.074091	0.936825	0.936825	0.350269

2) For Sleeping Hours during the Day

Sr. No.	r	t	Abs(t)	p-value
1	-0.06875	-0.45188	0.451884	0.652005
2	0.014585	0.095649	0.095649	0.923927
3	-0.14495	-0.96065	0.96065	0.338274
4	-0.21337	-1.43217	1.43217	0.154176
5	-0.17843	-2.28665	2.28665	0.023536

Interpretation:

- All the p-values are greater than 0.05 in the first table; hence sleeping hours during the night have no effect on any of the five attributes.
- The p-value in the case of wellness correlated with the sleeping hours during the day is lesser than 0.05, hence wellness is negatively correlated with Sleeping Hours during the Day.

Testing of Hypothesis

To compare The Mean Scores of Male & Female Populations:

Testing Happiness Equality for Male and Female Population

t-Test: two-Sample Assuming Unequal Variances

μ_1 : Population Mean of Male Happiness Score

μ_2 : Population Mean of Female Happiness Score

$H_0: \mu_1 = \mu_2$

$H_1: \mu_1 \neq \mu_2$

	<i>Variable 1</i>	<i>Variable 2</i>
Mean	4.637178	4.566764
Variance	0.422314	0.521996
Observations	87	63
Hypothesized Mean Difference	0	
Df	125	
t Stat	0.614275	
P(T<=t) one-tail	0.270075	
t Critical one-tail	1.657135	
P(T<=t) two-tail	0.54015	
t Critical two-tail	1.979124	

Interpretation:

- We accept H_0 .
- The p-value is greater than level of significance, hence we accept H_0 .
- Hence Male & Female Population Happiness Means are not significantly different.

Testing Self Esteem Equality for Male and Female Population

t-Test: two-Sample Assuming Unequal
Variances

μ_1 : Population Mean of Male Self esteem
Score

μ_2 : Population Mean of Female Self esteem
Score

$H_0: \mu_1 = \mu_2$

$H_1: \mu_1 \neq \mu_2$

	<i>Variable 1</i>	<i>Variable 2</i>
Mean	4.756762	4.665476
Variance	0.341408	0.355891
Observations	87	63
Hypothesized Mean Difference	0	
Df	132	
t Stat	0.932985	
P(T<=t) one-tail	0.176266	
t Critical one-tail	1.656479	
P(T<=t) two-tail	0.352531	
t Critical two-tail	1.978099	

Interpretation:

- We accept H_0 .
- The p-value is greater than level of significance, hence we accept H_0 .
- Hence Male & Female Population Self Esteem Means are not significantly different.

Testing Resilience Equality for Male and Female Population

t-Test: two-Sample Assuming Unequal Variances

μ_1 : Population Mean of Male Resilience Score

μ_2 : Population Mean of Female Resilience Score

$H_0: \mu_1 = \mu_2$

$H_1: \mu_1 \neq \mu_2$

	<i>Variable 1</i>	<i>Variable 2</i>
Mean	4.287306	4.295658
Variance	1.165474	1.093776
Observations	87	63
Hypothesized Mean Difference	0	
Df	136	
t Stat	-0.04762	
P(T<=t) one-tail	0.481044	
t Critical one-tail	1.656135	
P(T<=t) two-tail	0.962088	
t Critical two-tail	1.977561	

Interpretation:

- We accept H_0 .
- The p-value is greater than level of significance, hence we accept H_0 .
- Hence Male & Female Population Resilience Means are not significantly different.

Testing Optimism Equality for Male and Female Population

t-Test: two-Sample Assuming Unequal Variances

μ_1 : Population Mean of Male Optimism Score

μ_2 : Population Mean of Female Optimism Score

$H_0: \mu_1 = \mu_2$

$H_1: \mu_1 \neq \mu_2$

	<i>Variable 1</i>	<i>Variable 2</i>
Mean	4.70885	4.654588
Variance	0.256915	0.319918
Observations	86	62
Hypothesized Mean Difference	0	
Df	123	
t Stat	0.60116	
P(T<=t) one-tail	0.27442	
t Critical one-tail	1.657336	
P(T<=t) two-tail	0.54884	
t Critical two-tail	1.979439	

Interpretation:

- We accept H_0 .
- The p-value is greater than level of significance, hence we accept H_0 .
- Hence Male & Female Population Optimism Means are not significantly different.

Testing Wellness Equality for Male and Female Population

t-Test: two-Sample Assuming Unequal Variances

μ_1 : Population Mean of Male Wellness Score

μ_2 : Population Mean of Female Wellness Score

$H_0: \mu_1 = \mu_2$

$H_1: \mu_1 \neq \mu_2$

	<i>Variable 1</i>	<i>Variable 2</i>
Mean	4.565882	4.511016
Variance	0.24216	0.302539
Observations	87	63
Hypothesized Mean Difference	0	
Df	125	
t Stat	0.629959	
P(T<=t) one-tail	0.264936	
t Critical one-tail	1.657135	
P(T<=t) two-tail	0.529872	
t Critical two-tail	1.979124	

Interpretation:

- We accept H_0 .
- The p-value is greater than level of significance, hence we accept H_0 .
- Hence Male & Female Population Wellness Means are not significantly different.

Testing Equality of population Self-Esteem means of Ph.D. & U.G.

t-Test: two-Sample Assuming
Unequal Variances

μ_1 : Population Mean of PhD Self
esteem Score

μ_2 : Population Mean of UG Self
esteem Score

$H_0: \mu_1 = \mu_2$

$H_1: \mu_1 \neq \mu_2$

t-Test: Two-Sample Assuming Unequal Variances

	Variable 1	Variable 2
Mean	5.203333	4.632971
Variance	0.285889	0.306673
Observations	5	46
Hypothesized Mean Difference	0	
Df	5	
t Stat	2.257298	
P(T<=t) one-tail	0.0368	
t Critical one-tail	2.015048	
P(T<=t) two-tail	0.073601	
t Critical two-tail	2.570582	

Interpretation

1. We accept H_0 .
2. There is no significant difference between population self esteem scores of PhD & UG.

Testing Equality of population self-esteem means of Housewives & Managers

μ_1 : Population Mean of Housewife Self esteem Score

μ_2 : Population Mean of Managers Self esteem Score

$H_0: \mu_1 = \mu_2$

$H_1: \mu_1 \neq \mu_2$

t-Test: Two-Sample Assuming Unequal Variances

	<i>Variable</i> <i>1</i>	<i>Variable</i> <i>2</i>
Mean	4.425	5.121429
Variance	0.304773	0.640714
Observations	12	7
Hypothesized Mean Difference	0	
df	9	
t Stat	-2.03665	
P(T<=t) one-tail	0.036077	
t Critical one-tail	1.833113	
P(T<=t) two-tail	0.072155	
t Critical two-tail	2.262157	

Interpretation

1. We accept H_0 .
2. There is no significant difference between population self esteem scores of Housewives & Managers.

DISTRIBUTION FITTING

1) Wellness

Fitting of Normal Probability Distribution

Classes	UB	Observed Frequency	Cumulative probability	Probability	Expected Frequencies
3 & below	3	0	0.001622565	0.001622565	0.261233041
3-3.5	3.5	2	0.023025902	0.021403336	3.445937133
3.5-4	4	23	0.147705239	0.124679338	20.07337338
4-4.5	4.5	53	0.461071719	0.31336648	50.45200324
4.5-5	5	48	0.802575866	0.341504147	54.98216765
5-5.5	5.5	28	0.964026236	0.16145037	25.99350958
5.5-6	6	7	0.997002384	0.032976148	5.309159787
Above 6	INF	0	1	0.002997616	0.482616193
		161			161

Sample Mean	4.551515
Sample Variance	0.277831
Sample Standard Deviation	0.527097

Note:

- In the above Frequency Distribution the classes have lower boundaries excluded, while upper boundaries included.
- No. Of parameters estimated for fitting the Distribution are 2.

Testing Goodness of Fit

To test H_0 : The Normal Distribution fitted to the wellness attribute score is proper.

Against H_1 : The Normal Distribution fitted to the wellness attribute score is not proper.

Observed Frequency	Expected Frequencies	Pooled Observed Classes	Pooled Observed Frequencies	Pooled Expected Frequencies	$((o_i - e_i)^2)/e_i$
0	0.261233041				
2	3.445937133				
23	20.07337338	Below 4	25	23.78054356	0.062533222
53	50.45200324	4-4.5	53	50.45200324	0.128682452
48	54.98216765	4.5-5	48	54.98216765	0.886663206
28	25.99350958	5-5.5	28	25.99350958	0.154884965
7	5.309159787	5.5 & above	7	5.79177598	0.252047953
0	0.482616193				
161	161			Test Statistic	1.484811799

Effective no. Of
classes=5

$p=2$

Critical
Value=

5.991464547

Conclusion:

- As the calculated test statistic is less than critical value, we accept H_0 .
- Hence normal distribution fitted is proper.
- Hence the difference between expected and observed frequencies is due to sampling i.e. by pure chance.

2)Happiness

Fitting of Normal Probability Distribution

Classes	Upper Boundaries	Observed Frequency	Cumulative Probability	Probability	Expected Frequency
3 & below	3	0	0.010591164	0.010591	1.6416304
3-3.5	3.5	7	0.056978485	0.046387	7.1900348
3.5-4	4	27	0.19583549	0.138857	21.522836
4-4.5	4.5	41	0.447283713	0.251448	38.974475
4.5-5	5	39	0.722919618	0.275636	42.723565
5-5.5	5.5	23	0.905845963	0.182926	28.353584
5.5-6	6	18	0.979308133	0.073462	11.386636
Above 6	More	0	1	0.020692	3.2072394
		155		1	155

Mean	4.59151613
Variance	0.47685485
Std Dev	0.69054677

Note:

- In the above Frequency Distribution the classes have lower boundaries excluded, while upper boundaries included.
- No. of parameters estimated for fitting the Distribution are 2.

Testing Goodness of Fit

To test H_0 : The Normal Distribution fitted to the happiness attribute score is proper.

Against H_1 : The Normal Distribution fitted to the happiness attribute score is not proper.

Classes	Upper Boundaries	Observed Frequency	Clubbed Observed Frequencies	Clubbed Expected Frequencies	oi-ei	(oi-ei) ² /ei
3 & below	3	0				
3-3.5	3.5	7	7	7	0	0
3.5-4	4	27	27	21.52284	5.4771643	1.393837162
4-4.5	4.5	41	41	38.97447	2.0255254	0.105267693
4.5-5	5	39	39	42.72357	-3.7235652	0.324526699
5-5.5	5.5	23	23	28.35358	-5.3535836	1.010837206
5.5-6	6	18	18	18	0	0
Above 6	More	0				
		155			Test Statistic	2.83446876

Effective no. Of classes (k) =6, p=2

Critical Value= 7.814728

Conclusion:

- As the calculated test statistic is less than critical value, we accept H_0 .
- Hence normal distribution fitted is proper.
- Hence the difference between expected and observed frequencies is due to sampling i.e. by pure chance.

3)Self Esteem

Fitting of Normal Probability Distribution

Classes	Upper Boundaries	Observed Frequency	Cumulative Probability	Probability	Expected Frequency
3 & Below	3	1	0.00196078	0.020525702	3.181483778
3-3.5	3.5	1	0.0205257	0.094230161	14.60567499
3.5-4	4	11	0.11475586	0.244583684	37.91047103
4-4.5	4.5	50	0.35933955	0.325461957	50.44660327
4.5-5	5	44	0.6848015	0.222207795	34.44220815
5-5.5	5.5	34	0.9070093	0.077756758	12.05229744
5.5-6	6	13	0.98476606	0.015233944	2.361261349
6 above		1	1	0	0

Mean	4.714065
Variance	0.353136
Standard Deviation	0.594253

Note:

- In the above Frequency Distribution the classes have lower boundaries excluded, while upper boundaries included.
- No. of parameters estimated for fitting the Distribution are 2.

Testing Goodness of Fit

To test H_0 : The Normal Distribution fitted to the Self Esteem attribute score is proper.

Against H_1 : The Normal Distribution fitted to the Self Esteem attribute score is not proper.

Classes	Upper Boundaries	Observed Frequency	Clubbed Observed Freq	Clubbed Expected Freq	oi-ei	(oi-ei) ² /ei
3 & Below	3	1				
3-3.5	3.5	1				
3.5-4	4	11	13	17.78716	-4.787158771	1.288395
4-4.5	4.5	50	50	37.91047	12.08952897	3.855312
4.5-5	5	44	44	50.4466	-6.446603267	0.823815
5-5.5	5.5	34	34	34.44221	-0.442208148	0.005678
5.5-6	6	13	14	14.41356	-0.413558788	0.011866
6 above		1			Test Statistic=	5.985067

Effective no. of classes (k) =5, p=2

Critical Value= 5.991

Conclusion:

- As the calculated test statistic is less than critical value, we accept H_0 .
- Hence normal distribution fitted is proper.
- Hence the difference between expected and observed frequencies is due to sampling i.e. by pure chance.

4)Optimism

Fitting of Normal Probability Distribution

Classes	UB	Frequency	Cumulative probability	Probability	Exp Freq
3 and below	3	1	0.000727779	0.000727779	0.110622
3-3.5	3.5	4	0.012582323	0.011854544	1.801891
3.5-4	4	11	0.097775605	0.085193281	12.94938
4-4.5	4.5	42	0.36324605	0.265470446	40.35151
4.5-5	5	60	0.723991199	0.360745149	54.83326
5-5.5	5.5	25	0.938131369	0.214140169	32.54931
5.5-6	6	9	0.993500739	0.05536937	8.416144
above 6	INF	0	1	0.006499261	0.987888

Mean	4.68516813
Variance	0.28022301
Std Dev	0.52936094

Note:

- In the above Frequency Distribution the classes have lower boundaries excluded, while upper boundaries included.
- No. of parameters estimated for fitting the Distribution are 2.

Testing Goodness of Fit

To test H_0 : The Normal Distribution fitted to the Self Esteem attribute score is proper.

Against H_1 : The Normal Distribution fitted to the Self Esteem attribute score is not proper.

Classes	Upper Boundaries	Observed Frequency	Clubbed Observed Freq	Clubbed Expected Freq	oi-ei	(oi-ei) ² /ei
3 and below	3	1				
3-3.5	3.5	4				
3.5-4	4	11	16	14.861892	1.138108083	0.087155122
4-4.5	4.5	42	42	40.351508	1.648492274	0.06734635
4.5-5	5	60	60	54.833263	5.166737362	0.486842724
5-5.5	5.5	25	25	32.549306	-7.549305743	1.750944172
5.5-6	6	9	9	9.404032	-0.404031976	0.017358707
above 6	INF	0			Test Statistic	2.409647076

Effective no. of classes (k) =5, p=2

Critical Value= 5.991

Conclusion:

- As the calculated test statistic is less than critical value, we accept H_0 .
- Hence normal distribution fitted is proper.
- Hence the difference between expected and observed frequencies is due to sampling or by pure chance.

5)Resilience

Fitting of Normal Probability Distribution

Classes	UB	Observed Frequency	Cumulative probability	Probability	Expected Frequencies
Below 1	1	0	0.000778708	0.000778708	0.125372058
1--2	2	3	0.013577363	0.012798655	2.060583423
2--3	3	17	0.104774544	0.09119718	14.68274604
3--4	4	45	0.38196418	0.277189637	44.6275315
4--5	5	50	0.743493677	0.361529497	58.20624902
5--6	6	46	0.946151805	0.202658128	32.62795863
6 & above	INF	0	1	0.053848195	8.669559324
		161		1	161

Sample Mean	4.31464897
Sample Variance	1.09765595
Sample SD	1.04769077

Note:

- In the above Frequency Distribution the classes have lower boundaries excluded, while upper boundaries included.
- No. of parameters estimated for fitting the Distribution are 2.

Testing Goodness of Fit

To test H_0 : The Normal Distribution fitted to the Self Esteem attribute score is proper.

Against H_1 : The Normal Distribution fitted to the Self Esteem attribute score is not proper.

Observed Frequency	Expected Frequencies	Pooled Observed Frequencies	Pooled Expected Frequencies	$((o_i - e_i)^2)/e_i$
0	0.12537206			
3	2.06058342			
17	14.682746	20	16.86870153	0.581255772
45	44.6275315	45	44.6275315	0.003108682
50	58.206249	50	58.20624902	1.156963798
46	32.6279586	46	32.62795863	5.480314978
0	8.66955932	0	8.669559324	8.669559324
161				15.89120255

k=5	p=2		Critical Value=	5.991464547
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Conclusion:

- As the calculated test statistic is less than critical value, we accept H_0 .
- Hence normal distribution fitted is not proper.
- Hence the difference between expected and observed frequencies is significant and not due to sampling.

INFERENCES FROM THE DISTRIBUTIONS FITTED

- 90% of the people in our population have Wellness level between 3.6845 & 5.4185.
- 90% of the people in our population have Happiness level between 3.4556 & 5.7273.
- 90% of the people in our population have Self Esteem level between 3.7366 & 5.6915.
- 90% of the people in our population have Optimism level between 3.8144 & 5.5558.

CONCLUSIONS

Conclusions

1. The attributes are positively correlated, which means that an increase in Happiness will cause an increase in Self Esteem, Resilience, Optimism and Wellness Overall.
2. As exercising hours increase, the level of Happiness is found to increase.
3. Self Esteem, Resilience and Optimism are not affected due to Exercising.
4. Income has no significant effect on any attribute.
5. The Body Mass Index which gives the measure of fitness of an individual has a positive effect on Resilience and Overall Wellness. It does not affect Happiness, Self Esteem and Optimism.
6. The number of working hours of individuals from different working professions does not affect their level of Happiness, Self Esteem, Resilience, Optimism and Wellness.
7. People who sleep more during the day are at a lesser level of Overall Wellness which means that one should sleep less during the day.
8. There is no effect of Gender of an individual on his/her level of Happiness, Self Esteem, Resilience, Optimism and Wellness.
9. There is no effect of educational status of an individual on his/her level of Happiness, Self Esteem, Resilience, Optimism and Wellness. This was tested between Undergraduates and PhDs.
10. There is no effect of Profession of an individual on his/her level of Happiness, Self Esteem, Resilience, Optimism and Wellness when tested between Housewives and Managers.

11. Happiness, Self Esteem, Optimism and Wellness follow Normal Distribution. Resilience is the only attribute that does not follow Normal Distribution.
12. 90% of people have scores on the positive side of Happiness, Self Esteem, Optimism and Wellness.

LIMITATIONS

Limitations

1. Data collection was one of the biggest challenges and limitations in front of us. In the first phase of data collection, most of the people did not return the questionnaires that were given to them.
2. The questionnaire was in **English**. As a result people who do not understand the language were hard to be incorporated in our report.
3. As a result of Pt. 2, we ended up with a sample size that is very small. We collected data from 160 people and some of the categories which were expected to contribute a lot of people did not offer any.
4. The length of the questionnaire is such that though it is interesting but people tend to miss a number of important questions in between.
5. Not a lot of people are interested in revealing their financial status.
6. Many people misinterpreted the 10th question of third scale.
7. In a number of cases we got a feedback from people that they tend to pose an image that is not exactly theirs. This tendency in a way kills the soul of our research.

REFERENCES

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