The lifestyle of youth in Pakistan: Impact of lifestyle factors on the depressive behavior of youth

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Article Information	Abstract
	The dominance of depression is common in youth of Pakistan, and it is essential to alleviate it as they are nation builders. There are probablysome lifestyle factors are intensifying depression. This research is intended to assess which lifestyle factors are leading to depression and are to be controlled to assassinate it so that adolescents can enjoy a happy and healthy life both mentally and physically. This study is based on an online random sample of 340 subjects, the majority female within the age group 18-25. Data collection was done using structured questionnaire to evaluate lifestyle of youth and modified version of the Patient Health Questionnaire (PHQ-9) is used to analyze severity of depression. KNN, SVM, Decision tree and Logistic regression are used for machine leaning analysis and Pearson's chi-squared statistical hypothesis, Cramer's V Statistic, Spearman rank correlation statistic and proportion testing with z-statistics are used for statistical analysis. It has been found that water intake ($p=0.03<0.05$), sleep duration ($p=0.02<0.05$), occupational satisfaction level ($p=0.03<0.05$), and social media usage ($p=0.02<0.05$) are the lifestyle factors that are dependent on depression. Controlling these factors i.e. drinking 6-8 glasses of water/day, sleeping 6-8 hours/day, high occupation satisfaction and less social media usage assists in reducing depression.

Introduction

Adolescents are an asset of a population and it is significant to examine and unravel their health and lifestyle complications. Unhealthy behaviours (intake of fast food and soft drinks, smoking and usage of other addictive products and physical inactivity) arises anxiety among teenagers and make them idealize suicide and other abusive acts like fighting and being aggressive (Rao, Shah, Jawed, Inam, & Shafique, 2015). A cross-sectional study was conducted on students of 12 randomly selected schools of Lahore, Karachi, and Quetta, six from each (3 private and 3 public) to investigate factors associated with self-perceived health. 29% of youngsters perceived that their health was poor and reasons behind this perception were less father income, living in large family, partial treatment by parents, and lack of parent-child communication. Therefore, parent counseling, enhanced employment opportunities for father and awareness about healthy diet among individuals can effectively reduce adolescent stress

(Afridi et al., 2013). Physical inactivity and unhealthy eating is making the youngsters obese, leading to health risks, so widespread efforts are needed to prevent it. A cross-sectional study was conducted on a random sample of 504 minors to analyze the rea- sons for abnormal weight gain. It was deduced that males are 67% more probable of being obese than females because boys have more chances of dining out. It was also concluded that people belonging to middle social class were expected to be obese as compared to people belonging to lower and upper class and the reason behind it was that upper class people are health conscious and prefer healthy eating whereas lower class people don't have enough income to spend on unhealthy food.

Moreover, who eat fit more than 4 times a week have 55% less probability of becoming obese as compared to those who eat less than 4 times (Hashmi, Soomro, & Saleem, 2013). Depression is one of the most common psychiatric problem prevailing among youngsters. However, the dominance of depressive symptoms vary from gender to gender. A research was conducted to determine individuals' perceptions about their psychological disorders. For this purpose, 52 adolescents with several psychiatric disorders were interviewed, and 67% were female. It was reasoned that males felt more humiliated and concerned about their mental condition thanfemales. The motives leading to mental illness were their emotional state and family issues (Imran, Azeem, Chaudhry, & Butt, 2015). Females are more probable to be victims of depression and have sleeping difficulties as compared to males. Whereas, as a consequence of depression, boys are more inclined to abusive and addictive conduct than females (Imran et al., 2015).

Depression is the root cause of many different diseases. A study was conducted in Hyderabad, Pakistan, on 174 subjects between 18- 25 years of age that aimed to find the association between psychosocial depression and lifestyle blood pressure variations. Body Mass Index (BMI) and blood pressure of each subject were noted and a Depression rating scale was used to assess kind and source of depression. It was concluded that depression leads to many health concerns including cardiovascular complications, obesity and it makes an individual eager to promote crime and unethical conducts in society (Naseer1 et al., 2013). Adolescents suffering from inflammatory bowel disease (IBD) are likely to suffer from different psychological disorders including depression and anxiety (Greenley et al., 2010).

Depression should be abridged so that youth can enjoy a healthy life and live happily, which is very important for the betterment of the country as youngsters are future servers of a country. Depressed people cannot complete their routine tasks efficiently and lose interests in everyday activities. So, it is essential to control factors that may help reduce depression in youth. Research was carried out on a sample of 50 female students who visited clinical psychologists at a university counselling centre in Karachi, Pakistan to find out whether Cognitive Behavioral Therapy (CBT) is effective in getting rid of depression. Level of depression before and after therapeutic sessions was evaluated and it was found that CBT is beneficial for eradicating depression (Malik, Ghafoor, & Naseer, 2011). A -sectional study was carried out on a random sample of 800 school-going students of 10-16 years of age to access factors associated with stress in Nawabshah, Pakistan. Modified version of Perceived Stress Scale was utilized to measure stress. It was concluded that stress level is related to many socioeconomic and demographic factors like parental quarrels, number of siblings, and number of rooms in the house and can be reduced by adjusting these factors. It was also inferred that there was a comparatively low level of stress among female youngsters who had prior knowledge about pubertal body changes than boys (Parpio et al., 2012). According to research conducted in Ireland on 10364 youngsters who were above 18 years of age it was deduced that physically active people, do not smoke and consume alcohol sensibly, and intake adequate amounts of fruits and vegetables are likely to relish good physical and mental health and are

expected to live 14 years longer thus adding quality and quantity to life and have better mental health (Harrington et al., 2010).

It is reported that sunlight has vitamin D, which lessens depressive symptoms (Keller et al., 2005), (Terman & Terman, 2005). People with vitamin D deficiency have more risk of depression (Eyles, Burne, & McGrath, 2013). Research was conducted in South Korea on a sample of 617 middle school students aged 13 to 15. A pre-test/ post-test was designed which was an 8 months education intervention. Depression was measured using Center for Epidemiologic Studies Depression Scale (CES-D). A post test was conducted after controlling the 3 confounders: sunlight exposure 30 minutes/day, no junk food consumption and healthy sleep. It was inferred that depression was reduced by 35% as compared to the pre-test in which sunlight exposure was less than 3 minutes/day, more junk food consumption, sleeping late at night (Choi et al., 2016). These days, adolescents are not interested in exercise and are taking an unhealthy diet (Sarbadhikari & Saha, 2006), (Ali, Khan, & Naseer, 2022). Moreover they are sleep deprived and have reduced sunlight exposure (Wirz-Justice et al., 1996), (Jabeen, Zia, & Naseer, 2021). It has been concluded that these deviations influence the brain's physiology and increase the severity of depression (Zia, Naseer, & Dar, 2021).

A -sectional study was conducted on a sample taken from the Iranian population to study the relationship between lifestyle, depression and anxiety. General Practice Physical Activity Questionnaire (GPPAQ) was used to evaluate the amount of physical activity in subjects and the Iranian-validated version of Hospital Anxiety and Depression Scale (HADS) was applied to screen for anxiety and depression. It was inferred that as age increases chances of depression deceases by 2% every year. It was reasoned that level of education influences depression and anxiety. Graduates have 46% low risk of depression and 56% low risk of anxiety compared to under-graduates.

Minors having less than 1 hour of physical activity per week are 27% more likely to become depressed over time. Marital status has nothing to do with mental health disorders. Worst lifestyle circumstances can victimize single and married people of depression (Cabello et al., 2017). Social status also impacts the level of stress people suffer. According to a study, youngsters having medium to high income were less persistent to depression as compared to people with low income (Ambresin, Bennett, Patton, Sanci, & Sawyer, 2013). A study was conducted to analyze youngsters' attitude towards health care. Eight areas were found to be positive to the youngsters which are availability of proper health care opportunities, friendly and supportive attitude of clinical staff towards them, respectable of communication between staff and adolescents, atmosphere suitable regarding age of patient so that they may feel comfortable, guidelines leading to care, medical capability of doctor so that patients may be optimistic that the will be cured from the treatment, youth interest towards health care and health outcomes. If all the 8 areas will be enhanced than youngsters perception about health care will be positive and the will definitely move towards their proper treatment (Ahmad, Boubakar, et al., 2022), (Naseer et al., 2017).

A research was conducted on 11,800 Spanish university graduates to analyze relation between Mediterranean lifestyle and depression. Mediterranean lifestyle includes eating healthy food like whole grains, fruits and vegetables, they prefer eating with friends and family and they try to live a happy and simple life. A validated questionnaire evaluated the mediterranean diet, physical activity and time spent in socializing. And it was deduced that people devoted to such a lifestyle were at 50% less risk of being depressed as compared to those who are not devoted to Mediterranean life which means such kind of healthy and happy lifestyle helps in reducing depression (Tolmunen et al., 2003), (Ahmad, Ijaz, et al., 2022). Exercising in nature (greenery) and looking at peaceful images and videos of nature act as a remedy to get rid of depression and helps in recovering mental health (Singewald, Sinner, Hetzenauer, Sartori, & Murck, 2004). It was deduced from a recent study that low folate

(vitamin B9) intake, a sort of water soluble vitamin found in green leafy vegetables and fruits, dairy products can also make a person victim of depression (H. Ali et al., 2022). Along with folate, magnesium is effective vitamin that influences certainty of depression. A diet deficient in Magnesium upsurges likelihoods of depression (Ibarra-Rovillard & Kuiper, 2011).

Some people are intimate with animals kept as pets because time spent with them helps refresh the mood. It has been deduced in a recent study that time spent by mentally ill people with animals support in reducing depression (Street, James, & Cutt, 2007). It has been found that person's mental health is affected by social environment. Mental health can be improved by being around positive people who spread positive vibes, people around whom a person feels comfortable and intimated. All these factors help improve depression (Jacka et al., 2012). A recent study conducted in US and Australia found that people having a balance between work, rest and play can enjoy good mental and physical health.

Recreational activities can help soothe mental health and release stress (Ahmad, Cherif, et al., 2022), (Benkirane et al.). Women who intake less than adequate red meat were at high risk of becoming a victim of depression over time (Löwe, Kroenke, Herzog, & Gräfe, 2004). Therefore, a balanced intake of red meat is beneficial to shun depression. It has been found that high caffeine intake (coffee) leads to insomnia, which intensifies chances of depressed mood. Therefore, caffeine use should be balanced to avoid depression (Sarris, O'Neil, Coulson, Schweitzer, & Berk, 2014), (Sandhu, Haider, Naseer, & Ateeb, 2011).

Sample and settings

A questionnaire-based survey was carried out in Pakistan, a developing country in Asia. Task of data collection was carried out in 4 weeks from December 10, 2019 to January 10, 2020. Total 400 individuals were approached via online questionnaire and we got 342 responses. Of these responses, 10 were discarded due to unfinished and empty forms. Response rate of women was less than men. Total 84.5% individuals who participated in our survey were young people aged 18-25. Questionnaire that we used to collect data is composed of two parts (Velusamy et al., 2021). First part has 15 lifestyle related questions and demographic information (age, gender). Second part consists of Patient Health Questionnaire (PHQ-9) (Ahmad, Manzoor, Naseer, Ghaffar, & Hussein, 2021).

Lifestyle

Common lifestyle behaviors include water intake, sleeping habits, fast food consumption and physical activity. These parameters categorize one's life as healthy or unhealthy. It is common knowledge that if a person drinks less than 6 glasses of water or has bad sleeping habits, their lifestyle is unhealthy. We used many lifestyle related parameters to check their relationship with depression. First part of our questionnaire follows lifestyle-related questions; from these questions we have derived our variables (Naseer et al., 2012).

Depression

PHQ-9 is standard depression module which can diagnose patients' depression level by scoring their selected answers. We used this questionnaire to analyze participant's mental health level. The purpose of this module is to check whether people have depression and if they have depression then what is its severity level. There are total 5 depression severity levels Minimal depression, Mild depression, Moderate depression, moderately severe depression and severe depression. Using PHQ-9 scoring algorithm, depression presence for each individual was calculated. The participants who were diagnosed with depression, its severity level was also calculated (Shahzad et al., 2021).

The final form of our dataset has values for every lifestyle factor and two more columns to represent presence of depression (Yes, No) and severity level of depression (1-5). Following

table shows depression related questions and number of selected responses in respective columns.

Table 1: PHQ-9 questionnaire

Statements	Not at all	Nearly every day	Several days	More Than half days
Little interest or pleasure in doing things	67	49	140	55
Feeling down, depressed or hopeless	100	47	118	47
Feeling tired or having little energy	63	48	138	63
Trouble falling or staying asleep, or sleeping too much	111	39	112	50
Poor appetite or overeating	135	35	95	47
Feeling bad about yourself - or that you are a failure or have let yourself or your family down	147	50	76	39
Moving or speaking so slowly that other people could have noticed. Or the opposite- being so fidgety or restless that you have been moving around a lot more than usual	167	33	86	25
Thoughts that you would be better off dead, or of hurting yourself	193	27	69	23

Methodology

Machine learning

Lifestyle factors like water intake, physical activity level and social media usage have a certain impact on human mental level. When these lifestyle factors are given, Machine learning algorithms can be used to predict the presence of depression. In this study Decision tree, Logistic regression, KNN and SVM are used to predict depression. As the data in our final file is categorical and ordinal, one-hot encoding was used to convert this data. All the lifestyle factors were encoded using one-hot encoding, and depression presence was used as a target variable. As depression presence has two options, yes and no, is problem was treated as two class problems. Scikit-learn library of python has built- in models for two class problems. Following table shows that SVM is better at predicting the depression presence in our data.

Table 2: Machine learning algorithms

Model	Accuracy without hyper-parameter	Accuracy with hyper parameter
Decision tree	0.6667	-
Logistic Regression	0.7778	0.7778
KNN	0.7936	0.74603
SVM	0.7619	0.7936

Statistical Analysis

In this study, we performed statistical experiments on data to find associated relations between lifestyle factors and depression. As data is categorical, hypothesis tests like ANOVA and correlation cannot be performed. Categorical data has some specific attributes therefore we performed following tests:

1. Pearson's chi-squared statistical hypothesis

2. Cramer's V statistic
3. Spearman's rank correlation
4. Proportion hypothesis testing
5. Proportion statistical value
6. Confidence interval

Pearson's chi-squared statistical hypothesis

Pearson Chi-square is used to test the relationship of independence between two categorical variables. It assumes that the variables are independent as a null hypothesis and then tests whether the claim is to be accepted or rejected. If the claim is rejected, variables are dependent otherwise independent. It uses frequencies (number of counts of a particular cell) to per- form statistical calculations. We used this test to find the relationship between each lifestyle factor variable and depression. Our hypothesis H_0 shows that two variables are independent. The conclusion is based on 95% confidence interval. If p-value is less than or equal to level of significance than H_0 will be rejected otherwise it will be failed to reject.

Table 3: Results of Pearson's chi-squared statistical hypothesis

Variable	statistics	p-value	dof	Hypothesis test
Physical activity	4.063	0.254	3	Independent (fail to reject)
Occupation	7.631	0.054	3	Independent (fail to reject)
Water intake	11.255	0.003	2	Dependent (reject)
Sleep duration	9.625	0.022	3	Dependent (reject)
Addictive habits	2.247	0.813	5	Independent (fail to reject)
Social media usage	7.320	0.025	2	Dependent (reject)

Cramer's V statistic

Cramer's V statistic is based on Pearson Chi-squared statistical hypothesis and is used to find relationship between two categorical variables. It gives a value between 0 and 1. P-value close to 0 means that the two variables are weakly associated. Statistics value is calculated using a contingency table, also known as a cross table. This table is developed using frequencies of two categorical variables. For example if one variable is gender which has two categories female/male and other one has yes/no options. Their contingency table will be created by counting their frequencies. The following table shows Cramer's V statistical analysis results for our data.

Table 4: Results of Cramer's V statistic

Variable	Statistic value
Occupational physical activity level	0.0
Occupation satisfaction level	0.1113
Breakfast intake	0.0625
Fruits and veg intake	0.0414
Sleep duration	0.1458
Lifestyle balance	0.0485
Lifestyle satisfaction level	0.0671

Spearman's rank correlation

Spearman correlation is used to find monotonic relationship between ordinal values (Discrete or continuous). When ranks of both the variables are same them correlation is high which means they are highly associated.

Table 5: Results of Spearman's rank correlation

Variable	coefficient	p-value	hypothesis test
Occupational physical activity level	0.038	0.504	uncorrelated (fail to reject)

Occupation satisfaction level	0.134	0.018	correlated (reject)
Breakfast intake	0.073	0.199	uncorrelated (fail to reject)
Fruits and veg intake	-0.100	0.077	uncorrelated (fail to reject)
Water intake	0.124	0.028	correlated (reject)
Fast food intake	0.043	0.446	uncorrelated (fail to reject)
Sleep duration	0.086	0.129	uncorrelated (fail to reject)
Social media usage	0.071	0.211	uncorrelated (fail to reject)
Lifestyle satisfaction level	-0.054	0.342	uncorrelated (fail to reject)

Confidence interval

Table 6: Results of confidence interval

Variable	n	p	C.I
Physical activity	312	123/312=0.3785	0.3285 < 0.4312
Job satisfaction level	312	164/312=0.5046	0.4502 < 0.5590
Breakfast intake	312	189/312=0.5762	0.5225 < 0.6229
Fruit and vegetable intake	312	173/312=0.5762	0.4750 < 0.5832
Water intake	312	106/312=0.5762	0.2735 < 0.3749
Sleep duration	312	144/312=0.4417	0.3878 < 0.4856
Social media usage	312	120/312=0.3704	0.3177 < 0.4231

Proportion hypothesis testing

Table 7: Results of proportion hypothesis testing

	n	H_0	H_1	alpha	p	Zcal	Ztab	Test
Social media usage more than 3 hours	312	p=0.1578	p>0.1578	0.05	203/312=0.6506	23.8994	1.645	H_1 Accept, H_0 reject
Less than 6 hour sleep	312	p=0.321	p>0.321	0.05	53/312=0.6506	-5.7206	1.645	H_1 reject, H_0 Accept
Addictive habits	312	p=0.1351	p>0.1351	0.05	37/312=0.1186	-0.8526	1.645	H_1 reject, H_0 Accept
Life satisfaction level	312	p=0.2676	p>0.2676	0.05	71/312=0.2276	-1.5960	-1.645	H_1 reject, H_0 Accept
Fruit and vegetable intake less than 2 times	312	p=0.2282	p>0.2282	0.05	149/312=0.2276	10.4928	1.645	H_1 Accept, H_0 reject
Fast food intake	312	p=0.1803	p¿0.1803	0.05	183/312=0.2276	18.6609	1.645	H_1 Accept, H_0 reject
Physical activity	312	p=0.1927	p>0.1927	0.05	192/312=0.2276	18.9300	1.645	H_1 Accept, H_0 reject
Water intake less than 6 glass	312	p=0.2201	p>0.2201	0.05	209/312=0.2276	19.1764	1.645	H_1 Accept, H_0 reject

Results

The study was conducted on 340 subjects, mostly female (81% females and 19% males). 85% of the subjects were 18- 25%, 12% were 26-35 years of age, and 3% were below

18. The mean age of subjects was 18-25 years. Of the total subjects, 44% of the females and 37% of males were not having depressive disorder. 11% of the females and 8% of the males were found to be suffering from depressive disorder. 69% of the sample from age range 18- 25 were not having a depressive disorder and 16% were suffering from it. 10% of the sample from age range 26-35 were not having depressive dis- order and 3% were suffering from it. 2% of the sample having age below 18 were not having the depressive disorder and 1% suffered from it. Out of 33% of the subjects keeping themselves involved in physical activity 1-2 times/week, 28% were not suffering from depressive disorder and 5% were. Out of 20% of the subjects who kept themselves involved in physical activity 4-5 times/week 15% of the subjects were not suffering from depressive disorder and 4% were. Out of 19% of the subjects who kept themselves involved in physical activity daily, 16% of the subjects were not suffering from depressive disorder and 3% were. Out of 29% of the subjects who had no physical activity in the whole week. 22% of the subjects were not suffering from depressive disorder and 7% were. Out of 43% of the subjects who could not find time for exercise due to their busy routine 6% were depression victims and 37% were not. Out of 33% of the subjects who could not find time for exercise due to their laziness 8% were depression victims and 25% were not. Out of 24% of the subjects who could not find platforms (Parks, gyms etc.) for exercise, 5% were depression victims and 19% were not. Out of 5% of the businessmen, 2% were suffering from depression and 3% were not. Out of 19% of the employees, 2% were suffering from depression and 17% were not. Out of 44% of the subjects having moderate physical activity in their occupation 8% were depressed and 36% were not. Out of 9% of the subjects having intense level of physical activity in their occupation 2% were depressed and 7% were not. Out of 25% of the subjects having slight physical activity in their occupation 6% were depressed and 19% were not. Out of 22% of the subjects having no physical activity in their occupation, 4% were depressed and 18% were not. Out of 49% of the subjects who were highly satisfied from their occupation, 42% were not depressed and 7% were depressed. Out of 43% of the subjects who were less satisfied from their occupation 33% were not depressed and 10% were depressed. . Out of 8% of the subjects who were not satisfied from their occupation 6% were not depressed and 2% were depressed. Of 59% of the respondents who ate breakfast daily, 49% were not depressed and 10% were depressed. Out of 34% of the respondents who took breakfast not on daily basis but sometimes, 27% were not depressed and 7% were depressed. Out of 7% of the respondents who skip breakfast daily 5% were not depressed and 2% were depressed. Out of 45% of the subjects who eat fruits and vegetables 1-2 times/week, 34% were not suffering from depressive disorder and 11% were. Out of 45% of the subjects who eat fruits and vegetables 1-2 times/week, 34% of the subjects were not suffering from depressive disorder and 11% were. Out of 31% of the subjects who eat fruits and vegetables 4-5 times/week, 26% were not suffering from depressive disorder, and 5% were. Out of 21% of the sub- jects who eat fruits and vegetables daily, 18% of the subjects were not suffering from depressive disorder and 3% were. Out of 3% of the subjects who do not eat fruits and vegetables in whole week, all the 3% were not suffering from depression. Out of 67% of the subjects who drink less than 6 glasses of water/day, 25% of the subjects were not suffering from depressive disorder and 15% were. Out of 27% of the sub-jects who drink 6-8 glasses of water/day, 25% of the subjects were not suffering from depressive disorder and 2% were. Out of 6% of the subjects who drink more than 8 glasses of water/day, 4% of the subjects were not suffering from depressive disorder and 2% were. Out of 54% of the subjects who used to take fast food once a week, 45% were not suffering from depressive disorder and 10% were. Out of 32% of the subjects who used to take fast food 2-3times/week, 26% were not suffering from depressive disorder and 6% were. Out of 10% of the subjects who used to take fast food regularly, 7% were not suffering from depressive disorder and 3% were.   Out of 4% of the subjects who do not take fast food in whole week, 3% were not suffering from depressive disorder and 1% were. Out of 45% of the

subjects who slept 6-8 hours daily, 39% were not suffering from depressive disorder and 6% were. Out of 38% of the subjects used to sleep 6-8 hours usually, 30% were not suffering from depressive disorder, and 8% were. Out of 16% of the subjects used to sleep 6-8 hours sometimes, 11% were not suffering from depressive disorder and 5% were. 1% of the subjects who never slept 6-8 hours, was found to be depressed.
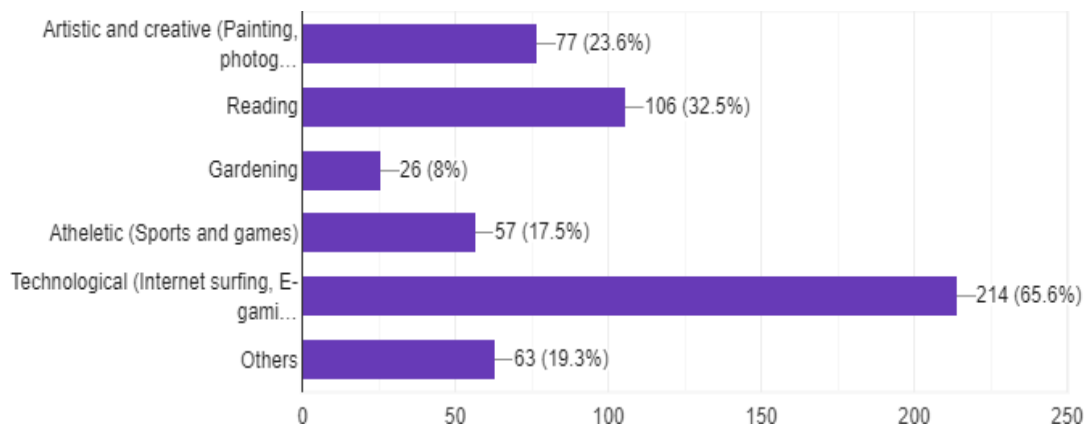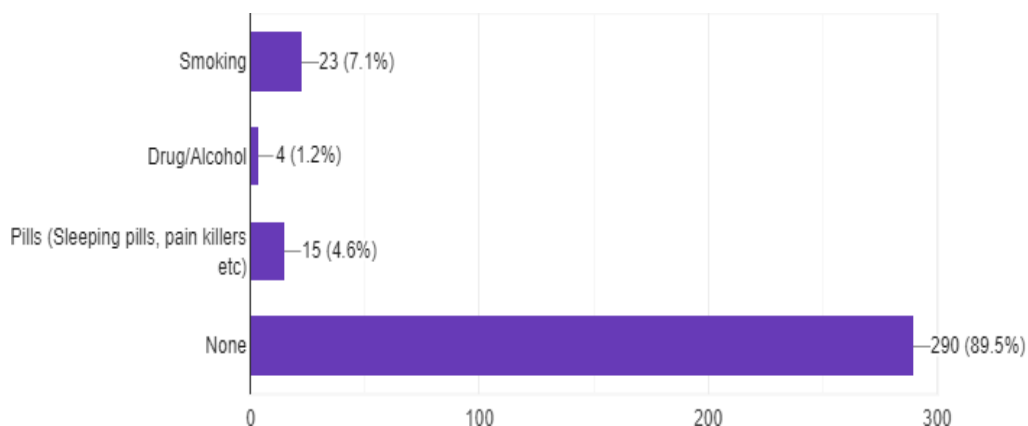

Figure 1: Results for Interest and hobbies

Figure 2: Results for addictive habits
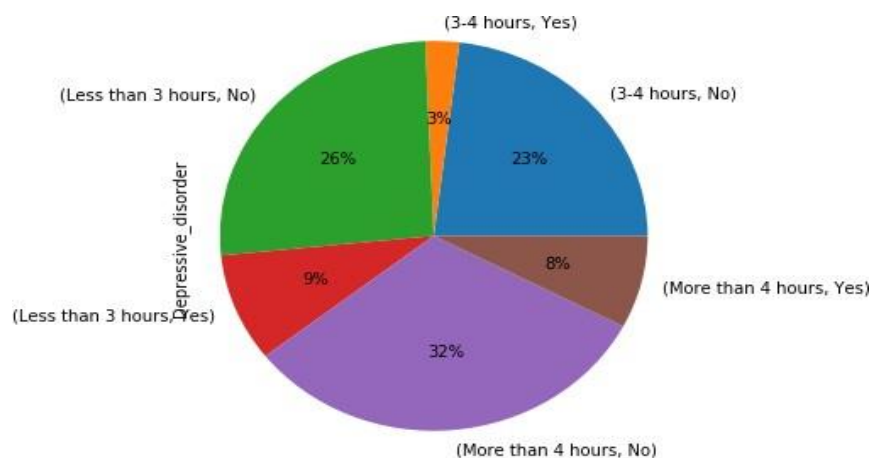
Figure 3: Relation between depressive behavior and fast food consumption
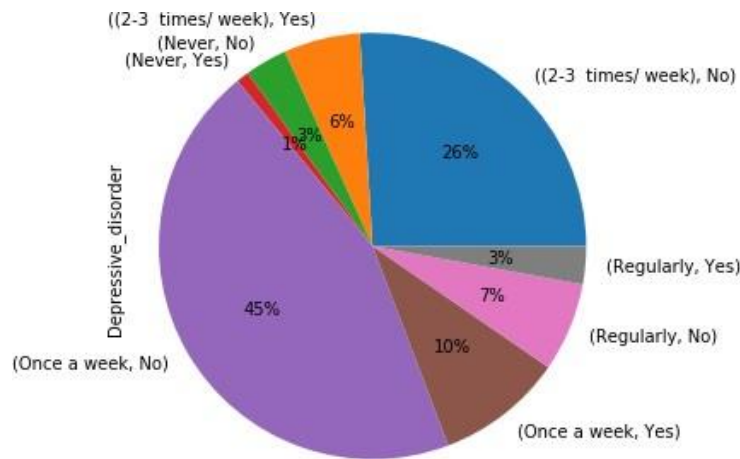
Figure 4: Relation between depressive behavior and social media usage

Discussion

After analyzing the lifestyle factors and their relationship with depression, our results showed that water-intake, sleep duration and occupational satisfaction level strongly correlate. According to research conducted in (Lee, Lee, Liao, & Chiang, 2009), sleep timing plays an important role in preventing depression. Good sleep (6-8 hours) controls mood swings, contributing to good mental health. This relationship between sleep and depression is both ways. Depression cause insomnia (lack of sleep) and less sleep makes the person more depress. Water consumption is associated with better mental and physical health. A study was conducted in Iran to find the association between water intake and depression severity level (Lin et al., 2016). Our results agreed with their conclusion that lower level of depression can be averted with better drinking habits. But when there is severe depression (level 4 and 5), water intake plays no significant impact. To prevent minor depression, there should be basic psychiatric treatments available and the media should promote the good quality water consumption. Spearman's correlation and Cramer's V statistics also showed dependency between occupational satisfaction level and depression presence. Sleep deprivation is directly associated with job satisfaction (Abrar et al., 2021). If a person is not comfortable in his working environment due to bullying, over- working or having bad peer relations, then risk of developing poor mental health increases. Companies should provide a comfortable working environment for their employees and the human resource department should also comply to provide basic needs for people working in their company. Psychiatric help should be available for them as poor mental health reduces productivity of people and slows down their performance in work.

Our results showed that excessive social media usage is another bad habit directly linked with poor mental health in youth. Research conducted in US concluded that poor quality content on social media and fake life of Instagram have a huge impact on people's mental health (Satti et al.). People who use social media more than 4 hours a day have more chances of developing depression and anxiety. Excessive social media uses also hinders one's daily essential tasks.

Conclusion

Results have exposed that water intake, sleep duration, occupational satisfaction level and social media usage are lifestyle factors significantly associated with depression. All these factors need to be organized to diminish depression level in youth. Media (TV shows,

commercials, magazines etc.) and seminars should highlight the significance of adequate water intake (6-8 glasses/day) and healthy sleeping (6-8 hours/day). Youngsters should be provided with better employment opportunities and the workplace environment should be comfortable and supportive. They should be paid well and on time for their hard work. All these elements aid is rising occupational satisfaction level. Social media usage (WhatsApp, Facebook, Twitter etc.) should be balanced. Too much social media usage makes a person cut off from the family. Therefore, by formulating public health intrusions and making them aware of the risk factors, adolescents can be assisted in improving their lifestyle and consequently reducing depression so they can enjoy good mental and physical life. In future, a mobile application based on machine leaning can be developed that can predict whether a person's lifestyle is healthy or not and also level of depression.

References

Abrar, U., Yousaf, A., Jaffri, N. R., Rehman, A. U., Ahmad, A., Gardezi, A. A., . . . Choi, J.-G. (2021). Analysis of Complex Solid-Gas Flow under the Influence of Gravity through Inclined Channel and Comparison with Real-Time Dual-Sensor System. Electronics, 10(22), 2849.

Afridi, A. A. K., Motwani, K., Khawaja, S., Khoja, A. A., Fatmi, Z., Azam, I., & Kadir, M. M. (2013). Self-perceived health among school going adolescents in Pakistan: influence of individual, parental and life style factors? Global journal of health science, 5(4), 71.

Ahmad, S., Boubakar, H., Naseer, S., Alim, M. E., Sheikh, Y. A., Ghaffar, A., . . . Parchin, N. O. (2022). Design of a Tri-Band Wearable Antenna for Millimeter-Wave 5G Applications. Sensors, 22(20), 8012.

Ahmad, S., Cherif, N., Naseer, S., Ijaz, U., Faouri, Y. S., Ghaffar, A., & Hussein, M. (2022). A wideband circularly polarized CPW-fed substrate integrated waveguide based antenna array for ISM band applications. Heliyon, 8(8), e10058.

Ahmad, S., Ijaz, U., Naseer, S., Ghaffar, A., Qasim, M. A., Abrar, F., . . . Abd-Alhameed, R. (2022). A jug-shaped CPW-fed ultra-wideband printed monopole antenna for wireless communications networks. Applied Sciences, 12(2), 821.

Ahmad, S., Manzoor, B., Naseer, S., Ghaffar, A., & Hussein, M. (2021). A Flexible Broadband CPW-Fed Circularly Polarized Biomedical Implantable Antenna With Enhanced Axial Ratio Bandwidth.

Ali, H., Batool, K., Yousaf, M., Islam Satti, M., Naseer, S., Zahid, S., . . . Choi, J.-G. (2022). Security Hardened and Privacy Preserved Android Malware Detection Using Fuzzy Hash of Reverse Engineered Source Code. Security & Communication Networks.

Ali, N., Khan, K. I., & Naseer, S. (2022). Islamic Bank: A Bank of Ethics in Compliance with Corporate Social Responsibility. Sustainable Business and Society in Emerging Economies, 4(2), 295-302.

Ambresin, A.-E., Bennett, K., Patton, G. C., Sanci, L. A., & Sawyer, S. M. (2013). Assessment of youth-friendly health care: a systematic review of indicators drawn from young people's perspectives. Journal of Adolescent Health, 52(6), 670-681.

Benkirane, S., Guezzaz, A., Azrour, M., Gardezi, A. A., Ahmad, S., Sayed, A. E., . . . Shafiq, M. Adapted Speed System in a Road Bend Situation in VANET Environment.

Cabello, M., Miret, M., Caballero, F. F., Chatterji, S., Naidoo, N., Kowal, P., . . . Ayuso-Mateos, J. L. (2017). The role of unhealthy lifestyles in the incidence and persistence of depression: a longitudinal general population study in four emerging countries. Globalization and health, 13(1), 1-8.

Choi, H. Y., Chang, J. J., Wang, J., Roh, N. H., Jeong, H. E., Jung, Y. K., . . . Yoo, H. J. (2016). The pilot study of the relationship between the application with the healthy-habits and depressive scores in youth. Neuropsychiatry, 6(5), 264–270.

Eyles, D. W., Burne, T. H., & McGrath, J. J. (2013). Vitamin D, effects on brain development, adult brain function and the links between low levels of vitamin D and neuropsychiatric disease. Frontiers in neuroendocrinology, 34(1), 47-64.

Greenley, R. N., Hommel, K. A., Nebel, J., Raboin, T., Li, S.-H., Simpson, P., & Mackner, L. (2010). A meta-analytic review of the psychosocial adjustment of youth with inflammatory bowel disease. Journal of pediatric psychology, 35(8), 857-869.

Harrington, J., Perry, I. J., Lutomski, J., Fitzgerald, A. P., Shiely, F., McGee, H., . . . Shelley, E. (2010). Living longer and feeling better: healthy lifestyle, self-rated health, obesity and depression in Ireland. European Journal of Public Health, 20(1), 91-95.

Hashmi, A., Soomro, J. A., & Saleem, K. (2013). Food behaviors and youth obesity in Pakistan. Acta Scientiarum. Health Sciences, 35(2), 223-229.

Ibarra-Rovillard, M. S., & Kuiper, N. A. (2011). Social support and social negativity findings in depression: Perceived responsiveness to basic psychological needs. Clinical psychology review, 31(3), 342-352.

Imran, N., Azeem, M. W., Chaudhry, M. R., & Butt, Z. (2015). Illness perceptions in adolescents with a psychiatric diagnosis in Pakistan. BJPsych Bulletin, 39(4), 174-178.

Jabeen, T., Zia, M. H., & Naseer, S. (2021). Right of Privacy: The Lacuna in Pakistan and Indian legal Framework.

Jacka, F. N., Pasco, J. A., Williams, L. J., Mann, N., Hodge, A., Brazionis, L., & Berk, M. (2012). Red meat consumption and mood and anxiety disorders. Psychotherapy and psychosomatics, 81(3), 196-198.

Keller, M. C., Fredrickson, B. L., Ybarra, O., Côté, S., Johnson, K., Mikels, J., . . . Wager, T. (2005). A warm heart and a clear head: The contingent effects of weather on mood and cognition. Psychological science, 16(9), 724-731.

Lee, M. S.-M., Lee, M.-B., Liao, S.-C., & Chiang, F.-T. (2009). Relationship between mental health and job satisfaction among employees in a medical center department of laboratory medicine. Journal of the Formosan Medical Association, 108(2), 146-154.

Lin, L. Y., Sidani, J. E., Shensa, A., Radovic, A., Miller, E., Colditz, J. B., . . . Primack, B. A. (2016). Association between social media use and depression among US young adults. Depression and anxiety, 33(4), 323-331.

Löwe, B., Kroenke, K., Herzog, W., & Gräfe, K. (2004). Measuring depression outcome with a brief self-report instrument: sensitivity to change of the Patient Health Questionnaire (PHQ-9). Journal of Affective disorders, 81(1), 61-66.

Malik, M. E., Ghafoor, M. M., & Naseer, S. (2011). Organizational effectiveness: A case study of telecommunication and banking sector of Pakistan. Far east journal of psychology and business, 2(1), 37-48.

Naseer1, 2, R., Muneeb1, 2, M., Maheshwari1, 2, S., . . . 4, S. (2013). PSYCHOSOCIAL DEPRESSION AND CARDIOVASCULAR HEALTH; A STUDY ON RISK FACTORS IN HYDERABAD, PAKISTAN. Int J Endorsing Health Sci Res.(IJEHSR), 1, 101.

Naseer, S., Hussain, S., Raza, I., Chaudry, S., Mirza, J., & Raza, M. (2012). Mobile ad-hoc network routing protocols: A simulation and performance analysis using multimedia traffic. Journal of Basic and Applied Scientific Research, 2(10), 9925-9930.

Naseer, S., Liu, W., Sarkar, N. I., Chong, P. H. J., Lai, E., & Prasad, R. V. (2017). A sustainable vehicular based energy efficient data dissemination approach. Paper presented at the 2017 27th international telecommunication networks and applications conference (ITNAC).

Parpio, Y., Farooq, S., Gulzar, S., Tharani, A., Ali, T. S., & Javed, F. (2012). Factors associated with stress among adolescents in the city of Nawabshah, Pakistan. JPMA: Journal of the Pakistan Medical Association, 62(11), 1209.

Rao, S., Shah, N., Jawed, N., Inam, S., & Shafique, K. (2015). Nutritional and lifestyle risk behaviors and their association with mental health and violence among Pakistani adolescents: results from the National Survey of 4583 individuals. BMC public health, 15(1), 1-9.

Sandhu, U. A., Haider, S., Naseer, S., & Ateeb, O. U. (2011). A survey of intrusion detection & prevention techniques. Paper presented at the 2011 International Conference on Information Communication and Management, IPCSIT.

Sarbadhikari, S. N., & Saha, A. K. (2006). Moderate exercise and chronic stress produce counteractive effects on different areas of the brain by acting through various neurotransmitter receptor subtypes: a hypothesis. Theoretical Biology and Medical Modelling, 3(1), 1-18.

Sarris, J., O'Neil, A., Coulson, C. E., Schweitzer, I., & Berk, M. (2014). Lifestyle medicine for depression. BMC psychiatry, 14(1), 1-13.

Satti, M. I., Ahmed, J., Muslim, H. S. M., Gardezi, A. A., Ahmad, S., Sayed, A. E., . . . Shafiq, M. Ontology-Based News Linking for Semantic Temporal Queries.

Shahzad, M. A., Paracha, K. N., Naseer, S., Ahmad, S., Malik, M., Farhan, M., . . . Sharif, A. B. (2021). An Artificial Magnetic Conductor-Backed Compact Wearable Antenna for Smart Watch IoT Applications. Electronics, 10(23), 2908.

Singewald, N., Sinner, C., Hetzenauer, A., Sartori, S. B., & Murck, H. (2004). Magnesium-deficient diet alters depression-and anxiety-related behavior in mice—influence of desipramine and Hypericum perforatum extract. Neuropharmacology, 47(8), 1189-1197.

Street, G., James, R., & Cutt, H. (2007). The relationship between organized physical recreation and mental health. Health Promotion Journal of Australia, 18(3), 236-239.

Terman, M., & Terman, J. S. (2005). Light therapy for seasonal and nonseasonal depression: efficacy, protocol, safety, and side effects. CNS spectrums, 10(8), 647-663.

Tolmunen, T., Voutilainen, S., Hintikka, J., Rissanen, T., Tanskanen, A., Viinamäki, H., . . . Salonen, J. T. (2003). Dietary folate and depressive symptoms are associated in middle-aged Finnish men. The Journal of nutrition, 133(10), 3233-3236.

Velusamy, P., Rajendran, S., Mahendran, R. K., Naseer, S., Shafiq, M., & Choi, J.-G. (2021). Unmanned Aerial Vehicles (UAV) in precision agriculture: applications and challenges. Energies, 15(1), 217.

Wirz-Justice, A., Graw, P., Kräuchi, K., Sarrafzadeh, A., English, J., Arendt, J., & Sand, L. (1996). 'Natural'light treatment of seasonal affective disorder. Journal of Affective disorders, 37(2-3), 109-120.

Zia, M., Naseer, S., & Dar, F. (2021). Assessing the Efficacy of the Concept of Judicial Accountability.

Appendix I. Demographics

	Your gender?
a)	Male
b)	Female
	Your age?
a)	Below 18
b)	18-25
c)	c) 26-35
	In the past year, how often have you been engaged in physical activity?
a)	Daily
b)	(4-5 times/ week)
c)	(1-2 times/ week)
d)	d) (Never)
	What are your personal barriers to exercise?
a)	Laziness
b)	Busy at work
c)	No platform (Park, gym, exercise equipments)
	What is your occupation?
a)	Student
b)	Businessman
c)	Employee
d)	Other
	What level of physical activity your occupation has?
a)	Intense
b)	Moderate
c)	Slight
d)	None
	How much are you satisfied with your occupation?
a)	Highly satisfied
b)	Less satisfied
c)	Not satisfied
	How often do you take breakfast?
a)	Daily
b)	Sometimes
c)	Never
	Do you eat fruits and vegetables?
a)	On daily basis
b)	(4-5 times/ week)
c)	(1-2 times/ week)
	How many glasses of water do you drink daily?
a)	Above 8 glasses
b)	6-8 glasses
c)	Less than 6 glasses
	How often do you eat fast food?
a)	Regularly
b)	(2-3 times/ week)
c)	Once a week

Do you get enough sleep (6-8 hours)? a) Always b) Usually c) Sometimes d) Never
What are your hobbies and interests? (Multiple options can be selected) a) Artistic and creative (Painting, photography and sketching) b) Reading c) Gardening d) Athletic (Sports and games) e) Technological (Internet surfing, E-gaming, Social media etc.) f) Others
What kind of addictive habits do you have? a) Smoking b) Drug/Alcohol c) Pills (Sleeping pills, pain killers etc.) d) None
How much time do you spend on social media (Facebook, Instagram, WhatsApp, Twitter etc.)? a) More than 4 hours b) 3-4 hours c) Less than 3 hours
Do you have a sensible balance between rest, work and play? a) Yes b) No