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Evaluation of Mental Health of Polytechnic Students through Correlation Analysis in SPSS

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Abstract: ***Mental health among students has become increasingly emphasized in educational research, especially among institutions that provide technical and vocational education, such as polytechnics. Polytechnic students who pursue practical and skill-based learning frequently have particular challenges regarding family background, skill development, academic achievement, and job placement. These pressures, along with societal and personal obstacles, can have a major effect on their mental health. Research on polytechnic students in particular is lacking, despite the increased awareness of mental health concerns in higher education. Current research frequently concentrates on college students, which leaves a significant knowledge vacuum about the unique mental health requirements of students enrolled in technical and vocational programs. To close this gap, this study uses correlation analysis and descriptive statistics to evaluate the mental health of polytechnic students. Students' mental health states are summarized and given an overview using descriptive statistics, and relationships between academic workload, social support, and mental health outcomes are investigated using correlation analysis.***
Keywords: Statistical Package for Social Science (SPSS), Descriptive Statistics, Correlation analysis, Mental health Assessment, Polytechnic Students, Quantitative Research, Factor Analysis, Regression Analysis, Chi-Square Test

I. INTRODUCTION

Even though mental health has grown in importance to students' overall well-being, it is still a topic that is frequently disregarded, especially in polytechnic colleges. Students at polytechnics who seek technical and vocational education have distinct challenges that could lead to elevated stress levels and mental health issues. A more practical, skill-intensive learning environment that requires both academic and practical ability is frequently presented to these students. Many polytechnic students come from lower-income families, and their socioeconomic backgrounds are more varied than those of B.Tech students. Several polytechnic students may also have to juggle their education with part-time employment or family obligations, which exacerbates their stress levels and mental health issues.

The sometimes limited availability of mental health resources and support networks within polytechnic institutions is another significant factor contributing to mental health issues among students. Unlike universities, which often provide extensive counseling services, student well-being programs, and mental health initiatives, polytechnics may lack the infrastructure necessary to meet the psychological needs of their students. Anxiety, despair, and burnout are examples of mental health conditions that can impair a student's academic performance and general quality of life. By applying statistical methods including correlation analysis and descriptive statistics, this study seeks to evaluate the mental health of polytechnic students [1]. Descriptive statistics make it possible to understand the general distribution and features of mental health indicators, while correlation analysis shows the relationships between these variables [2]. Targeted interventions can be informed by this combined approach, which is useful in understanding the complex nature of mental health concerns among polytechnic students. Institutions can prioritize areas for improvement, including lowering academic stress or offering stronger support networks, by determining which factors are most strongly linked to poor mental health.

II. RELATED WORKS

In [3], a novel forecasting method based on the Min-Max Method for data labeling and Pearson's correlation coefficient for feature selection was put forth. It makes use of the Mamdani Fuzzy Inference System (FIS). By combining fuzzy logic with statistical techniques, this novel strategy seeks to solve the difficulty of forecasting students' mental health outcomes. A popular model for decision-making processes that integrates expert information in the form of language rules is the Mamdani Fuzzy Inference System (FIS).

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The input data is normalized and mapped within a specified range, usually between 0 and 1, using the Min-Max Method for data labeling. Pearson's correlation coefficient is utilized for feature selection in addition to data standardization. One technique to determine how strongly a certain attribute interacts with another is to use Pearson's correlation coefficient, which calculates the linear relationship between two variables.

Several machine learning models, such as logistic regression, naïve Bayes, K-nearest neighbor (K-NN), decision trees, support vector machines (SVM), and others, were used in [4] to forecast mental health statuses based on answers to specially created questionnaires. To find unique patterns or mental health states in the data, these studies usually begin by using unsupervised learning techniques, including clustering algorithms, to group people according to similarities in their responses. Mean Opinion Score (MOS) has been used to validate the clusters. These labels are then used to train supervised classifiers for predicting people's mental health state after the clusters have been verified. With a high accuracy of 85% and an F1 score of 0.86, in [5], Random Forest was used to predict anxiety and depression in college students, proving its usefulness in categorizing mental health conditions [5]. Their study's great discriminative capability was demonstrated by the model's Area Under the Curve (AUC) of 0.95, which showed that it could reliably distinguish between students with various mental health issues. When CNNs were employed to forecast college students' mental health outcomes, the model achieved a flawless recall score of 1.0. This implies that CNNs are very successful in spotting pupils who may be at risk for mental health problems, guaranteeing that no instance of a mental illness is missed.

Apriori and other association rule mining algorithms have been shown in studies to have the ability to uncover hidden patterns in massive amounts of mental health data. To analyze trends in student mental health, these algorithms have been effectively employed to find correlations between a variety of characteristics, including academic workload, social involvement, and sleep patterns. Significant correlations between variables including study time, social activities, and sleep were found in [6] when association rule mining was used to examine mental health data from college students. These findings were then added to risk prediction models.

III. METHODOLOGY

To provide a thorough assessment of students' mental health, the suggested methodology for evaluating polytechnic students' mental health attempts to incorporate some tools and methodologies. It offers a thorough and methodical way to comprehend the elements affecting their psychological health. The objective is to find important correlational variables, get important insights into students' mental health, and offer practical suggestions for enhancing students' well-being. The approach is divided into several stages to guarantee methodical data gathering, examination, and interpretation of students' mental health conditions.

A. Survey and Questionnaire Design

The methodology's initial stage entails creating a survey and a questionnaire specially designed to evaluate different facets of mental health. The following information will be gathered via the survey:

1) Details on the student's age, gender, academic year, branches, etc.
2) Psychological elements like stress levels.
3) Lifestyle influences include variables like social interaction, physical activity, and sleep patterns.
4) Academic-related elements such as study schedule, pressure to perform well in class, and attendance rate etc.

Likert scale items (e.g., "Strongly Agree" to "Strongly Disagree") will be included in the questionnaire to gauge students' subjective experiences and perceived stressors. With this method, students can respond in-depth to a range of mental health issues that they may encounter in both their personal and academic life.

B. Data Collection

A representative sample of polytechnic students will get the questionnaire and survey. The following actions will be taken as part of the data collection process:

1) Distributing the survey to a sizable cohort of students from several disciplines at the polytechnic.
2) Protecting participant privacy by ensuring confidentiality and ethical issues, including gaining informed permission.
3) Making sure that answers are anonymous to reduce response bias.

The gathered information will be safely kept and arranged in an analysis-ready format.

C. Data Preprocessing

Following collection, the data will go through some pre-processing steps. Data cleaning includes correcting any discrepancies in the data, eliminating irrelevant responses, and handling missing numbers. Data transformation is the process of standardizing or normalizing variables as needed to make sure they work with statistical analysis techniques. Sorting some open-ended answers into pre-established groups, like classifying stressors (personal, academic, etc.), is known as categorization.

D. Statistical Analysis Using SPSS

The statistical analysis can be carried out using the SPSS (Statistical Package for the Social Sciences) program.

1) Descriptive Statistics

The foundation for comprehending student's mental health is provided by descriptive data. Measures of central tendency, such as the mean, median, and mode, are calculated in the first phase to determine the average levels of stress, anxiety, and depression among students[7]. These metrics enable comprehension of the group's average experience with mental health issues. Measures of variability, such as variance and standard deviation, are also used to analyze the distribution and spread of responses, providing information about how consistent or inconsistent the students' experiences are.

2) Correlation Analysis

Using Pearson's correlation coefficient, correlation analysis is employed in this study to investigate the connections among various factors that affect students' mental health[8]. Finding meaningful relationships between important factors including academic burden and stress levels, sleep length and mental health, social activities and anxiety levels, and perceived support networks and general mental health is the main objective. The degree and direction of these relationships can be ascertained by computing the correlation coefficients; they can be either positive (both variables increase or decrease together), negative (one variable rises as the other falls), or non-correlated (no relationship between the variables). A perfect negative correlation is represented by a coefficient value of -1, a perfect positive correlation by a value of +1, and a weak or non-existent correlation between the variables is indicated by a number closer to 0.

For example, the association between stress levels and academic workload is important because high-stress levels may be associated with an excessive workload, which suggests that academic support or improved time management techniques are needed. Likewise, the relationship between sleep length and mental health can show how rest affects a student's mental health. The significance of encouraging appropriate sleep habits would be highlighted if a negative association was discovered, with less sleep being associated with worse mental health. Finding those variables most closely associated with students' mental health outcomes will be made possible by the correlation coefficients, which will offer a numerical way to evaluate the strength of these correlations. This data is crucial for creating evidence-based policies and plans to enhance students' mental health and well-being, especially in polytechnic institutions where particular difficulties including academic pressure and a lack of support services are common.

IV. EXPERIMENTAL RESULTS

Variable	Count	Min	Max	Mean	Std. Dev.
AGE	50	17	22	19.66	1.56
Family Income	50	15915	77742	47176.66	18155.20
Attendance Percentage	50	50.03	97.61	73.12	12.90
Academic Performance	50	6.13	9.99	8.01	1.09
Study Hours	50	1.07	4.99	3.34	1.12
Stress Level	50	1.00	3.86	1.81	0.82
Sleep Hours	50	4.16	7.93	5.79	1.19
Social Support	50	1.06	4.92	3.10	1.18
Physical Activity Hours	50	0.53	9.96	5.61	2.91
Screen Time	50	1.22	5.98	3.56	1.35
Parental Pressure	50	1.05	4.94	2.79	1.18
Peer Pressure	50	1.09	4.92	3.10	1.11
Life Satisfaction	50	1.01	4.95	2.92	1.11

Table 1: Descriptive Statistics Table

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Descriptive statistics for 50 students from a Polytechnic college in Kerala are included in the table, which summarizes factors of age, way of life, academic achievement, and general well-being. The descriptive statistics table gives an overview of 12 factors measured across a sample of 50 individuals. The participants' ages vary from 17 to 22, with a mean of 19.66 and little variation (SD = 1.56). Significant financial diversity is indicated by the family income, which ranges from 15,915 to 77,742 units, with a mean of 47,176.66 and a large standard deviation of 18,155.20. The average attendance percentage is 73.12%, with values ranging from 50.03% to 97.61%, indicating moderate stability. A mean score of 8.01 shows generally strong academic results, with scores ranging from 6.13 to 9.99. A daily average of 3.34 study hours, with a range of 1.07 to 4.99 hours, and an average of 1.81 on a scale of 1 to 3.86, which indicates low to moderate stress levels, are found. With a mean of 5.79 and a range of 4.16 to 7.93 hours, sleep habits are close to the suggested durations. Moderate levels of perceived support are indicated by social support ratings, which range from 1.06 to 4.92 with an average of 3.10. With a mean of 5.61 and substantial variability (SD = 2.91), the hours of physical activity show a wide range (0.53 to 9.96), suggesting a variety of habits. Peer and parental pressure have moderate effects, with respective averages of 2.79 and 3.10. With a mean of 2.92 and a range of 1.01 to 4.95, life satisfaction ratings show a wide range in subjective well-being.

The table of correlation analysis sheds light on the connections between different variables. It shows the sample size (N = 50 for all variables), significance levels (Sig. 2-tailed), and Spearman's correlation coefficients. Stress levels, parental pressure, screen time, life satisfaction, and other variables are shown to have both positive and negative connections in the table, with differing degrees of strength. Statistically significant relationships are highlighted by marking significant correlations at the 0.01 and 0.05 levels. One noteworthy finding is the inverse relationship (-0.520, significant at the 0.05 level) between stress levels and academic performance, which implies that higher stress levels are linked to worse academic results. In a similar vein, social support and stress levels have a moderately negative connection (-0.325), suggesting that having more social support could assist in lowering stress. Stress levels and sleep duration have a weak and negative correlation (-0.213), suggesting that getting less sleep may increase stress, however, this association is not statistically significant. Strong negative associations between parental pressure and life satisfaction (-0.294) and social support (-0.257) imply that increased parental pressure may be a factor in lower perceptions of support and contentment.

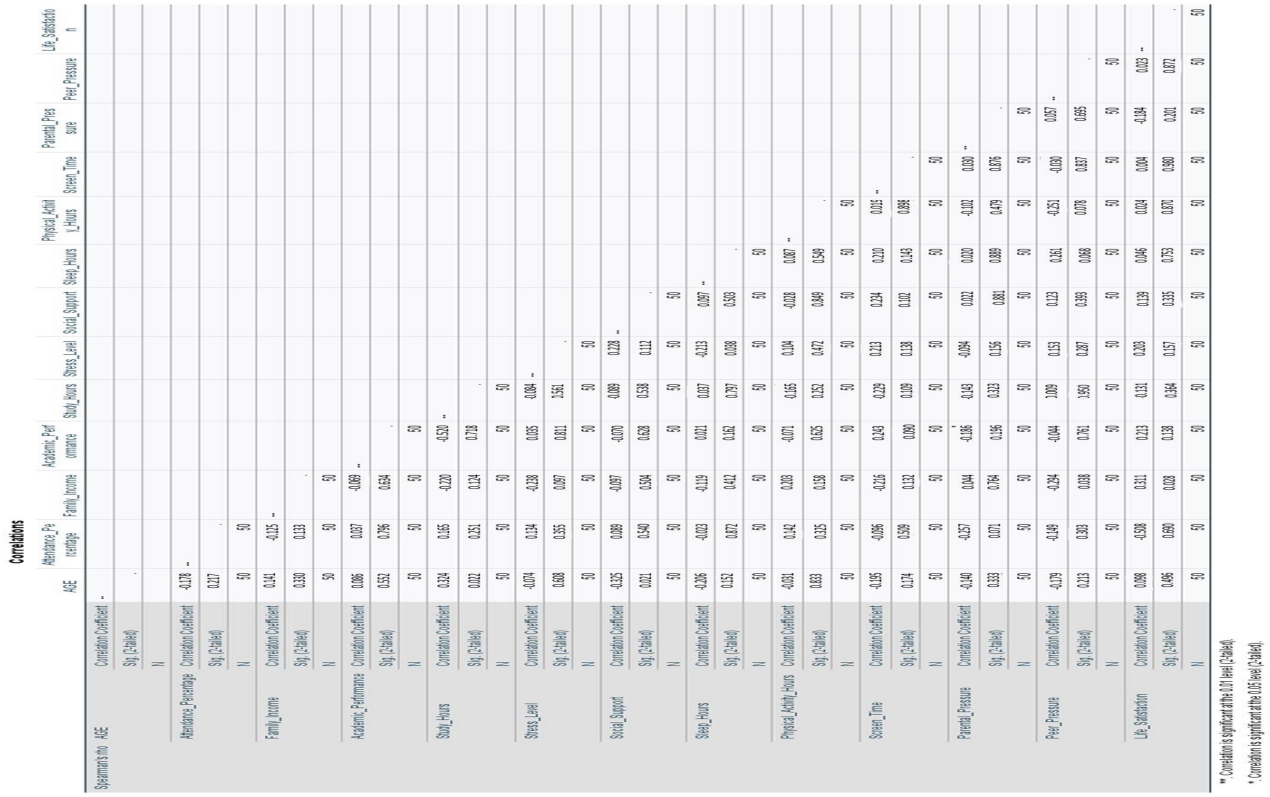


Table 2: Correlation analysis table

V. CONCLUSION

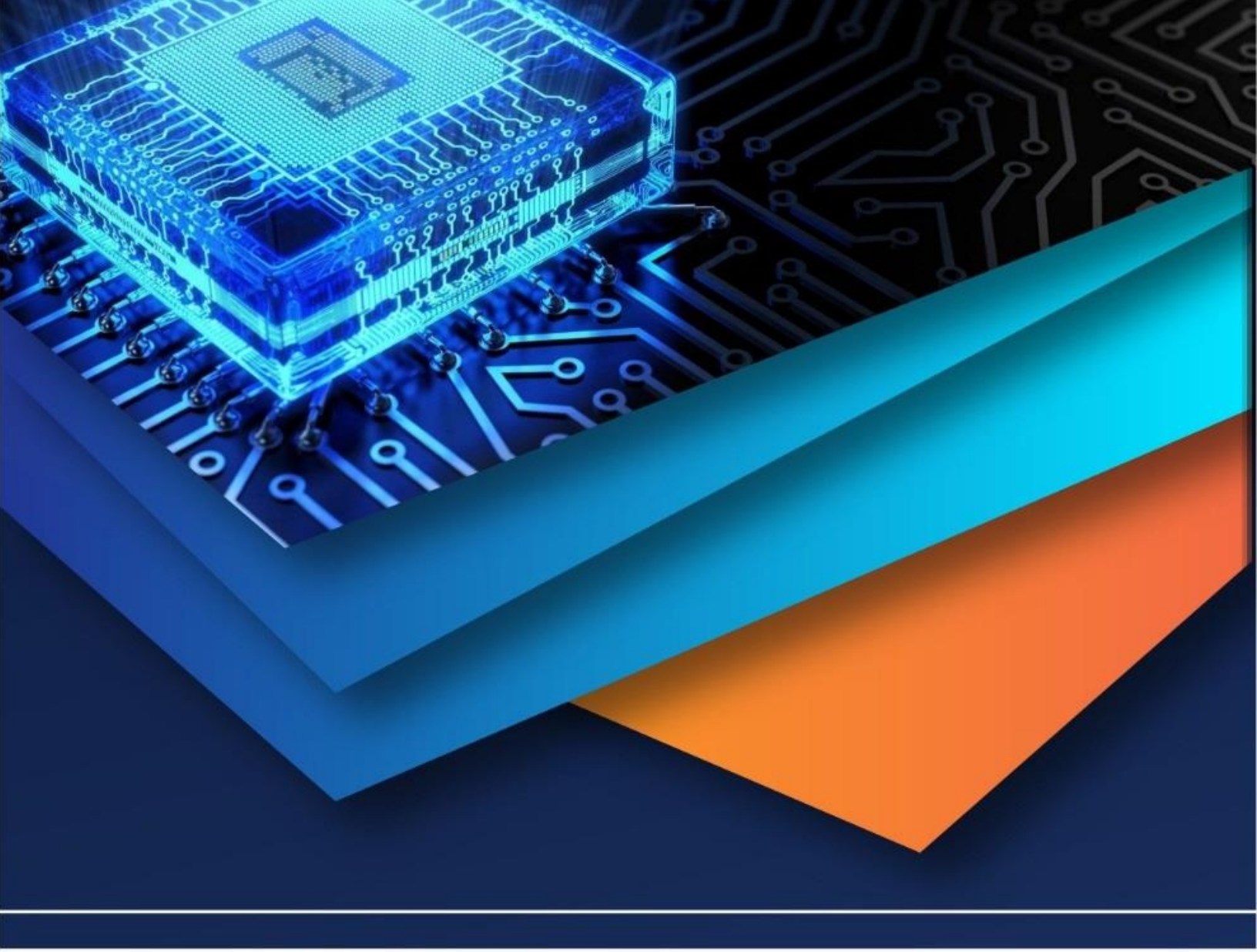
People's thoughts, feelings, and behaviours are influenced by their mental health, which is a crucial aspect of total well-being. Polytechnics typically lack the resources necessary for mental health support that traditional universities do, leaving students at risk for mental health issues in the absence of adequate intervention. With an emphasis on stress levels, the study identifies important variables affecting polytechnic students' mental health. Sleep duration, social support, and academic achievement stand out as important factors among the variables examined. A balanced academic and personal environment is crucial for mental health, as higher stress levels are linked to worse academic achievement, less social support, and less sleep. Even if there are less strong links between parental pressure and screen time, these factors may nevertheless indirectly raise stress levels and should be taken into consideration in comprehensive interventions. All things considered, the results highlight the necessity of focused tactics to enhance students' mental health, like lowering academic stress through improved workload management, creating peer support systems, and promoting sound sleeping practices. Institutions can foster an environment where students can flourish academically and emotionally by addressing these factors.

A. Conflict Of Interest

The authors have no conflicts of interest to declare.

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