Article

Research on the correlation between campus big data and the mental health status of college students with a focus on biological implications

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Abstract: This study aims to explore the potential association between multidimensional big data and the mental health status of college students, with a particular focus on biological implications. The goal is to utilize big data to achieve more accurate mental health services and timely psychological crisis interventions while addressing the shortcomings of traditional psychological assessments. We collect relevant big data from all undergraduate students at College J of a university. Through data preprocessing and quantitative transformation, students are identified as research subjects. Six representative data categories are selected, including academic achievement records, Second Classroom Report Card, access control records, leave records, daily consumption, and Internet usage hours. Pearson's correlation analysis is employed to assess the correlation between these data and psychometric scores, establishing a link to physiological and biochemical markers of mental health, such as stress-related hormones. To further validate and deepen this finding, we select the three categories of data with the highest correlation coefficients and conduct grey relational analysis (GRA) on 20 students exhibiting psychological abnormalities. The results indicate that all six categories of big data analyzed are correlated with college students' mental health, with the strongest correlation found between the Second Classroom Report Card and students' mental health status. This finding highlights the biological implications of mental health on academic performance and overall well-being. The "Second Classroom Report Card" serves as a quantitative reflection of the comprehensive qualities of college students in areas such as moral, intellectual, physical, aesthetic, and labor education. Its implementation provides a novel approach for applying big data technology and methods in evaluating the mental health levels of college students, emphasizing the physiological and biochemical factors that may influence their mental well-being.

Keywords: Pearson's correlation analysis; grey relational analysis; big data; mental health monitoring; physiological markers; academic performance; stress hormones

1. Introduction

With the continuous development of informatization, intelligence, and digital technology, the methods of education and teaching, as well as the approaches to management and service to students in Chinese universities are also evolving [1]. The advent of the big data era has also introduced both new opportunities and challenges for mental health education in colleges and universities [2,3]. All aspects of college students' learning and life on campus are constantly generating data, such as: academic achievement data, "Second Classroom Report Card" data ("Second Classroom Report Card" is a comprehensive and objective record and evaluation of the performance and achievements of college students in the second classroom. The second classroom

includes courses that serve students' growth and development, including ideological growth, innovation and entrepreneurship, art and sports, practical internships, volunteer service, work experience, and specialized knowledge and skills. "Second Classroom Report Card" can serve as an important reference for students' comprehensive quality assessment during their school years, daily awards and evaluations, promotion of outstanding candidates to join the Communist Party, evaluation of graduate student recommendation and exemption, and employment, internship, and recruitment.), library borrowing data, daily consumption data, access control system data, etc., as shown in **Figure 1**. These data not only record their academic performance, comprehensive development of moral, intellectual, physical, aesthetic and labor aspects, but also encompass multi-dimensional information such as web browsing history, social media interactions, daily behaviors and emotional expressions [4]. Some experts and scholars have found that there is a correlation between the mental health status of college students and this data by analyzing these big data [5–7]. The observation and analysis of big data can dynamically focus on changes in the mental health status of college students and identify psychological abnormalities in college students in advance [8–10]. However, at present, most of the related studies in China remain at the theoretical level, and there are few studies on which of the huge amount of data in multiple categories are more closely related to students' mental health status. This study adopts grey relational analysis to explore the extent to which various types of data are associated with mental health status. Grey relational analysis is a multifactorial statistical analysis method that is mainly used to analyze the degree of correlation between factors in a system [11]. This approach is particularly well-suited for systems with incomplete or uncertain information, such as the complex relationships between big data on students in higher education and their mental health status [12]. It is hoped that this study will help to provide new ideas and methods for mental health education research in colleges and universities, thereby facilitating more effective mental health education and intervention efforts, and to guarantee the mental health and comprehensive development of college students.
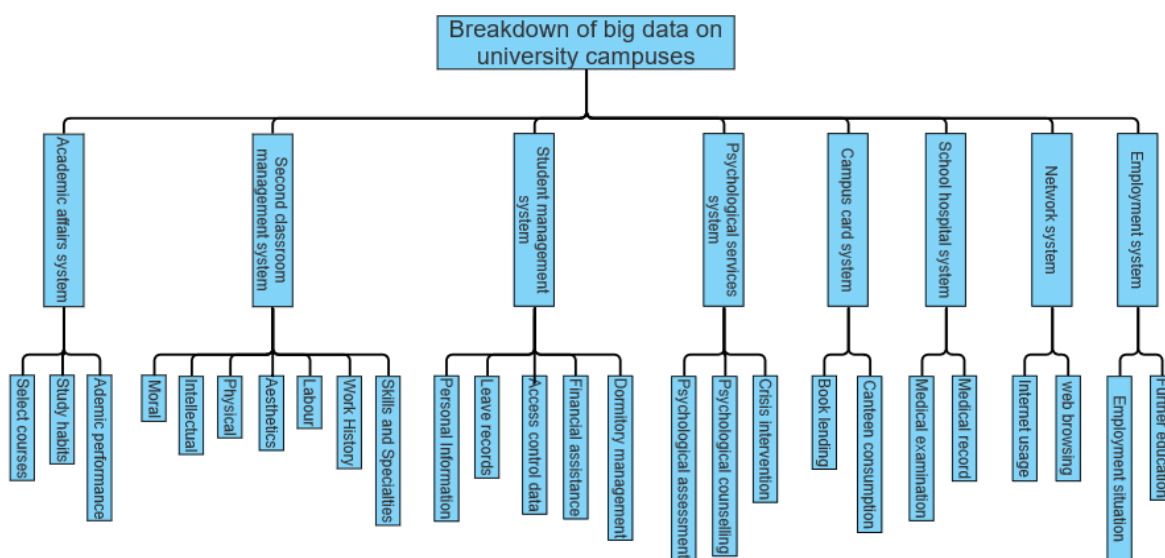

Figure 1. Breakdown of big data on university campuses.

2. Data and methods

2.1. Data source

The data used in this study came from the systematic raw data of 2485 undergraduate students in College J of a university, such as comprehensive mental health status questionnaire data, academic grades, second classroom grades, campus card consumption, access control records, and Internet usage time. The data sources are authentic, stable and reliable.

The Comprehensive Mental Health Status Questionnaire for College Students used in this paper came from the psychological assessment software developed by Beijing Xinhai Navigation Education Technology Co. The Comprehensive Mental Health Status Questionnaire for College Students consists of 113 questions, including demographic information, emotional experience, emotional self-assessment, Internet pornography use and impact, self-injurious behaviors, assessment of feelings about parental expectations, impact of appearance evaluation on self-esteem, comparative assessment of wealth and poverty, pornography-induced experiences, comparative and self-assessment of academic performance, left-behind status, sexual assault, bullying experiences, and perceptions of physical abnormalities. Except for demographic information (Equations (1)–(6)), a Likert 5-point scale was used, in which respondents chose the option that best suited their situation, based on varying degrees of their attitudes or perceptions (strongly agree, agree, neutral, disagree, strongly disagree), and assigned a value (e.g., 5, 4, 3, 2, 1) to each of the options. After students answer the questions through the psychological assessment system, the system software automatically calculates the scores and considers any score greater than or equal to 10 as abnormal. The school stipulates that students with assessment scores between 10–15 will be interviewed by a counselor, while students with assessment scores greater than or equal to 15 will be interviewed by a professional counseling teacher. Eventually, based on the results of the specific offline interviews and the scores of the online system assessment, we will comprehensively assess the psychological crisis level of the students and grade them as Level 1 (mandatory concern), Level 2 (key concern), and Level 3 (general concern) respectively. Level 1 is defined as psychological distress for more than 3 months, which seriously affects life and studies and cannot be self-regulated; Level 2 is defined as psychological distress for more than one month, which significantly affects study and life and is difficult to self-regulate; Level 3 is defined as psychological distress of less than one month, mildly affecting studies and life, and can be self-regulated.

2.2. Sample selection

The data generated from various systems of 2485 undergraduate students of College J for the academic year 2023 to 2024 were selected for this study. This includes: psychological assessment scores, academic grades (selected from the weighted average GPA of the corresponding academic year), second classroom grades (selected from the cumulative scores of the student during an academic year), campus card consumption data (calculated as the average amount of money spent on each meal during an academic year), access control records (derived from disciplinary records

such as late returns and anomalies during the corresponding academic year), and the average daily duration of Internet usage. The study also includes data on basic information such as gender, ethnicity, information on the place of origin of the students, and whether or not they are students from economically disadvantaged families. In order to ensure the accuracy of the research data, this study first carried out data cleaning by removing missing items and outliers, and normalizing the data and other data pre-processing [13]. For example, individual students who do not complete the psychological assessment as required or whose assessment time is less than 2 min are regarded as invalid data, and those who have made less than 30 purchases per month on their campus cards will be deleted. A final sample of 2000 students were selected for analysis, of which 58.4% were female and 41.6% were male; 28.7% were freshmen, 24.3% were sophomores, 25.6% were juniors, and 21.4% were seniors.

To further delve into the factors influencing of mental health of college students and to clarify the degree of correlation between campus big data and mental health, in this study carefully selected 20 students who have been diagnosed with psychological disorders from the 2000 students mentioned above as the core analysis objects. These 20 students have had multiple rounds of in-depth interviews with counselors and counseling faculty, and the types of their psychological abnormalities includes a wide range of common psychological problems among college students, ensuring the representativeness and comprehensiveness of the sample.

2.3. Statistical methods

2.3.1. Descriptive statistics and correlation analysis

Firstly, the data of psychological assessment were analyzed by descriptive statistics. Subsequently, a correlation analysis was conducted between the psychological assessment scores and six variables: academic grades, second classroom performance, access control system, number of absences, consumption data from the campus card, and hours spent surfing the internet. Based on the correlation coefficients, the three variables with the greatest correlation were selected. Finally, the degree of relation between these top three variables with the most significant impacts and the psychological assessment scores was analyzed using the grey relational analysis method. Grey relational analysis was used to attempt to validate the results of Pearson's correlation coefficient analysis using grey relational analysis. In this study, SPSS software was used to statistically analyze the data, qualitative information was expressed as the number of cases (%), data were normalized, and the test level α was set at 0.05 unless otherwise stated [14].

2.3.2. Grey relational analysis (GRA)

Grey relational analysis is one of the analytical methods of grey system theory, which is able to measure the relative strength of an indicator affected by other factors in a system where part of the information is clear and part of it is not. The method analyzes the system without knowing the distribution pattern of the influencing factors within the system, requires low sample size, and can effectively extract the main factors affecting the system. As the big data generated by college students in school often exhibits grey characteristics such as uncertainty and complexity [11], grey

relational analysis is mainly used to effectively reflect the relationship between the big data generated by college students in school and the factors affecting their mental health. In this study, the grey relational degree was calculated between academic grades, second classroom grades, disciplinary data from the access control system, and psychometric scores using grey relational analysis. Through this analysis, we aim to reveal the intrinsic links between these variables and to gain a deeper understanding of the complexity of the composition of the influencing factors. The results of this study hopefully provide an empirical basis for optimizing digital mental health education strategies and developing more effective educational tools.

Grey relational analysis method can identify the main factors affecting the target value by calculating the correlation between the reference sequence (target value) and the comparison sequence (influencing factors) and ranking them. Grey relational analysis method can be divided into three parts: data preprocessing, grey relational coefficient calculation, and relational degree calculation [15].

Data Pre-processing

Data preprocessing refers to the transformation of the original data series into the data series for analysis through mathematical transformations, also known as normalization. Assuming that the original data reference sequence is $x_0(k)$ and the comparison sequence is $x_i(k)$, $i = 1, 2, ..., m$; $k = 1, 2, ..., n$. Normalization of the original data can be divided into three different methods depending on the expectation of the data, if the expectation of the data is "the bigger the better", the normalization formula is:

$$x_i^*(k) = \frac{x_i^o(k) - \min x_i^o(k)}{\max x_i^o(k) - \min x_i^o(k)} \tag{1}$$

If the data expectation is "the smaller the better", the normalization formula is:

$$x_i^*(k) = \frac{\max x_i^o(k) - x_i^o(k)}{\max x_i^o(k) - \min x_i^o(k)} \tag{2}$$

If the data has a defined target value, the closer it converges to the target value the better, the normalization formula is:

$$x_i^*(k) = 1 - \frac{|x_i^o(k) - x^0|}{\left|\max x_i^o(k) - x^0\right|} \tag{3}$$

Alternatively, the expectation of the data can be disregarded and the original data sequence can be used directly to compare to the first value in the upper sequence:

$$x_i^*(k) = \frac{x_i^o(k)}{x_i^o(1)} \tag{4}$$

In the formula: $x_i^o(k)$ is the original sequence; $x_i^*(k)$ is the normalized sequence; $\max x_i^o(k)$ is the maximum value in the original sequence; $\min x_i^o(k)$ is the smallest value in the original sequence; x^0 is the desired target value; $x_i^o(1)$ is the first value in the original sequence.

Calculation of the Grey Relational Coefficient

After preprocessing the raw data series, the grey relational coefficient between the reference and comparison series can be calculated by the following equation.

$$\gamma\left(x_0^*(\text{k}),\ x_i^*(\text{k})\right) = \frac{\Delta_{min} - \varepsilon \cdot \Delta_{max}}{\Delta_{0i}(k) - \varepsilon \cdot \Delta_{max}}, 0 < \gamma\left(x_0^*(\text{k}),\ x_i^*(\text{k})\right) \le 1 \tag{5}$$

In the formula: $\gamma\left(x_0^*(\text{k}),\ x_i^*(\text{k})\right)$ is the comparison sequence; $x_i^*(\text{k})$ is the reference sequence; $\Delta_{0i}(\text{k}) = |x_0^*(\text{k}) - x_i^*(\text{k})|$, $\Delta_{max} = \max|x_0^*(\text{k}) - x_i^*(\text{k})|$; ε is the resolution factor, usually taken as 0.5.

Grey Relational Degree Calculation

After calculating the correlation coefficient, the grey relation degree between the comparison sequence and the reference sequence can be calculated.

$$\gamma(x_0^*,\ x_i^*) = \frac{1}{n} \sum_{k=1}^{n} \gamma\left(x_0^*(k),\ x_i^*(k)\right) \tag{6}$$

The higher the grey relational degree (GRD) values, the higher the degree of correlation between factors.

3. Results and analysis

3.1. Descriptive statistics

The university's Comprehensive Mental Health Status Questionnaire for College Students, which is used to assess students' psychological well-being, determines the classification of positive samples based on whether the average score of each option and the total symptom index (total mean score) reaches 10, serving as a criterion for screening psychological abnormalities. Specifically, if the score is lower than 10, the system indicates a normal status; if the score is equal to or higher than 10, the system indicates an abnormal status. Furthermore, the higher the score, the more serious the student's psychological problems are deemed to be. The school will pay further attention to student groups with scores of 10 and above, generally 10–15 points by counselor interviews, 15 points and above by psychological counseling teacher interviews. Based on the results of the specific interviews and the systematic assessment scores, the students' psychological crisis levels were comprehensively assessed and graded as Level 1 (mandatory concern), Level 2 (key concern), and Level 3 (general concern) respectively. In this study, the psychometric scores of 2000 students were statistically analyzed as shown in **Figure 2**. The lowest score on the measure was 3, and the highest score was 27, M = 7.461, SD = 2.606. Abnormal scores of 9.05% indicate that the overall mental health of the students in this college is good. Among them, 69.78% of the students had assessment scores of 10–15 (representing mild psychological problems), while 30.22% of the students had scores of 15 and above (representing moderate or severe psychological problems). This indicates that the majority of students (69.78%) fall into the category of mild psychological problems, while about 30.22% of the total sample of online assessment anomalies fall into the category of having more severe psychological problems. Each of the 11 subcategories in the Comprehensive Mental Health Status Questionnaire for College Students contributes to the overall mental health assessment in a unique way. Together, they reveal the mental health status of college students in terms of emotions, interpersonal relationships, self-identity, social comparison, sexual health, academic stress, social problems, and physical health, providing a comprehensive and in-depth

perspective for assessing their overall mental health. Meanwhile, the scores from the scale were analyzed, as depicted in **Table 1**. The results of the assessment revealed that academic performance, parental expectations, and the disparity between the rich and the poor were the top three factors influencing the scores. This indicated that the academic performance of college students, the level of parental expectations, and the economic conditions of their families may have a significant impact on their mental health status. Analysis shows that the pursuit of academic achievement can lead to academic stress, which in turn can lead to psychological problems. Parental expectations reflect the family's view of achievement and the level of support; a supportive family environment is conducive to reducing stress and promoting mental health, while high expectations and lack of support increase negative emotions and lead to psychological problems. Students from economically advantaged families receive more resources, opportunities and psychological support; Students who are economically disadvantaged may face additional life stresses and challenges that affect their mental health.
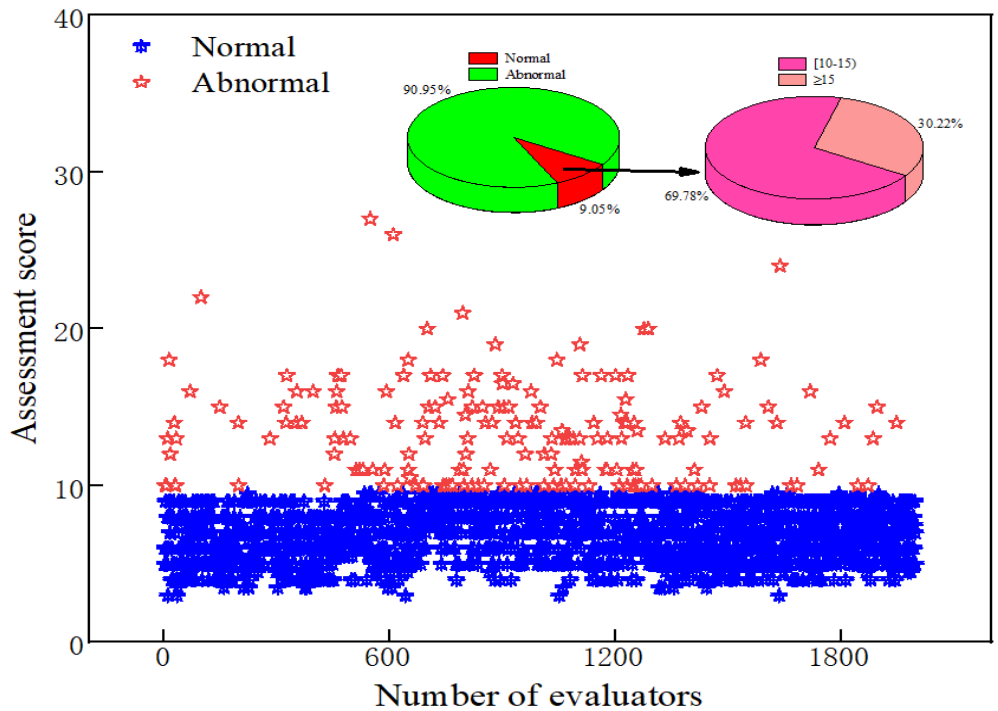

Figure 2. Distribution of students' psychometric scores in College J.

Table 1. Overall psychometric scores (*n* = 2000).

	Emotional experience	Emotional assessment	Network utilization	Self-injurious behavior	Parental expectations	Physical appearance	Comparison of rich and poor	Erotic experience	Academic performance	Leave-behind experience bullying	Trunk response	Total assessment score
M	0.91	1.18	0.55	0.73	2.45	1.09	2.09	0.64	3.09	1.73	1.82	16.27
SD	0.944	1.168	0.934	1.009	1.916	0.944	1.640	0.674	2.023	1.272	1.722	8.742

3.2. Correlation analysis

In order to extract effective influencing factors of psychological condition from college campus big data, Pearson's correlation analysis was employed to test the correlation among the six initial selection factors (academic performance, second classroom performance, access control records, number of absences, campus card consumption data, and Internet usage hours). The results indicated that all six indicators were significantly correlated with the psychometric scores, with the order of correlation strength from highest to lowest being: r (2) > r (1) > r (3) > r (4) > r (5) > r (6). Notably, three indicators-specifically, second classroom grades, academic achievement, and access control system-exhibited a stronger correlation with the psychological assessment scores compared to the remaining three indicators, suggesting a potentially stronger influence on mental health. There was a significant negative correlation between second classroom grades and academic grades and psychological assessment scores. This indicates that students with better scores in second classroom and academic performance tend to have lower psychological assessment scores, suggesting a potentially better mental health status. There was a significant positive correlation between access control data and psychological assessment scores, indicating that students with a higher frequency of disciplinary infractions such as returning late or not returning at all tend to have higher psychological assessment scores, are likely to be in poorer mental health. The data suggest that when conducting mental health education services and crisis intervention for college students, focus can be placed on information such as students' second classroom grades and academic performance, activity patterns recorded through the access control system, as these factors can be extracted from the large data sets. This will enable timely follow-up on the changes in students' psychological status (**Table 2**).

Table 2. Results of correlation analysis between psychometric scores and indicators.

factor	-	1	2	3	4	5	6
Psychometric scores	1.000	−0.639**	−0.724**	0.567**	0.567**	0.518*	0.462*
1. Academic performance	−0.639**	1.000	0.673**	−0.204	−0.246	0.153	−0.508*
2. second classroom performance	−0.724**	0.673**	1.000	−0.324	−0.317	−0.300	−0.717**
3. Access data	0.567**	−0.204	−0.324	1.000	0.511*	0.521*	0.708**
4. Number of leaves taken	0.531*	−0.246	−0.317	0.511*	1.000	0.532*	0.596**
5. Consumption data	0.518*	0.153	−0.300	0.521*	0.532*	1.000	0.459*
6. Internet usage	0.462*	−0.508*	−0.717**	0.708**	0.596**	0.459*	1.000

Note: $n = 2000$, * $p < 0.05$, ** $p < 0.01$.

3.3. Grey relational analysis results

The reference sequence in this study was the scores of the psychological tests, and the comparative sequence included 3 items: academic grades, second classroom grades, and access control data. Twenty psychologically abnormal students were used as a full sample in the grey relational analysis, and then the students were further

analyzed in subgroups based on gender and whether they were economically disadvantaged, to explore whether the results were consistent across these subgroups.

3.3.1. Full sample group

The results of the grey relational analysis for the full sample group are shown in **Table 3**, with the highest correlation of 0.785 between second classroom performance and mental health status, the second highest correlation of 0.723 for academic grades, and the third highest correlation of 0.663 for access control records; these findings are consistent with the significant correlation results obtained from the Pearson's correlation analysis.

Table 3. Results of full-sample grey relational analysis.

Serial number	Second classroom performance	Academic performance	Access data
1	0.818	0.908	0.595
2	0.816	0.811	0.676
3	0.779	0.921	0.840
4	0.786	0.427	0.581
5	0.879	0.622	0.534
6	0.834	0.684	0.682
7	0.501	0.462	0.686
8	0.700	0.677	0.889
9	0.953	0.858	0.677
10	0.774	0.669	0.502
11	0.722	0.357	0.520
12	0.824	0.799	0.472
13	0.582	0.467	0.617
14	0.915	0.913	0.670
15	0.722	0.983	0.691
16	0.740	0.623	0.680
17	0.998	0.874	0.827
18	0.740	0.728	0.676
19	0.729	0.864	0.596
20	0.884	0.809	0.870
GRD	0.785	0.723	0.663
related sequence	1	2	3

3.3.2. Male and female comparison groups

As can be seen from **Table 4**, the grey relational degrees (GRD) for the boys' group were 0.871 for second classroom performance, 0.731 for academic grades, and 0.698 for access records. The grey relational degrees in the female group were 0.752 for second classroom performance, 0.673 for academic grades, and 0.579 for access records. It can be seen that the ranking of grey relational degrees for the male-female comparison group is consistent with that of the full sample group. This indicates that gender differences do not significantly impact the strength of the relationship between

these three factors (second classroom performance, academic performance, and access control records) and mental health status.

Table 4. Results of correlation analysis between male and female subgroups, and subgroups with or without poor students.

Serial number	Second classroom performance				Academic performance				Access data			
	Male	Female	Poor students	Non-poor student	Male	Female	Poor students	Non-poor student	Male	Female	Poor Students	Non-poor student
1	0.814	0.860	0.766	0.851	0.429	1.000	0.983	0.923	0.548	0.466	0.887	0.454
2	0.814	0.717	0.798	0.705	0.796	0.714	0.429	0.584	0.339	0.589	0.581	0.525
3	0.659	0.694	0.607	1.000	0.533	0.859	0.557	0.588	0.673	0.749	0.532	0.374
4	1.000	0.679	1.000	0.876	0.891	0.340	0.736	0.672	0.766	0.508	0.536	0.514
5	0.796	0.976	0.712	0.398	0.972	0.596	0.361	0.370	0.753	0.392	0.542	0.443
6	0.715	0.879	0.541	0.658	0.447	0.665	0.464	0.457	0.943	0.581	0.713	0.429
7	0.937	0.462	0.957	0.841	0.767	0.417	0.791	0.897	0.853	0.526	0.713	0.547
8	0.830	0.697	0.633	0.597	0.815	0.665	0.345	0.892	0.812	0.693	0.712	0.580
9	0.736	0.873	0.923	0.606	0.849	0.897	0.649	0.499	0.650	0.834	0.667	0.525
10	0.866	0.682	0.648	0.955	0.807	0.575	0.741	0.904	0.640	0.452	0.476	0.910
GRD	0.817	0.752	0.759	0.749	0.731	0.673	0.606	0.679	0.698	0.579	0.636	0.530
related sequence	1	1	1	1	2	2	3	2	3	3	2	3

Note: Poor students refer to students from economically disadvantaged families; non-poor students refer to those whose families are not economically disadvantaged.

3.3.3. Family economic comparison group

The students in the sample were divided into two groups: those with and those without family economic difficulties. The process for identifying students with family economic difficulties is as follows: first, the student submits an application; then, the class establishes a Family Economic Difficulties Recognition Deliberation Panel; the panel, based on an in-depth understanding of the basic situation of the student's family and in conjunction with the student's usual consumption habits, conducts a comprehensive evaluation and then finally determines which students are students with family economic difficulties. Contrary to the self-assessment component of the Comprehensive Mental Health Status Questionnaire for College Students, which pertains to the Comparative Assessment of Wealth and Poverty, this constitutes a validation mechanism. This grouping thus combines self-assessment with external assessment, reducing bias and enhancing statistical significance. As shown by the grey relational analysis in **Table 4**, the GRD of the second classroom grades remains ranked first, regardless of whether the students belong to the economically disadvantaged group or not. However, the related sequence showed fluctuations in two indicators, academic achievement and access data. The GRD of access data for economically disadvantaged students was 0.636, which was higher than the GRD of academic performance of 0.606. The GRD between the three indicators and mental health status in the group of students from economically disadvantaged families was ranked 1st for second course grades, 2nd for access control systems, and 3rd for academic performance. The related sequence of the three indicators for non-family economically disadvantaged students remained consistent with the overall sample.

Financial constraints of families often result in poor living conditions and lack of adequate material resources and cultural and recreational facilities. Students from economically disadvantaged families may encounter multiple barriers to purchasing essential items for their studies and participating in extracurricular tutoring. Financial pressure not only reduces their learning opportunities, but may also hinder their academic progress in the long run. Students from economically disadvantaged families may have poorer academic performance as a result of uneven educational resources, not necessarily psychological problems.

4. Conclusion

4.1. Performance outcomes in the second classroom serve as one of the key data for dynamically assessing the mental health status of college students

Both Pearson's correlation and grey relational analyses found that of the large amount of data generated by students during their school years, the strongest correlation with mental health status was found to be the performance in the second classroom. Specifically, it ranked first in the grey relational analysis conducted on the full sample group, the male-female comparison group, and the family economic hardship comparison group. Therefore, to a certain extent, the grades in the second classroom can better reflect the mental health status of college students, serving as one of the important reference indicators in assessing their mental health.

For students with low participation in the second classroom, the reasons behind them can be further analyzed, such as the presence of psychological distress or disorder, so that mental health services can be targeted. The second classroom course program is divided into modules, and each module score is presented in detail in the Second Classroom Report Card, allowing for speculation about what psychological distress a student may have based on the type of participation. For example, some students only choose lectures, online quizzes and other courses that can be completed independently by individuals, but seldom choose courses that need to be completed by a group such as volunteering, cultural and sports activities, etc. This type of students may have interpersonal communication problems, and can be targeted to improve the corresponding mental health services for students. Therefore, the timeliness and relevance of mental health monitoring can be improved by focusing on the grades of college students' Second Classroom Report Card and their participation in the second classroom to analyze students' possible psychological distress. Therefore, the timeliness and relevance of mental health monitoring can be improved by focusing on college students' performance in the second class and their participation in the second class to analyze students' possible psychological distress.

The Circular on Strengthening the Management of Students' Mental Health, issued by the General Office of the Ministry of Education of China, clearly states that the important roles of physical education, aesthetic education and labor education should be given full play in order to promote the development of students' mental health in all aspects. It is also clear from the national policy that holistic development of moral, intellectual, physical, social and aesthetic skills plays an important role in

mental health. The second classroom, as an organic supplement to the first classroom, reflects the development of students during their school years in an all-round and multi-faceted manner [16]. It encompasses the five aspects of ethics, intellect, physique, aesthetics and labor, and aims to cultivate students' comprehensive qualities and abilities, such as thought-leadership, creativity, social responsibility, and teamwork. The Second Classroom Report Card is an important record and evaluation tool for the development of comprehensive qualities and abilities of college students during their school years [17]. The real-time updating feature of the second classroom report ensures that the corresponding score is immediately recorded in the second classroom management system upon completion of the activity or competition, thereby guaranteeing the high currency of the data [18]. In contrast, traditional mental health assessment methods in colleges and universities usually rely on one-time questionnaires administered at a fixed point in time [19], the results of which may be interfered with by the subjective wishes of the subjects. The accuracy of the results of the questionnaire will be difficult to guarantee if the subjects intentionally conceal their answers during the process of answering the questions. As a true reflection of students' performance in extracurricular activities during their school years, the platform data of the second classroom results are always dynamically updated [20], so it can, to a certain extent, be used as an important big data basis for the dynamic assessment of mental health status.

4.2. Respect the individuality of students, and mental health education should also be tailored to the needs of each student

The results of the analysis of the family economic comparison group show that the correlation between the data of the economically disadvantaged and non-disadvantaged students in terms of both academic achievement and access data is not the same. Furthermore, it demonstrates that each student constitutes an individual entity, possessing unique growth histories, familial backgrounds, among other factors, which subsequently lead to varied triggers for psychological issues. Therefore, we need to fully grasp the situation of students, the use of big data to personalize the analysis of students, and accurately draw a "psychological portrait" of each student. We should actively utilize modern information technologies, including big data and artificial intelligence, to facilitate the transformation of education towards digitalization and intelligence. Empowered by information technology, the optimal allocation of educational resources and the customization of personalized learning pathways ensure that educational practices are truly student-centered, embodying the educational philosophy of tailoring education to the needs of individual students, thereby fostering their holistic development and healthy growth.

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