

APPLICATION OF AI IN ANALYSES OF MENTAL HEALTH ISSUE OF YOUTH OF AHMEDABAD CITY

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Abstract

In this study, we aimed to define the different problems related to mental health of youth. A healthy and balanced youth is imperative for the development of the country and mental health is very important for a balanced life as they face physical, emotional and social changes during this period. During this time they think about education, job, relationships and life goals, which can often cause mental pressure. Mental health is a person's ability to manage life's challenges, reach their full potential, study and work effectively, and give back to their community. One of the fundamental rights of every person is mental health. Chi-square test, Z-test and ANOVA were used to analyse the data. The results showed that Male and females both have almost the same level of depression, females fight without reason, females face more problems about anxiety and nervousness for new work. Total 71.12% of respondents feel anxious, restless and nervous about doing new work. 63.66% of respondents share his feelings with their friends when they are upset or distracted. Further research is needed on some remaining demographic factors and mental health impacts.

Artificial intelligence (AI) has the potential to reshape mental health care by offering personalized, efficient, and accessible care to patients. AI tools can provide accurate diagnosis, treatment recommendations, and offer a platform for psychotherapeutic interventions. Various machine learning algorithms for prediction, accuracy, detection, temporal model, speech processing, robotics and automated decision-making has been used in the development of mental health care.

Keywords: Artificial intelligence, Mental health, Healthcare, Stress, Depression, Demographic factors, Statistical Analysis, Hypothesis, Chi-square test, Z-test, ANOVA,

INTRODUCTION & LITERATURE REVIEW

Mental health conditions include mental disorders and psychosocial disabilities as well as other mental states associated with significant distress. When our true health is out of balance, illnesses occur. Mental health is very important for overall health. A person's health includes mental, emotional, and physical health. A person's ability to succeed at work, build relationships with others, and overcome problems depends entirely on their thoughts and health. Mental health is important at every stage of life, including childhood, adolescence, and adulthood. Their relationships with friends and the structure of their family life are also important factors. Artificial Intelligence (AI) is being used nowadays for recognising various types of mental disorder and their symptoms. The AI motion sensors improve the result of anxiety symptom detection

There are many signs that can be seen in people with mental health problems, such as depression, anxiety, restlessness, and nervousness about doing new work, sleep habits, fights without reason, angry temper, emotional nature. People with mental illness have the ability to succeed at work, fulfill their potential, solve life's problems, and contribute to society.

Bhanita, Kalita (Oct 2023)[1], aimed to investigate the impact of mental wellness in our life. She says that our interaction, behaviours and thoughts are influenced by our mental health. The objective of the study was to study the importance of good mental health of youths and preserving mental health in youth. Study was conducted by using an analytical method through secondary data. The study found that mental health is very important for our peaceful life. For better mental health, regular exercise, healthy food, enough sleeping habits and concentrating on the goal is necessary. The study concluded that a person's capacity to use their cognitive and affective abilities is an indicator of their mental health, which is a state of psychological and emotional well-being.

Makwana, Pallavi (2023) [2], aimed to investigate the mental health of college students and effects of education on their mental health. The objective of the study was to check mental health towards gender and education level. The data was collected from 120 college students equally distributed boys and girls and analyzed through F-test. The study concluded that The boy's college students group is having better mental health than the girl's college students group and The graduate student's group is having better mental health than the post-graduate student's group.

Nag, Anindya (2023) [3], conducted a study for Application of Artificial Intelligence in Mental Health. The objective of the study was to identify current relationships between mental illness and latent variables. The study found that by the means of AI, insights are derived from data that might help to facilitate diagnosis and

treatment. Depression detection via a place of job software program monitoring or wearables might cost individuals their assets of employment or result in higher coverage charges. Virtual wellness tools generally tend to have excessive drop-out prices, as only a small phase of users frequently comply with treatments using mobile applications.

Ramana, Vijaya (2023) [4], conducted a study on School Mental Health Program in India— Issues and Possible Practical Solutions. The objective of the study was to spread awareness about school mental health programs in India. The study found possible barriers to implementing a school mental health program. A study concluded that in Gujarat, mental health screening should be incorporated into the school health program protocol. The study shows that screening needs to be done with the involvement of the family, school, and community and requires a transformed mental health system. In India, we may not be ready for this as yet. We also do not have screening tools that are acceptable for use all over the country. The study concluded that Children and adolescents need nurturing, and their mental health is a shared responsibility of all stakeholders, including parents, school authorities, society, governments, and policymakers.

SIGNIFICANCE OF THE STUDY

Mental health of youth using AI is important in today's world because it has a huge impact on many aspects of our lives. Our interactions, behaviors, and thoughts are all controlled through AI. It encourages us to overcome obstacles, create deeper connections, and make conscious decisions. Taking care of our health not only makes it easier for us to do our daily activities, but it can also help us prevent or control some health problems of the body that are associated with mental problems. Teens will feel better about themselves when they learn to control their behavior or stay calm in difficult or sensitive situations. You can improve their health by learning how to deal with life's little stressors before they become big problems and by facing stressors instead of running away from them.

RESEARCH METHODOLOGY

Random sampling methods have been used for the study. preparing well structured questionnaires. The population for the study consists of youth, who live in Ahmedabad city. randomly 644 responses have been collected. For the analysis purpose Excel and SPSS are used. The analysis is classified into two parts that are descriptive statistics and test hypotheses. Under descriptive statistics tabulations are used, while under statistical tests Chi-square, z-test and ANOVA are used.

3.1 Objectives of the study

This research paper originated with the view of studying the effect of various demographic factors on the mental health of youths living in Ahmedabad city. The various factors (parameters) of mental health like - depression, anxiety, sleeping pattern, focusing while working, stress management, etc are to be measured and then the concluding remark is to be obtained through statistical analysis.

We are using various demographic factors e.g., expressing their feelings, depression when approaching new tasks, feelings of anxiety, restlessness, nervousness about doing new work, difficulty getting sound sleep, the ability to focus on tasks, fights without reason, who individuals communicate with when they are upset or distracted, the factors causing mental stress, feeling like crying, an angry temper, emotional nature, feelings of depression, the ability to express feelings.

3.2 Research Statement

There is no significant difference between Gender and various demographic factors on mental health.

There is no significant difference between Age and various demographic factors on mental health.

There is no significant difference between Education and various demographic factors on mental health.

3.3 Data Presentation

As our study we focus on various demographic factors expressing their feelings, depression when approaching new tasks, feelings of anxiety, restlessness, and nervousness about doing new work, difficulty getting sound sleep, the ability to focus on tasks, fights without reason, who individuals communicate with when they are upset or distracted, the factors causing mental stress, feeling like crying, an angry temper, emotional nature, feelings of depression, the ability to express feelings. We tabulate the data through gender wise, age wise and Education wise. We have taken the view of respondents on various demographic factors.

Table -1 Demographic Information of the respondents

Particulars	Frequency	%
Gender		

Male	346	53.73
Female	298	46.27
Total	644	100.00
Education		
HSE	212	32.92
UG	280	43.48
PG & Other	152	23.60
Total	644	100.00
Age		
18-22	469	72.83
23-27	97	15.06
28 & >	78	12.11
Total	644	100.00

Table - 2 View of respondents on various demographic factors in %

	Factor	Gender		Education			Age		
		Male	Female	HSE	UG	PG & Other	18-22	23-27	28 & More
Depressed about New Task	Yes	10.25	9.47	7.3	7.76	4.66	14.6	3.11	4.35
	Sometimes	15.99	17.08	10.71	14.75	7.61	25.31	5.12	6.52
	No	27.48	19.72	14.91	20.96	11.33	32.92	6.83	10.09
feel anxious, restless and nervous	Yes	12.73	15.53	10.09	11.65	6.52	19.41	5.28	7.14
	Sometimes	21.58	21.27	13.35	20.19	9.32	32.61	5.28	7.76
	No	19.41	9.47	9.47	11.65	7.76	20.81	4.5	6.05
difficulty to get sound sleep	Yes	12.73	15.53	7.3	8.85	4.97	14.13	3.73	4.97
	Sometimes	21.58	21.27	9.94	13.82	7.46	21.27	5.59	8.39
	No	19.41	9.47	15.68	20.81	11.18	37.42	5.75	7.61
focus on every task	Yes	15.99	15.99	10.4	13.51	8.08	22.05	6.52	8.69
	Sometimes	19.25	15.84	12.27	16.46	6.36	27.48	4.35	6.06
	No	18.48	14.44	10.25	13.51	9.16	23.29	4.19	6.21
fight with someone for no reason	Yes	4.97	9.16	5.28	5.59	3.26	10.25	2.17	3.26
	Sometimes	15.06	14.6	7.76	14.75	7.14	19.88	5.75	7.92
	No	33.7	22.52	19.88	23.14	13.19	42.7	7.14	9.78
mind is upset/distracted, I communicate with	Family members	13.51	14.75	9.47	10.87	7.92	19.25	3.26	5.90
	Friends	35.4	28.26	20.96	29.19	13.51	48.14	10.25	13.36
	Teachers	0.62	0.31	0.16	0.78	0.00	0.78	0.16	0.16
	Social or religious	4.19	2.95	2.33	2.64	2.18	4.66	1.4	1.56
angry temper	Yes, often	11.18	13.2	8.54	10.09	5.74	17.86	4.19	5.12
	Sometimes	22.98	23.76	13.2	22.67	10.87	32.45	7.3	10.72
	No, I am calm.	19.57	9.32	11.18	10.71	6.99	22.52	3.57	5.12
emotional nature	don't know	4.19	2.64	2.48	3.11	1.25	5.59	0.47	1.09
	No	5.28	2.33	2.95	3.73	0.93	5.9	1.24	1.55

	yes emotional in every situation	11.96	14.13	6.83	11.96	7.30	17.55	4.66	6.52
	Yes, but it depends on time	32.3	27.17	20.65	24.69	14.13	43.79	8.7	11.81
feeling depressed	Yes	6.83	8.7	5.43	6.06	4.04	10.09	3.73	4.51
	Sometimes	23.29	20.5	12.73	20.5	10.56	32.61	6.21	8.85
	No	23.6	17.08	14.75	16.93	9.00	30.12	5.12	7.60
express your feelings	Yes	15.22	12.73	8.85	11.34	7.76	18.94	4.66	6.68
	Sometimes	26.55	25	16.3	23.6	11.64	38.66	7.3	10.10
	No	11.96	8.54	7.76	8.54	4.20	15.22	3.11	4.20

Table - 3

When my mind is upset/distracted, I communicate with __?				
	Friends	Family members	Religious & Teachers	Total
Male	35.40	13.51	4.81	53.73
Female	28.26	14.75	3.26	46.27
Total	63.66	28.26	8.07	100.00

The table-3 shows that 63.66% of respondents share his feelings with their friends. The table shows that the highest 35.40% male share his feelings with their friends when they are distracted and lowest 3.26% female share her feelings with their relatives, religious and teachers. This shows that females are hesitating to share her feelings.

Table - 4

Do you feel depressed about a new task?			
	Yes	No	Total
HSE	18.01	14.91	32.92
UG	22.52	20.96	43.48
PG & Other	12.27	11.34	23.60
TOTAL	52.80	47.20	100.00

The table-4 shows that 52.80% of respondents feel depressed about a new task. Highest 22.52% Undergraduate people gave the answer "Yes" which shows that undergraduate people are confused and feel depressed about new tasks. Lowest 11.34% Postgraduate people do not feel depressed about new tasks.

Table - 5

Do you feel anxious, restless and nervous about doing new work?			
	Yes	No	Total
18-22	52.02	20.81	72.83
23-27	10.56	4.50	15.06
28 & More	8.54	3.57	12.11
TOTAL	71.12	28.88	100.00

The table-5 shows that 71.12% of respondents feel anxious, restless and nervous about doing new work. Highest 52.02% respondents from the age group "18-22" who gave the answer "Yes" which shows that young people feel anxious and nervous about doing new work. Lowest 3.57% respondents from the age group "28 & More" who gave the answer "No" which shows that mature people do not feel anxious and nervous about doing new work.

STATISTICAL ANALYSIS

The collected data was analysed and processed through Excel 10. We have used descriptive statistics and statistical tests Z-Test for numeric data, Chi-square test for attribute type data and ANOVA for two or more

group data based on data collected from youth. We have verified the various statements at a 5% level of significance for demographic factors and mental health of youth.

Table - 6 Z-Test for analysis of Mental Health

Sr. No.	Null Hypothesis	Z _c	Z _t	Decision	Conclusion
1	There is no significant difference between gender and depression while approaching new tasks.	0.84	1.96	H ₀ is accepted	Male and female have almost the same level of depression while performing new tasks.
2	There is no significant difference between gender and feelings of anxiety, restlessness, and nervousness about doing new work.	2.00	1.96	H ₀ is rejected	Hence we conclude that there is a statistically significant difference between Gender and feelings of anxiety, restlessness, and nervousness regarding the new work. Based on the data, females are facing more problems with anxiety and nervousness for new work.
5	There is no significant difference between the proportion of males and females who fight without reason.	1.53	1.96	H ₀ is accepted	Hence we conclude that males and females are in equal proportion who fight without reason.

Table - 7 Chi-Square Test for analysis of Mental Health

Sr. No.	Null Hypothesis	χ _c ²	χ _t ²	Decision	Remarks
4	There is no significant difference among gender and the ability to focus on tasks.	1.76	5.99	H ₀ is accepted	Hence we conclude that the ability to focus on a task between males and females are almost equal. Both have skill and are able to focus on tasks.
6	There is no significant difference between gender and who individuals communicate with when you are upset or distracted.	3.88	5.99	H ₀ is accepted	Gender does not have a significant effect on who individuals turn to for communication when they are upset or distracted.
7	There is no significant difference between gender and the factors causing mental stress.	2.11	7.82	H ₀ is accepted	Indicating that the factors causing mental stress do not differ significantly between males and females. The findings suggest that the factors causing mental stress are similar across the genders.
8	There is no significant difference between gender and feeling like crying.	92.74	11.07	H ₀ is rejected	There is a significant difference in the tendency to feel like crying between males and females, with females exhibiting a greater tendency to experience emotional distress.
9	There is no significant difference between gender and an angry temper.	21.12	5.99	H ₀ is rejected	The results of this study provide evidence for a statistically significant difference in the prevalence of an angry temper between males and females. From the data it is observed that males exhibit a higher prevalence of an angry temper compared to females
10	There is no significant difference between gender and emotional nature.	9.53	5.99	H ₀ is rejected	This study provides evidence for a statistically significant difference in emotional nature between males and females. The results imply that females are socialized to be more emotionally expressive, while males are socialized to be more emotionally reserved.

12	There is no significant difference between gender and the ability to express feelings.	1.82	5.99	H ₀ is accepted	This suggests that both males and females have a similar ability to express their feelings, and that gender does not have a significant impact on an individual's ability to effectively communicate and express their emotions.
15	There is no significant difference between education and difficulty getting sound sleep	0.0095	5.99	H ₀ is accepted	This suggests that individuals with different educational backgrounds experience similar levels of difficulty in getting sound sleep, and that education level does not have a significant impact on an individual's sleep quality.
17	There is no significant difference between education and fighting without reason.	2.5218	5.99	H ₀ is accepted	This suggests that individuals with different educational backgrounds exhibit similar tendencies towards engaging in fights without reason, and that education level does not have a significant impact on an individual's propensity for unprovoked conflict.
25	There is no significant difference between age and depression when approaching new tasks.	7.3170	5.99	H ₀ is rejected	This suggests that age has a significant impact on an individual's emotional response to novel challenges, with 18 to 22 age groups experiencing higher or lower levels of depression when faced with new tasks.
27	There is no significant difference between age and difficulty getting sound sleep	9.5653	5.99	H ₀ is rejected	This suggests that age has a significant impact on an individual's ability to get sound sleep, with 18 to 22 age groups experiencing more or less difficulty getting restful sleep.
28	There is no significant difference between age and the ability to focus on tasks.	12.420	9.49	H ₀ is rejected	This suggests that age has a significant impact on an individual's cognitive ability to concentrate and attend to tasks, with 18 to 22 age groups exhibiting better or worse focus.
30	There is no significant difference between age and who individuals communicate with when you are upset or distracted.	18.760	9.49	H ₀ is rejected	This suggests that age has a significant impact on an individual's preference for seeking support from specific individuals, such as family members, friends, or romantic partners, when experiencing emotional upset or distraction.
36	There is no significant difference between age and the ability to express feelings.	3.8214	9.49	H ₀ is accepted	This suggests that age does not have a significant impact on an individual's capacity to articulate and communicate their emotional experiences, and that individuals across different age groups exhibit similar levels of emotional expressiveness.

Table - 8 F-Test (ANOVA) for analysis of Mental Health

Sr. No.	Null Hypothesis	F _t	F _c	P	Decision	Conclusion
16	There is no significant difference between Education and the ability to focus on tasks.	5.14	16.0837	0.0039	H ₀ is rejected	Education level has a significant impact on the ability to focus on a task. Results show that educated people can focus on tasks.

18	There is no significant difference between Education and who individuals communicate with when you are upset or distracted.	5.14	0.3351	0.7279	H ₀ is accepted	Education level does not have a significant impact on individuals who communicate when they are upset or distracted.
21	There is no significant difference between education and an angry temper.	5.14	1.5700	0.2622	H ₀ is accepted	Education level does not have a significant impact on having an angry temper.
22	There is no significant difference between education and emotional nature.	5.14	0.05170	0.6265	H ₀ is accepted	Education level does not have a significant impact on emotional nature. This implies that individuals with higher education levels may differ in their emotional expression.

CONCLUSION

As per study suggests that we can say that men do not feel depressed about new work. Male are ready to take more risks compared to female respondents. Men do not feel anxious, restless and nervous about doing new work. Females face more problems with anxiety and nervousness for new work, females have many other responsibilities then they can't concentrate on new work. Females fight without reason with people because sometimes females face imbalances in their relationships or social context. The tendency to feel like crying between males and females, with females exhibiting a greater tendency to experience emotional distress. Males exhibit a higher prevalence of an angry temper compared to females. Because male have more responsibility for the family. Females are socialized to be more emotionally expressive, while males are socialized to be more emotionally reserved. Males can't express his emotions while females can express her emotions.

Here we conclude that age has a significant impact on an individual's preference for seeking support from specific individuals, such as family members, friends, religious and teachers, when experiencing emotional upset or distraction. Most of the respondents shared their emotions with friends. Age has a significant impact on an individual's emotional response to novel challenges, with 18 to 22 age groups experiencing higher or lower levels of depression when faced with new tasks. ability to get sound sleep, with 18 to 22 age groups experiencing more or less difficulty getting restful sleep. ability to concentrate and attend to tasks, with 18 to 22 age groups exhibiting better or worse focus.

Here we conclude that higher education levels may be more effective in expressing their emotions, or vice versa. Focus of the person depends on the education level. Educated people can focus more on work compared to illiterate people. Respondents of different educational backgrounds experience similar levels of difficulty in getting sound sleep, and that education level does not have a significant impact on an individual's sleep quality. Education level has a significant impact on emotional nature. This implies that individuals with higher education levels may differ in their emotional expression.

As per study we conclude that younger youth 18-22 age groups reported higher levels of anxiety and depression compared to older youth. All people have a different level of mental stress but Female youth have a higher rate of depression and anxiety than male youth. Higher education levels youth have better mental health. People can reduce their stress level by using different techniques and methods. Good mental health is connected to better academic performance. Mental health also affects the ability to form and maintain healthy relationships and develop essential social skills.

AI in Mental Health Diagnosis : AI can improve treatment planning by predicting an individual's response to various interventions. For instance, AI models have been effective in diagnosing mental health disorders such as cognitive impairment, schizophrenia, and bipolar disorders, with accuracy rates ranging from 21% to 100%. "Given the increasing use of AI in health care, it is relevant to assess the current status of the application of AI for mental health research to inform about trends, gaps, opportunities and challenges," says Dr David Novillo-Ortiz, Regional Adviser on Data and Digital Health at WHO/Europe, and co-author of the study.

5.1 Limitation of the study

1. The main limitation of the research was we have collected responses from only Ahmedabad city.
2. We have used some demographic factors then it's needed to survey on other remaining demographic factors.
3. We have collected responses for youth only.
4. The sample size of the respondents may not be representative of the entire population of Ahmedabad city.
5. The study relied on self-reported data of respondents.
6. The study relied on the Random sampling method and out of respondents data some data are missing & some data are mismatched.

7. Different types of AI tools can be used for diagnosis.

5.2 Scope of the study

1. A survey to investigate the mental health impacts of the pandemic on healthcare professionals.
2. A survey to investigate the relationship between physical activity and mental health outcomes.
3. Investigate strategies to prevent mental health disorders.
4. Mental health awareness campaigns and community outreach programs.
5. Investigating the availability, accessibility and utilization of mental health services among youth.
6. Impact of Social media and online harassment on mental health among youth.
7. Developing different types of AI models. .

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