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Retraction

Retracted: Intervention Algorithm of Horse Racing for Students' Psychological Disorders Based on Big Data

Mobile Information Systems

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This article has been retracted by Hindawi following an investigation undertaken by the publisher [1]. This investigation has uncovered evidence of one or more of the following indicators of systematic manipulation of the publication process:

(1) Discrepancies in scope
(2) Discrepancies in the description of the research reported
(3) Discrepancies between the availability of data and the research described
(4) Inappropriate citations
(5) Incoherent, meaningless and/or irrelevant content included in the article
(6) Peer-review manipulation

The presence of these indicators undermines our confidence in the integrity of the article's content and we cannot, therefore, vouch for its reliability. Please note that this notice is intended solely to alert readers that the content of this article is unreliable. We have not investigated whether authors were aware of or involved in the systematic manipulation of the publication process.

In addition, our investigation has also shown that one or more of the following human-subject reporting requirements has not been met in this article: ethical approval by an Institutional Review Board (IRB) committee or equivalent, patient/participant consent to participate, and/or agreement to publish patient/participant details (where relevant).

Wiley and Hindawi regrets that the usual quality checks did not identify these issues before publication and have since put additional measures in place to safeguard research integrity.

We wish to credit our own Research Integrity and Research Publishing teams and anonymous and named external researchers and research integrity experts for contributing to this investigation.

The corresponding author, as the representative of all authors, has been given the opportunity to register their agreement or disagreement to this retraction. We have kept a record of any response received.

References

[1] M. Qin and Q. Gui, "Intervention Algorithm of Horse Racing for Students' Psychological Disorders Based on Big Data," *Mobile Information Systems*, vol. 2022, Article ID 3513240, 17 pages, 2022.

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Research Article

Intervention Algorithm of Horse Racing for Students' Psychological Disorders Based on Big Data

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Horse racing is a competitive activity in which humans control horses. It is a worldwide traditional sports activity. In the history of human-horse racing, horse racing activities in various eras have been followed but also constantly innovated. According to the K-means clustering algorithm, a cluster analysis model is constructed for the model, and the algorithm model is applied to the students' mental health counseling work. After six iterations to get the classification and six iterations of the cluster center algorithm, it was found that the mixed psychological population accounted for 50%. Horse racing can not only effectively relieve students' psychological problems and exercise students' willpower and thinking ability, but also promote traditional sports. Through K-means clustering algorithm research, frame design, and program design, a complete psychological disorder intervention system is established, which provides scientific, objective, and reliable data guarantee for the correct implementation of decision-making strategies. Integrating cluster analysis into the process of students' mental health analysis makes it easier for decision-makers to understand and master all aspects of students' information, to analyze and customize solutions for different types of students. It provides a good foundation for providing different psychotherapeutic methods for different groups of students.

1. Introduction

In today's society, increasingly serious psychological problems have become one of the important research directions of psychology and pedagogy. Students are at the most important stage of their lives and can have high cultural knowledge and wonderful life experiences. In the face of social pressure and difficulties in life and employment, there are often psychological problems such as inferiority complex, autism, extreme, withdrawal, and depression. The establishment of horse racing courses in school sports can not only promote the physical and mental development of primary school students but also exercise and cultivate their willpower and thinking independence. Therefore, it is an inevitable trend to use data mining techniques to analyze the mental health data of college students and obtain corresponding solutions to problems.

How to improve students' mental health levels, solve students' mental health problems, and ensure that students can move toward a modern and healthy future is a problem that colleges and mental health workers are constantly exploring. In recent years, students' mental health problems have been a concern by society, and scholars at home and abroad have also continued to do in-depth research on students' mental health problems. At present, the psychological intervention model of college students has become the focus of many researches. Speeding up the development of sports horse racing can not only promote the development of traditional sports but also have a positive effect on the cultivation of students' good psychological quality.

These data have different mental health problems generated by different students, collect these stubborn mental health problems with the same background and common background among these students, and conduct a comprehensive analysis of these problems with "characteristics," which can effectively prevent the occurrence of similar students' mental health problems. In order to improve and optimize decision-making and improve the efficiency of college students' psychological counseling, it is necessary to analyze the information timely and accurately. The purpose of cluster analysis is to maximize the homogeneity of each inter-class element and the heterogeneity of the inter-class elements in big data. As a non-intervention mode technology, cluster analysis has a good application market in the field of data mining, transforming complex and hidden data into actual decision-making activities, and providing a more scientific reference. Through the test of experimental data, data mining technology can be used to analyze the mental health of students.

2. Related Work

With the development of society and economy, people's life pressure is increasing, and mental health problems have also received special attention. Klein captures the audience's attention with the trendy adage that the term "big data" is applied to situations where analysts, managers, and continuous improvement teams need large amounts of data to support decision-making. In terms of quality, it is a format for decision makers to provide high-quality data [1]. Knipe et al. investigates the prevalence of mental disorders among health science students and investigates help-seeking behavior. This results that 1/4 of the students reported moderate/severe depressive symptoms and 27% reported moderate/severe anxiety symptoms. Only 21% of students with severe depressive symptoms sought professional help. The main reason for not seeking help is fear of documentation about academic records. The study highlights the magnitude of mental health problems faced by health science students [2]. Reyes et al. aimed to improve upon a previously developed non-stigmatizing smartphone app intervention for college veterans with post-traumatic stress disorder (PTSD) based on principles of acceptance and commitment therapy. The acceptability of developing prototypes was tested for this using a mixed methods research design. The results showed that this intervention was highly acceptable. Based on the results, the intervention was revised for prospective feasibility and efficacy testing [3]. Galván-Molina and Me Jiménez-Capdeville used an electronic self-report survey to screen medical students for psychopathology and related factors. He collected 323 student surveys of first-, third-, and sixth-year medical students. The three more prevalent disorders were depression (24%), attention deficit disorder with hyperactivity disorder (28%), and anxiety disorders (13%), with a prevalence of high-level burnout syndrome at 13%. In addition, Part V students use harmful tobacco and alcohol. He concluded that 60% of medical students may suffer from one or more diseases or burnout [4]. Evidence-based risk screening procedures should accurately include students who are candidates for group therapy and exclude students who do not require therapy or other forms of intervention and support for better services. Grassetti et al. described and evaluated the sequence of steps used to screen 7th and 8th-grade students ($N = 89$) who were referred by school staff for youth group trauma and grief component therapy. Results showed that group screening helped identify mental health needs, and individual interviews further identified students with PTS and emotional problems. Behavioral problems and trauma exposure predicted attrition among students eligible for treatment. MG progressively predicted students moving from group screening to individual interviews, while trauma exposure progressively predicted attrition from treatment. The findings have implications for improving research and practice, including strengthening procedures for school-based referral, screening, assessment, and selection procedures [5]. Kuang et al. proposed a unified tensor model to represent unstructured, semi-structured, and structured data. He uses the tensor expansion operator to represent various types of data as sub-tensors, which are then combined into a unified tensor. He analyzed the time complexity, memory usage, and approximation accuracy of the proposed method [6]. Zhang et al. proposed a cyber-physical system for patient-centric healthcare applications and services based on cloud and big data analytics technology, called Health-CPS. The system consists of a unified standard data acquisition layer, a data management layer for distributed storage and parallel computing, and a data-oriented service layer [7]. In today's era of real-time remote sensing, big data is much more than it first appears, efficiently extracting useful information presents systems with significant computational challenges, such as analysis, aggregation, and storage, where data is collected remotely. Considering the factors, it is necessary to design a system architecture that supports both real-time and offline data processing. Therefore, Rathore et al. proposed a real-time big data analysis architecture for remote sensing satellite applications [8]. Xing et al. discussed the group work mode of smart grid operation from the perspective of management mode. This model breaks through the geographical restrictions of energy flow and data flow, enabling advanced big data analysis. For certain large zoning systems with multiple connected utilities, each site operates in group work mode and can only use its own measured/simulated data to calculate the zonal MSR [9]. These studies are instructive to a certain extent, but there are cases where the demonstration is insufficient or not accurate enough, which can be further improved.

3. Methods of Data Mining

Most schools have their own student management system, educational administration system, etc. When the system collects student data, it only achieves the data storage function, and these data are not used effectively. With the increase of time, a large amount of "garbage" data has accumulated, and there is a lot of utilization value in this data. Similarly, the mental health data of college students also need to be analyzed by data mining. Before mining and analysis, it is necessary to preprocess the data to unify the data format, so that the system can analyze the data effectively. There are many methods of data mining, such as association analysis, cluster analysis, classification, prediction and deviation analysis, and other algorithms. Association analysis, predicting other things through one thing that is related to each other, to point out the relationship hidden in the data. The relationship between cluster analysis data is described by the distance of eigenvectors between individuals. Cluster analysis is an important part of unsupervised learning methods. Classification and predictive classification is to find a conceptual description of a category, analyze a set of objects in the database, and find common attributes from the objects. Most problems are generally difficult to model, and historical data can be used for data modeling. Deviation analysis is used to review data and find data that deviates from the norm. Cluster analysis can be applied in many fields. Cluster analysis can either be used as a data mining model to analyze data, or it can be an integral part of other algorithms [10]. In the analysis of students' mental health, it is often necessary to analyze the unique psychological factors of college students, and it is necessary to have higher requirements for clustering algorithms.

According to the established data model, the machine learning method is combined with common prediction methods such as the nearest neighbor method, naive Bayes, etc., and mathematical methods are used in large-scale databases to find an effective data mining method. Generally speaking, a large number of problems that rely on people to analyze and calculate data through experience can now be handed over to computers to generate conclusions quickly and efficiently by methods such as data mining. Driven by strong commercial interests, merchants began to use data mining technology to analyze historical promotion data and predict the customers with the largest return on investment [11]. In addition, the use of data mining technology can obtain useful information and knowledge methods, so as to find potential great benefits.

3.1. Cluster Analysis Algorithm. The clustering algorithm is an important branch in Machine Learning, generally using unsupervised learning [12]. Using a cluster analysis algorithm, the data in the database can be divided into several categories. The distance between individuals in the same category is small, so the similarity of objects in the cluster is high; while the distance between individuals in different categories is large and has great differences.

The clustering model can be described as follows: divide the n data objects in the m-dimensional space R^m, and assign the vector with the smallest distance from the cluster center to the corresponding K-means cluster. In cluster analysis, b is the number of attributes of the clustered samples, n is the number of samples, and R^m is the number of classifications preset by the user. The mathematical model is as follows: Definition—for vectors I_a, I_b in m-dimensional space R^m. There are $I_a = \{I_{a1}, I_{a2}, I_{a3}, \cdots I_{\mathrm{am}}\}$, $I_b = \{I_{a1}, I_{a2}, I_{a3}, \cdots I_{\mathrm{am}}\}$, if the distance between the vectors is $d(I_a, W_e)$: For the cluster center, if it satisfies $d(I_a, W_e) = \min(d(I_a, W_b)), \quad b = 1, 2, \ldots, k\}$, then $I_a = W_c$. The basic idea of combining statistical methods and data mining algorithms is to combine some existing effective statistical methods with data mining algorithms to generate some efficient statistical methods and increase the efficiency of cluster analysis. The cluster analysis algorithm divides the data set into k classes, and the value of k can be specified by the user. In order to achieve the best results, the clustering performance index is minimized and assigned to adjacent classes according to the minimum distance. It is quantified by the following distance methods: (1) Similarity coefficient: It is represented by a number between 0 and 1. If the samples are similar, the value is close to 1, otherwise, it is close to 0. (2) Distance function: Let Ω be the set of sample points, the distance function will satisfy the following formulas: positive definiteness $D(a, b)$, symmetry $D(a, b) = D(b, a)$, triangular inequality $D(a, b) + D(b, a) \geq D(a, c)$or $D(a, b) \leq \max(D(a, c), D(c, b))$. In the clustering method, the frequently used quantification methods are as follows:

Absolute distance:

$$D(I, J) = \left\{ \sum_{a=1}^{b} \left| I_a - J_a \right| \right\}. \tag{1}$$

Euclidean distance:

$$D(I, J) = \left\{ \sum_{a=1}^{b} \left| I_a - J_a \right|^2 \right\}^{1/2}. \tag{2}$$

Chebyshev distance:

$$D(I, J) = \left\{ \sum_{a=1}^{b} \left| I_a - J_a \right|^8 \right\}^{1/8}. \tag{3}$$

3.2. Criterion Function. The criterion function [13] is obtained by summing the squared error values of each cluster in the dataset. Calculate the squared error value for each cluster in the dataset and add them up, but it is difficult to handle datasets with uneven density. Therefore, the clustering function refers to the criterion for evaluating the strategy adopted by the system with a specific function [14]. When the final result of the clustering algorithm satisfies the criterion function, the algorithm ends. The clustering algorithm is the decision criterion of the specific function evaluation system. In order to improve the accuracy of the clustering algorithm, it is necessary to select an appropriate criterion function. Commonly used criterion functions are as follows:

(1) Error sum of squares criterion function

Assuming a mixed sample set $A = \{a_1, a_2, a_3, \cdots a_n\}$, based on a certain association, the sample set is clustered into C separate subsets $a_1, a_2, a_3, \cdots, a_n$, each of which is a type and contains $n_1, n_2, n_3, \cdots, n_c$, samples respectively. The samples are separated into subsets by some association with the mixed sample sets. In order to measure the instructions of the clustering algorithm, the error sum of squares criterion function is used. The definition Formula is as follows:

$$\begin{aligned} J_k &= \sum_{b=1}^{k}\sum_{c=1}^{n}\left\|i_c^{(b)} - m_b\right\|^2, \\ m_b &= \frac{1}{n_j}\left(\sum_{b=1}^{n} i_b\right) b = 1, 2, \ldots, c. \end{aligned} \tag{4}$$

In the Formula, m_b represents the mean of the samples in the bth class, and n_b represents the number of samples in the bth class. According to the definition of the criterion function, it is not difficult to find its value k cluster centers and the samples in each cluster. The larger the value of j_k, the larger the error of the clustering, and the lower the quality of the clustering algorithm. On the contrary, if the value of j_k is smaller, the algorithm has a good clustering effect. The limitation of the error sum of squares criterion function is that it must use relatively dense samples with small differences in the number of samples [15]. When there is a large difference in the number of samples, the error sum of squares criterion function is used to discriminate the samples, which effectively separates each clustering type.

(2) Weighted average squared distance and criterion

$$\begin{aligned} Y_X &= \sum_{b=1}^{K} P_b S_b^*, \\ S^* &= \frac{2}{n_b\left(n_b - 1\right)}\sum_{i=i_a}\sum_{i=ib}\left\|x - x'\right\|^2, \end{aligned} \tag{5}$$

where AA is the average squared distance between samples between classes. In order to deal with the large gap in sample data, the weighted average squared distance and the criterion function can be used to get the correct clustering results.

(3) Inter-class distance and criteria

$$Y_j = \sum_{b=1}^{K}\left(m_b - m\right)\left(m_b - m\right). \tag{6}$$

In the Formula, m_b is the sample mean vector of type w_b, and m is the mean vector of all samples. The larger the value of the inter-class distance and the criterion function, the higher the separation and clustering quality of the clustering results.

3.3. K-Means Clustering Algorithm. The k-means algorithm, also known as k- or k-means, is a classic aggregation technique used for many tasks [16]. It is the distance of the data point to the prototype as the objective function of optimization. The algorithm performs a rotation function by finding the limit of a function, dividing the dataset into different parts such that the evaluation point J is the smallest and the resulting classes are about the same distance. Indicates the dataset grouping method as follows:

(1) Select a certain distance as the metric between samples: The search process of k-means clustering algorithm is limited to a part of all possible partition spaces [17]. If the sample similarity between each class is very low, the k-means algorithm can often achieve better results. However, if the sample similarity between classes is high, then further division of clusters may occur. Therefore, it is possible to obtain a local rather than a global minimum solution of the scoring function due to the convergence of the algorithm.

(2) Selection criterion function

The k-means clustering algorithm is affected by the selected similarity measurement method, and the commonly used similarity measurement method uses the error sum of squares criterion function to improve the clustering performance. Assuming that I contains C cluster subsets $I_1, I_2, \ldots, I_c$; the number of samples in each cluster subset is n_1, n_2, …, n_c; the mean points of each cluster subset are $m_1, m_2, \ldots, m_c$ respectively, then the Formula of the error sum of squares criterion function is:

$$E^* = \sum_{a=1}^{c}\sum_{p\in a}\left\|p - m_a\right\|^2. \tag{7}$$

①The calculation of similarity is carried out according to the average value of objects in a cluster [15]. ② Randomly assign K cluster centers ③ For each sample I_a, assign it to the nearest neighbor class according to the principle of minimum distance. ④ Move the sample mean in the cluster to the cluster center. ⑤ Repeat the second step and the third step until the center of the cluster does not change. The data object set S is shown in Table 1. As a two-dimensional sample for cluster analysis, the required number of clusters $k = 2$.

Choose $O_1(0,2)$, $O_2(0,0)$ as the initial cluster center, namely $M_1 = O_1(0,2) =, = M_2 = O_2(0,0)$ According to the distance between the remaining objects and each central cluster, they are classified as the nearest cluster, for O_3:

$$\begin{aligned} d\left(M_1, O_1\right) &= \sqrt{(0 - 1.5)^2 + (2 - 0)^2} = 2.5, \\ d\left(M_2, O_3\right) &= \sqrt{(0 - 1.5)^2 + (0 - 0)^2} = 1.5. \end{aligned} \tag{8}$$

Obviously $d(M_2, O_2) \leq d(M_1, O_3)$, so give O_3 to C_2. For O_5:

$$d\left(M_2, O_3\right) = \sqrt{(0 - 1.5)^2 + (0 - 0)} = 1.5. \tag{9}$$

Obviously $d(M_2, O_2) \leq (M_1, O_3)$, so give O_5 to C_1 to update, get new clusters $C_1 = \{O_1, O_5\}$ and

Table 1: Student-related system table.

Field name	Notes	Type	Length	Is it allowed to be empty
Id	Student ID	String	20	No
Student-name	Student name	String	20	No
Class-id	Class number	String	20	No
Birthday	Date of birth	Date		No
Sex	Gender	String	3	No
Dormitory-id	Dormitory number	String	20	No
Contact	Contact information	String	35	No
Parents-contact	Parent contact details	String	35	No
Home-address	Home address	String	100	No
Student-id	Student number	String	20	No
Evaluator-id	Assessor number	Enum	20	No
Mental-health degree	Mental health	String		No
Evaluator-detail	Assessment details	String	Auto	No
Class-adciser-id	Numbering	String	20	No
Name	Name	enum	20	No
Sex	Gender	String	3	No
Contact	Contact information	String	20	No
Sdept	Department	String	30	No

$C_2 = \{O_2, O_3, O_4\}$, calculate the squared error criterion, the single variance is:

$$E_1 = \left[(0-0)^2 + (2-2)^2\right] + \left[(0-5)^2 + (2-2)^2\right] = 25,$$
$$M_1 = O_1 = (0,2)$$
$$E_2 = 27.25$$
$$M_2 = O_2 = (0,0). \tag{10}$$

The population mean variance is: $E = E_1 + E_2 = 25 + 27.25 = 52.25$

(3) Calculate the center of the new cluster.

$$M_1 = \left(\frac{(0+5)}{2}, \frac{(2+2)}{2}\right) = (2.5, 2),$$
$$M_2 = \left(\frac{(0+1.5+5)}{3}, \frac{(0+0+0)}{3}\right) = (2.17, 0). \tag{11}$$

Repeat the steps of selecting functions and calculating new clusters to get O_1 to C_1; O_2 to C_2, O_3 to C_2, O_4 to C_2, and O_5 to C_1. Update, get new clusters $C_1 = \{O_1, O_5\}$ and $C_2 = \{O_2, O_4\}$, the center is $M_1 = (2.5, 2)$, $M_2 = (2.17, 0)$. The individual variances are,

$$E_1 = \left[(0-2.5)^2 + (2-2)^2\right] + \left[(2.5-5)^2 + (2-2)^2\right] = 12.5 E_2 = 13.15. \tag{12}$$

The overall mean error is: $E = (E_1 + E_2) = (12.5 + 13.15) = 25.65$

After the first correlation, the mean error has improved significantly. Since the cluster centers of the two exchanges have not changed, the negotiation process ends and the algorithm stops. The K-means algorithm is used to measure a certain point in the sample. When facing the clustering problem, the algorithm is more efficient to complete the task. Even in the face of large datasets, the algorithm has high scalability and high efficiency. Since its complexity is $O(nkt)$. where n is the number of all objects, the value of k is user-specified, and t is the number of iterations, usually $k\langle n$ and $t\langle n$.

The clustering results show that when the k-means clustering algorithm is used, the difference between clusters is obvious, and the clustering effect is better [18]. The main disadvantage is that the K-Means algorithm often leads to completely different results by setting different k values. Algorithms can be used to analyze the distribution of the data, such as centers, hierarchical clustering, and density, and then choose an appropriate value of k until the cluster center tends to be stable.

According to the performance analysis of the above algorithm, it can be seen that the core problem of using the K-means algorithm for clustering lies in the selection of k value. But in the process of evaluating students' mental health, there are a lot of information management systems, such as mental health evaluation system, psychological quality evaluation system, and so on. At the same time, every college has full-time counselors working on the front line of student management for a long time, which provides a valuable theoretical basis for the selection of K-worth.

4. Intervention Algorithm for Students' Psychological Disorders

Psychological disorder is the ability of an individual to actively adapt and recover from adversity and stress [19]. In the past, it was often used in psychological development research and psychiatry research of children or adolescents to explore the relationship between resilience and early childhood life events, and the potential relationship with psychopathology.

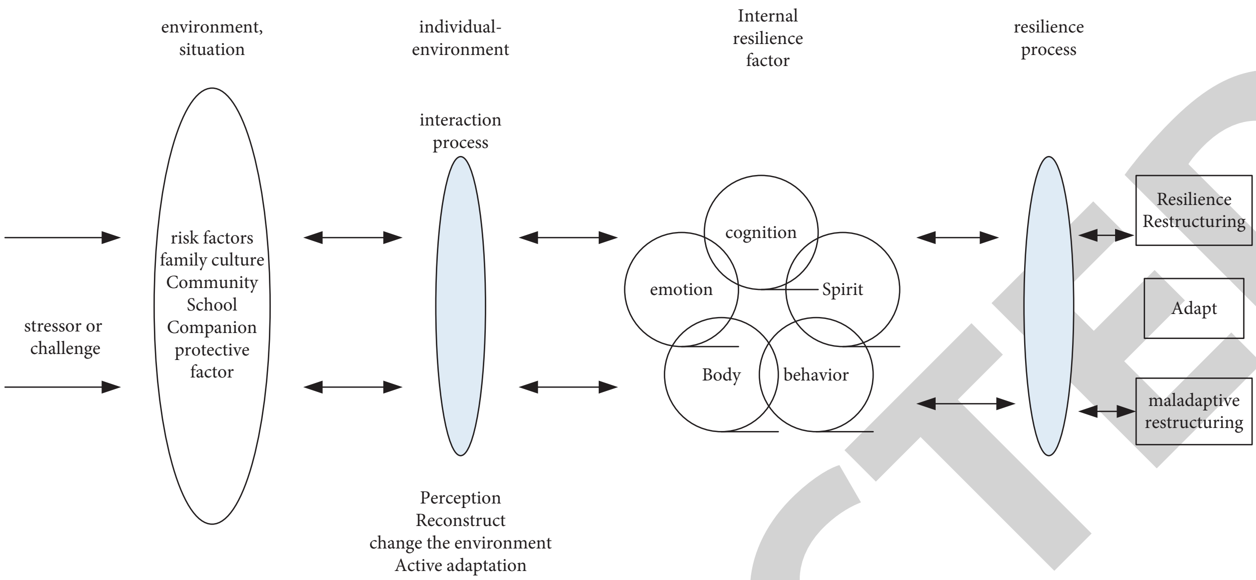


Figure 1: Psychological disorders framework.

4.1. Factors Affecting Students' Mental Health. Another important concept related to psychological disorders is protective factors, which can protect individuals from or reduce the adverse effects of risk factors. These protective factors can be divided into personal factors and external environmental factors, and individual-level protective factors such as personality, temperament, and self-efficacy. The protective factors outside the individual are mainly family and social support, such as age, parental support, etc., as shown in Figure 1.

Among them, the main factors of internal psychological barriers are mental, cognitive, behavioral, emotional, and physical [20]. Spiritual factors mainly include dreams and personal goals, meaning in life, independence, internal control, hope and optimism, determination, and perseverance. Cognitive abilities include intelligence and ability to learn and work, insight, self-esteem, planning, and creativity. People with a higher psychological barrier framework have higher levels of self-control, are able to foresee the outcome of different choices in the future, and make clear and positive plans for the future. Behavioral factors include problem-solving, empathy, and interpersonal skills. Emotional factors include well-being, emotion management skills, and a sense of humor. Physical factors include physical fitness, good performance, and strong physical fitness.

The macro definition of mental health refers to a continuous, efficient, and self-satisfied psychological state. On the other hand, at the micro level, the definition of mental health is further strengthened. It also refers to the ability of people to effectively coordinate cognition, emotion, thought, behavioral habits, and personality during a complete psychological activity process, so as to achieve the purpose of adapting to and keeping pace with society.

To determine whether students have basic mental health qualities: social adaptability, personality quality, self-control, ability to distinguish right from wrong, calmness, and so on. These are the basic criteria for judging students' mental health [21].

4.1.1. Educational Methods for Mental Health. The mental state of students can often reflect the mental state of students [22]. These factors are often very important for college students. Students acquire knowledge and grow by themselves, which is essentially a continuous psychological activity and psychological development process. In the process of receiving education, students constantly choose and absorb the knowledge provided, so that their psychology gradually moves from naive to mature, and their psychological quality is also continuously improved in this process. Colleges and universities vigorously promote mental health education to improve students' psychological quality, which is one of the effective ways to improve students' comprehensive quality.

4.1.2. The Impact of Campus Mental Health Problems. The level of students' psychological quality is related to the psychological health education environment in which they live. From the perspective of students, in the process of education, they are constantly influenced by factors such as moral norms, social environment, and family expectations and improve their own personalities. From an objective point of view, students are constantly measuring, evaluating, and regulating their own personality development in contact with different values. When certain conditions are met, a personality with personal characteristics will emerge. However, mental health education not only has this kind of passive personality transformation but also actively guides students in the transformation process. There is no big deviation in the overall direction so that students can understand themselves and further cognition of their own behavior, so as to achieve the purpose of psychological sublimation and perfect personality.

4.1.3. Stimulate Students' Potential through Mental Health. Exploiting students' potential is one of the goals of education, and students' psychological quality is strongly dependent on the development of their potential [23]. Therefore, improving mental health education has become the primary task of the coordinated development of the two. In the process of mental health education, students are guided to change their mental activities by stimulating their self-confidence and self-awareness at a higher level. Gradually strengthen the ability to adapt to complex environments, so that students' potential can be efficiently explored and brought into play. The mental health problems of contemporary college students are as follows: 1. Students are in the phenomenon of fear, depression, anxiety, and other psychological problems about the unknown. 2. The high tuition fees required to study make students bear huge financial pressure, especially those from families with poor financial ability. When learning is tied to cost, a slight deviation in grades can create extreme psychology. 3. The subjective judgment of students who are interacting with the opposite sex will be affected by emotional factors. When they are emotionally frustrated, they are prone to depression and even extremes.

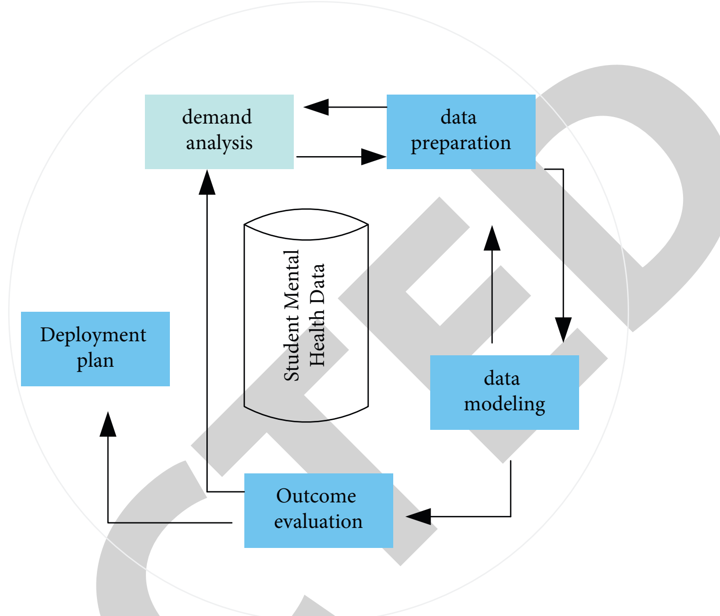


Figure 2: Data mining process.

4.2. Intervention Process Design of Horse Racing for Students' Psychological Disorders. The process of mining the psychological data of students can be divided into five parts. As shown in Figure 2, the following sections will be divided into five sections.

(1) Demand analysis: In the commercial field, data mining is used to analyze user data and customer purchase behavior, so that marketing can gain more profits, and mine operating information from data to reduce operating costs. Data mining personnel must clarify the goals of the project, provide the basis for formulating targeted strategies, and further confirm the available data mining algorithms.

(2) Data preparation: Select some data from the student psychological database for data mining [24]. If the existing student mental health data in the school meets the requirements of data mining, the data warehouse can be used as a data mining library.

(3) Data sorting: Data may be structured or unstructured data and some of them have complex data structures. To analyze data, it is necessary to preprocess the data. Comprehension is the source of data and data sets, through relevant knowledge and technology, checking and removing erroneous irrelevant data.

(4) Modeling: According to the data mining algorithm and the characteristics of the data, a prediction model is established.

(5) Interpretation and evaluation of results: Through the processing of the steps, a series of results and patterns can be obtained. The generated model results need to be verified to generate the final optimized model. If it is found that the model is not optimized enough in the steps, it is necessary to go back to the previous steps to adjust [25].

Through a detailed analysis of the existing student work process, and asking the front-line staff of the student work such as the counselor and class teacher of the Department of Information Engineering to determine the basic needs, as shown in Figure 3:

The analysis of the test results of the Student Mental Health Scale before the experiment is shown in Figure 4. $P < 0.05$ shows a significant difference, and$P < 0.01$ shows a very significant difference.

As shown in Figure 5, the functions that the student mental health management system needs to implement are as follows:

(1) It has a simple and elegant interface, supports the skinning function, and users can use the system anytime and anywhere by using the browser.

(2) Multiple user management, head teacher, psychological assessor, department-level leader, and administrator each perform their own duties and jointly manage, as shown in Figure 4.

(3) Perfect authority management, each user manages their own area without crossing the border.

(4) Management of student basic information, management of students' names, student IDs, classes, home addresses, contact information, etc., providing batch import from Excel sheets, and batch export of information to Excel sheets.

(5) Students' mental health status management, record the results of students' psychological assessment, and push the information of students with poor mental health status to their head teachers.

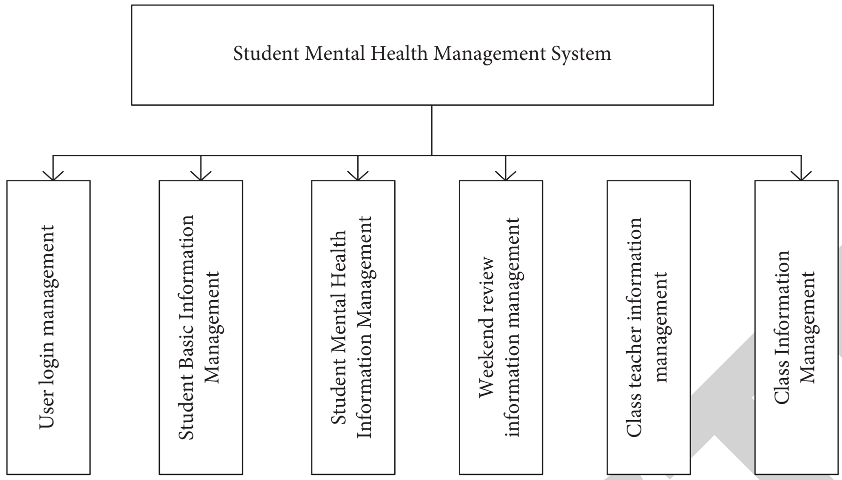


FIGURE 3: Functional structure diagram of student mental health management system.

(6) Students' weekend comment management, record the attendance and comment content of weekend comments.
(7) Class information management, to manage class information so that students can conduct centralized management by class as a unit.
(8) Information management of the head teacher, management of the contact information of the head teacher, if there are students with poor mental state, in addition to the system push information, they can also make telephone notifications.
(9) During information management, the data is displayed in pages, 50 pieces of data per page, and the current page number and the total number of records are displayed.

Use the database in the user management structure diagram to design the E-R diagram of the student mental health management system, as shown in Figure 6.

The E-R model designed according to Figure 6 can be converted into a data dictionary, and the specific design is shown in Table 1.

The physical data model is a direct representation of the database implementation. After the physical data model of the database is prepared, it can be converted into the physical realization of the database through specific DBMS products or tools such as Power Designer, and it can be thought of it as the final step in database design.

The module design of cluster analysis of students' mental health after collecting the data through the method, processing the valid data, and establishing the relevant database, the clustering algorithm data is used to analyze the data to produce the clustering result prediction analysis. The evaluation given by the analysis results is shown in Figure 7.

The students' mental health cluster analysis module test first subdivides the attributes of the relevant data in the database table in the student mental health management system. Then make an objective and rational judgment on the mental health of students through the data analysis function of the system, and thus establish a management mechanism with a practical reference value. The data preparation is divided into three steps: data selection, data pre-processing, and data transformation.

The selection phase needs to integrate the task object properties. However, attributes that are not related to the mining task and are easy to increase the complexity are eliminated, such as student number, name, etc., to reduce the load brought by the algorithm and achieve the purpose of improving the robustness of the system. Finally, the remaining attribute elements are integrated. This study summarizes various factors that affect students' psychology, extracts several factors and summarizes them, and obtains the required Table 2.

The 16PF table used in data mining is shown in Table 3.

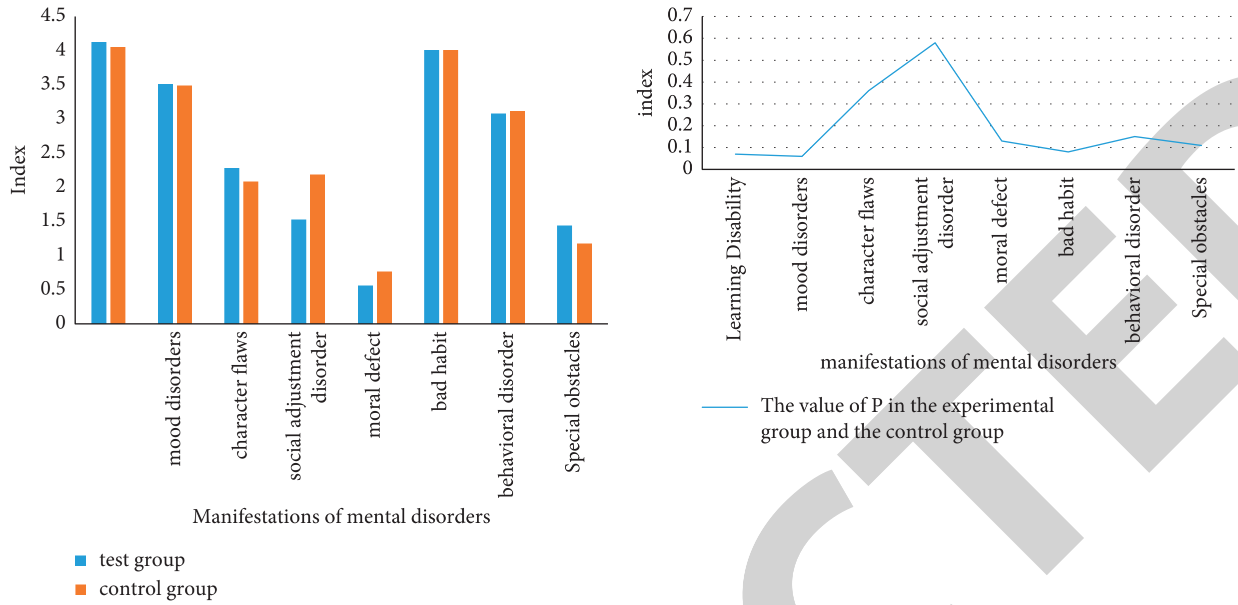
The element calculation results and brief introduction are shown in Table 4:

By pre-processing the student data such as noise reduction, filling in missing values, and deduplication, the stability of the system in the next mining and analysis is further strengthened. At the same time, it also allows the system to reduce the secondary processing time of the data in the later stage, which not only enhances the accuracy of the results but also enhances the robustness of the system.

In the database management of the mental health system, through the noise reduction processing of the effective data, the attributes of the data established in the database are merged to obtain the relevant data tables, as shown in Table 5:

After denoising the data, establish the relevant mental health table data, as shown in Figure 8:

4.3. Feasibility Analysis of K-Means Algorithm. In order to further analyze the feasibility of the clustering algorithm in the specific application process, we use the K-means algorithm to cluster the mental health data of 1000 students in a university. The results of the analysis were compared with the school's psychological evaluation system, and then the teachers of the school's mental health center evaluated the analysis results. To analyze the specific feasibility of the algorithm, we mainly use data cleaning, data transformation, data reduction, and other methods in the pre-processing



(a) (b)

FIGURE 4: Test results before and after the psychological impact of the horse racing training experimental group and the general physical education control group.

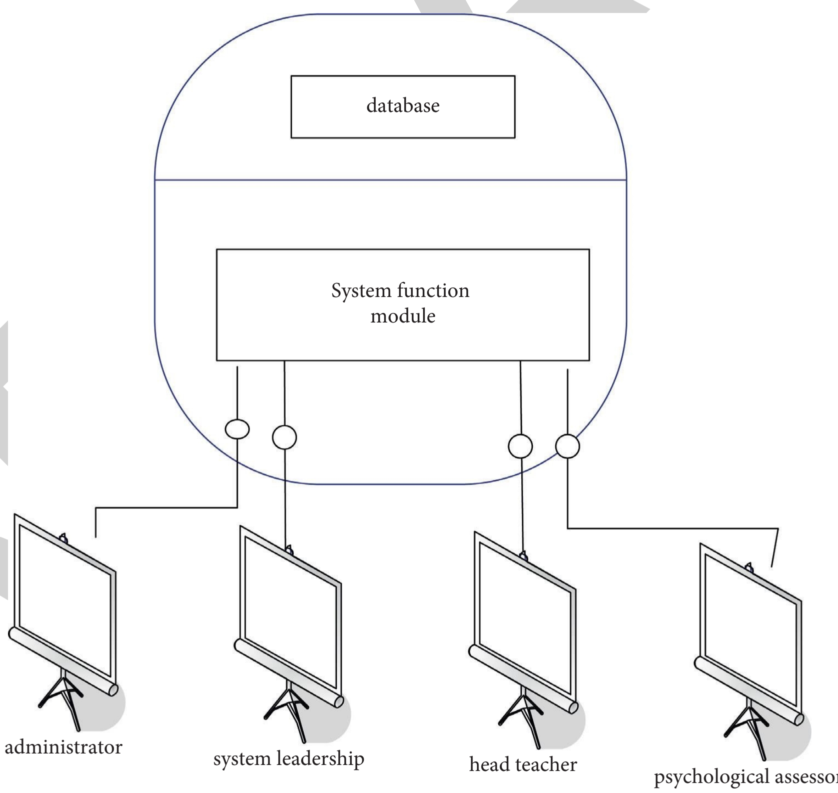


FIGURE 5: Multi-authority user management structure diagram.

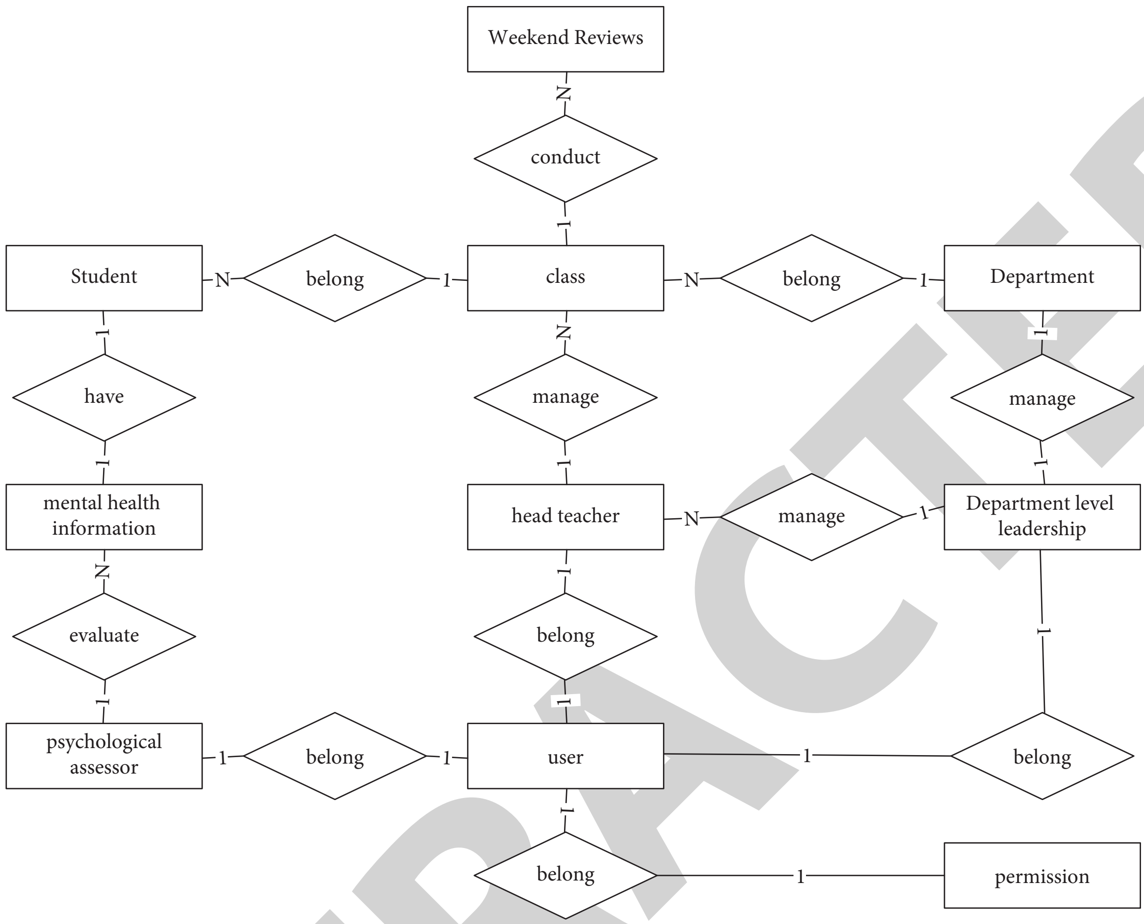


Figure 6: Entity-relationship (E-R) model.

process. The data attribute code conversion table is shown in Table 6.

Table 7 is the basic information table of a certain student. Before the system analysis, this basic information is converted into data fields that can be used by the system.

Note, according to the attribute code conversion table in the third line, the data set of the sample is {21, 31, 42, 51, 61, 72, 82}, which provides convenience for the subsequent processing of the system.

Here, a sample of 1,000 students from a university is selected. Since student management is generally managed separately by a department that is generally managed by a full-time counselor. Since the majors are similar, they have the same courses and the same management mode. Moreover, the analysis of the characteristics of student-related activities in the same department can also help counselors and colleges have a reference value in the process of managing students. Therefore, it is not only correct but also representative to select students from a department for cluster analysis.

After the pre-processing data is formed, K-means clustering is performed using SPSS software. The K-means clustering results are shown in Figure 9.

When using the K-means algorithm for cluster analysis, the number of clusters was determined by psychological consultants based on the classification of the Student SCL-90 symptom self-rating scale and the UPI college student personality test scale to determine $K = 3$. Its initial cluster center is randomly generated by the system. Among them, the seven attributes of "gender," "character characteristics," "family income," "single-parent family," "only child," "grade points" and "attendance" are used as input variables. Select 10 for the maximum number of iterations and display clustering information for each case.

4.4. Cluster Results. After six iterations, the classification results are as follows: The system performs cluster analysis, and the initial cluster center and iteration history are shown in Figure 10.

After the initial cluster center is determined, the distance between each data and the initial center is calculated and added to a new cluster. Then a new cluster center is generated. After six iterations, the cluster center remains unchanged and the algorithm ends, and the classification result is obtained. The iteration history is shown in Figure 11.

The distance table between the final cluster center map and the final cluster center is shown in Figure 12.

After six iterations, the classification is obtained, and the algorithm ends when the cluster center remains unchanged for six iterations, and the classification result is obtained. According to the previous algorithm, the distance of the final cluster center is obtained, as shown in Table 8.

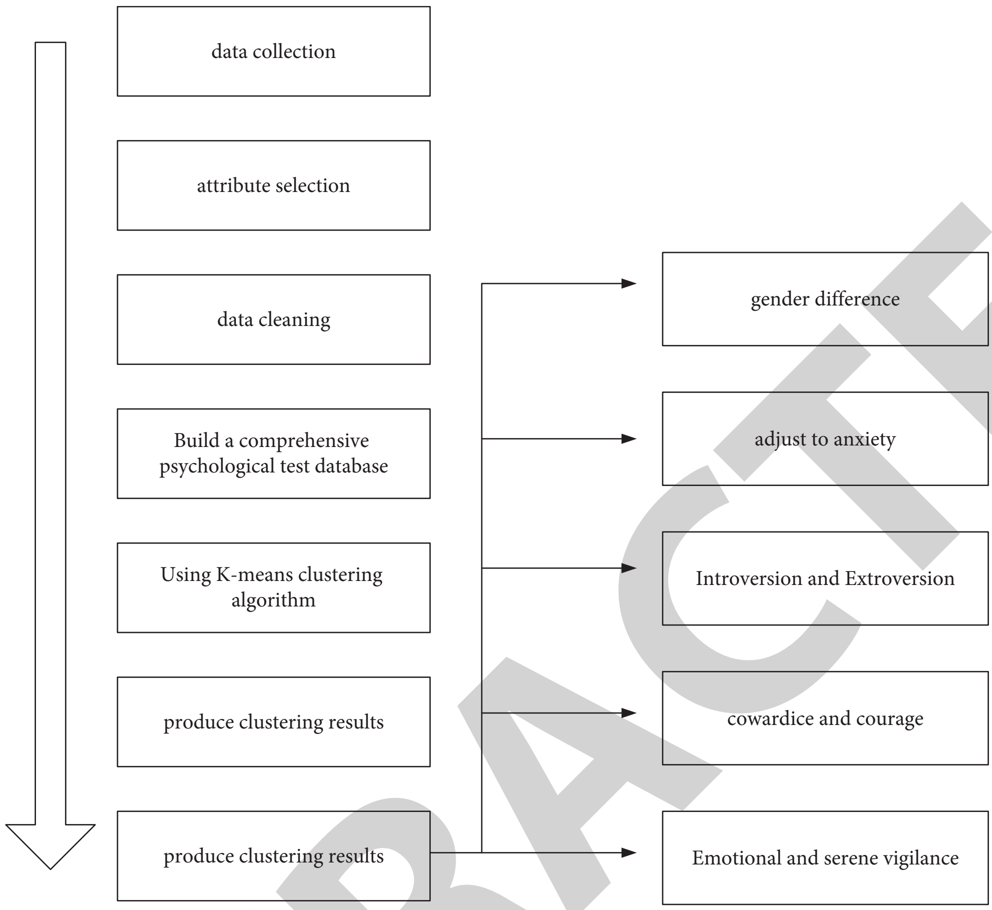


Figure 7: Flow chart of student mental health analysis.

Table 2: UPI table.

Name	Numbering	Gender	Female	Age	20
Classification number	52220111021	Test date		2019-10-11	
Evaluation score	5	Test score		93	
Physical fitness	Good	76			
Introvert/Extrovert	Extrovert	93			
interpersonal relationship	Excellent interpersonal relationship	98			
Image demeanor	Excellent	89			

Table 3: 16PF table.

Name	Number	Gender	Female	Age	20
Classification number		52220111021	Test date	2010-10-11	
Factor name	Code	Original score	Standard score		
Gregariousness	A	20	19		
Intelligence	B	20	8		
Stability	C	20	8		
Anxiety	D	20	9		
Experimental	E	20	2		
Independence	F	20	8		
Self-discipline	G	20	12		
Tension	H	20	4		

According to the results of the clustering algorithm, the comprehensive characteristics of each type of student in the student data set can be extracted.

There are 26 students in the first student category or 23% of the overall student population. The comprehensive attributes of these students show that these students are

Table 4: Elemental calculation results.

Attributes	Numbering	Initial score	Score	Notes
Adaptability and anxiety levels	X1	3.5	0	Strong adaptability to the environment
Introversion and extroversion	X2	6.5	0	Middle
Mental health	X3	6.8	0	Middle
Professional and successful	Y1	32	0	Generally
Creativity	Y2	68	5	Generally
Growth ability	Y3	21	0	Generally

Table 5: Mental health data sheet.

Field name	Type of data	is empty	Describe
Student ID	Varchar (15)	Not null	Student ID
Sex	Varchar (21)	Not null	Tester's gender
Time	Varchar (22)	Not null	Adaptation and anxiety
Introverted and outgoing	Varchar (23)	Not null	Introversion and extroversion
Calm and impetuous	Varchar (24)	Not null	Calm and impetuous
Bravery cowardice	Varchar (20)	Not null	Brave and cowardly
Mental health	Varchar (26)	Not null	Mental health
Career achievement	Varchar (27)	Not null	Career achievement
Creative ability	Varchar (28)	Not null	Creativity
Potential	Varchar (29)	Not null	Potential

introverted and stubborn in their views on issues and will not listen to others' opinions and ideas; the vast majority of families have low incomes; the majority of only children are single-parent families. The reasons lead to the fact that in all aspects, the situation of students from normal families is worse, and it is easy to cause them to have an inferiority complex. Their psychological problems are often troubled, and they are reluctant to communicate with teachers and students, making it difficult for them to detect these psychological problems early. Although students in this category study in the same environment as other students, their learning methods are not perfect due to their own reasons, and their learning efficiency is also very low. And the inefficient study makes the grades unsatisfactory, making the students have negative emotions about the grades. In the long run, the accumulation of a large number of negative emotions cannot be resolved, and this type of student is very easy to go to extremes. Even a small problem will cause this type of student to make very extreme behaviors. Therefore, this type of student is the focus of school education administrators, teachers, and psychological counselors. At the same time, according to the data in the table, it is shown that there are more male subjects in the sample, and what girls need most is a person to talk to. Therefore, among such students, more attention should be paid to girls.

There are 30 students in the second student category or 27% of the overall student population. The students in this group are mainly characterized by extroverted personalities, rich feelings, a superior family environment, and excellent academic performance. The vast majority of students hold key class positions, club positions, and college positions in the class. Therefore, this type of student needs to play an exemplary role in bringing a healthy and upward mental attitude to other students, and they are the main helpers of teachers, counselors, and psychological counselors.

There are 53 students in the third student category or 50% of the overall student population. This group of students is defined as a mixed psychological group. According to the data, this type of student has its own advantages and disadvantages, regardless of whether they are introverted or not or their ability to communicate with others. But there is a common feature that is strong self-regulation ability. Although it will be affected by the outside world, it will not change significantly, and it will slowly adjust itself over time. Although this group is relatively stable, there must be an effective management mechanism to properly intervene in their psychological state. The K-means algorithm is used in the research method of cluster analysis in the feasibility analysis of students' mental health problems. Actively analyzing the students' psychological state by extracting the data features in the students' basic information database and obtaining an accurate and stable classification. Then, through the subjective analysis of school counselors and student administrators, it is proved that the classification realized by this algorithm has a certain reference value. It can provide more and better services for the mental health management of students for the relevant staff, and also provides a new working idea and working mode for the mental health educators in colleges and universities. A set of student mental health management system is realized by using the clustering method. Through this system, more basic data of students can be obtained, and the extraction of data features can be more stable, reliable, efficient, and scalable. Finally, this data mining technology is embedded into the student management system to improve the work efficiency of relevant personnel. It makes up for the limitations of traditional analysis methods, and reflects the psychological state of students scientifically and reasonably, thereby giving more information to relevant instructors.

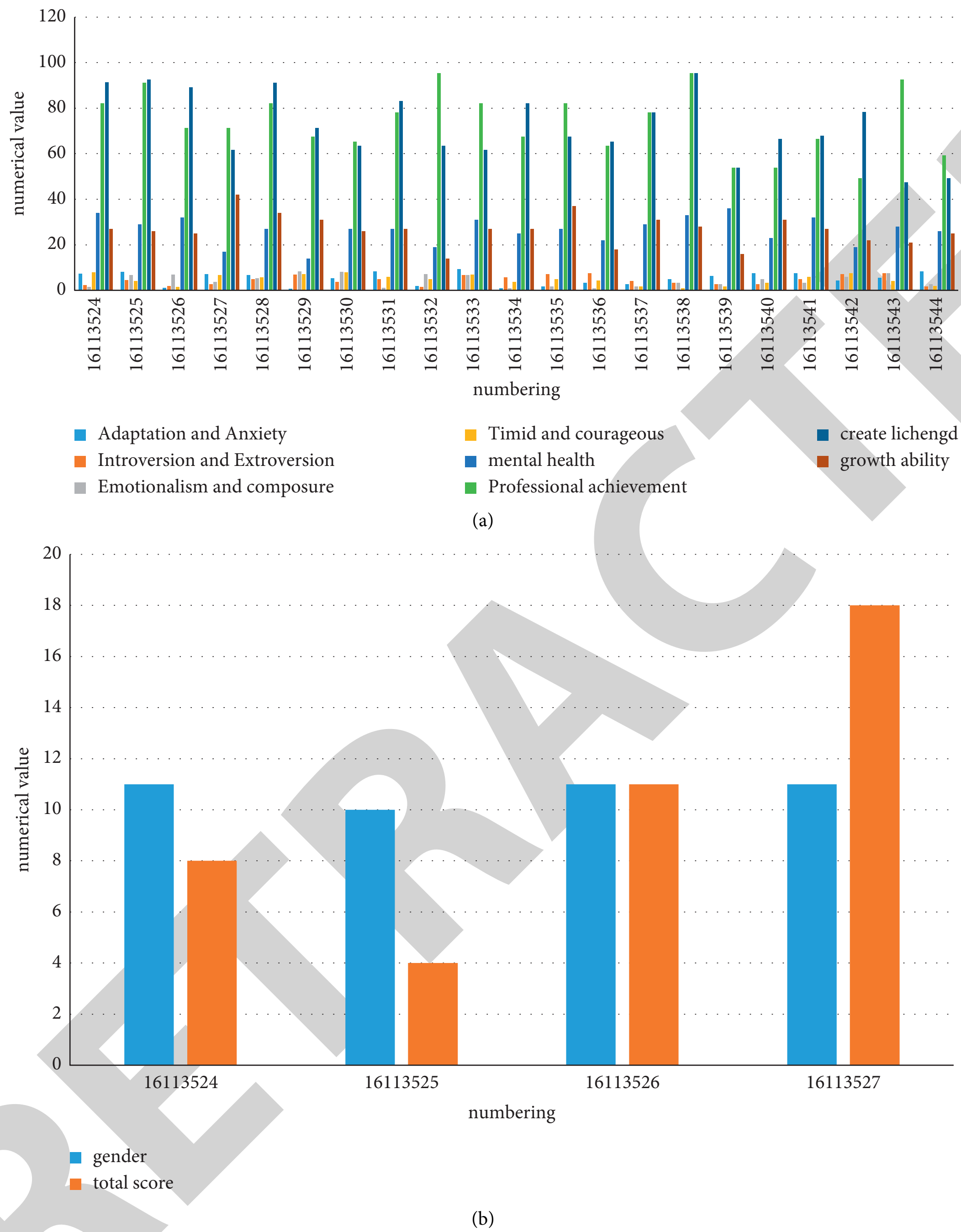


Figure 8: Selected mental health data.

5. Discussion

The development of horse racing activities in various countries and regions is not balanced and presents different styles and genres, but there is no lack of connection, exchange, and reference between each other so the various horse racing activities seek common ground while reserving differences. Using cluster analysis, the potential value information of students' psychology and the correlation between various information factors are analyzed from the massive psychological measurement data of students in the school database. It provides more scientific student mental health solutions for the majority of psychological teaching workers.

Provide theoretical and technical support for how to mine psychological data from the psychological management system. Data mining technology promotes the digitization of psychological information and effectively improves the management level and the quality of psychological services. On the one hand, the existing mental

Table 6: Data attribute code conversion table.

Data attribute	Value	Code
Gender	Male	21
	Female	22
Character traits	Introverted, intellectual	31
	Introverted, emotional	32
	Introverted, willful	33
	Extraverted, intellectual	34
	Extraverted, emotional	35
	Extraverted, willful	36
Household income	High	41
	Middle	42
	Low	43
One-parent family	Yes	51
	No	62
Is it an only child	Yes	61
	No	62
Comprehensive academic GPA	Excellent	71
	Good	72
	Qualified	73
	Failed	74
Daily attendance	Good	81
	Qualified	82
	Failed	83

Table 7: Basic information of a student.

Gender	Male	21
Character traits	Introverted intellectual	31
Household income	Middle	42
One-parent family	Yes	51
Is it an only child	Yes	61
Grade point	Good	72
Daily attendance	Qualified	82

name	gender	character	Household	one-paren	Is it an	grade poi	daily att	QCL-1
A1	22	32	43	52	62	73	83	3
A2	22	33	43	52	62	73	83	1
A3	22	33	43	52	62	74	83	3
A4	21	33	43	52	62	74	83	1
A5	22	33	43	52	62	73	83	3
A6	21	33	43	52	62	73	83	1
A7	22	32	43	52	62	74	83	3
A8	22	33	43	52	62	74	83	1
A9	22	33	43	51	62	73	83	3
A10	22	33	43	52	62	73	83	1
A11	22	33	43	52	62	74	83	3
A12	22	33	43	52	62	74	83	1
A13	22	33	43	52	62	73	83	3
A14	22	33	43	51	62	73	83	1
A15	22	33	43	51	62	74	83	3
A16	22	32	43	52	62	74	83	1
A17	22	33	43	51	62	73	83	3
A18	21	33	43	52	62	73	83	1
A19	21	33	43	51	62	74	83	3
A20	22	32	43	51	62	74	83	1
A21	22	33	43	51	62	73	82	3
A22	22	33	43	51	62	73	83	1

Figure 9: K-means clustering effect of spss software.

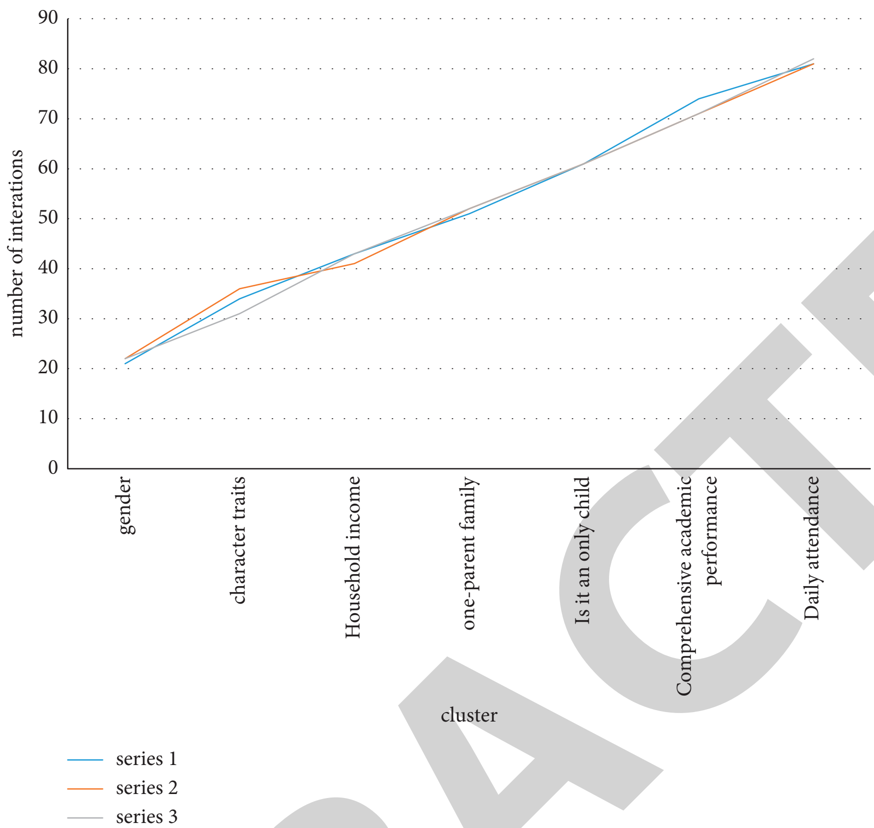


Figure 10: Initial cluster centers.

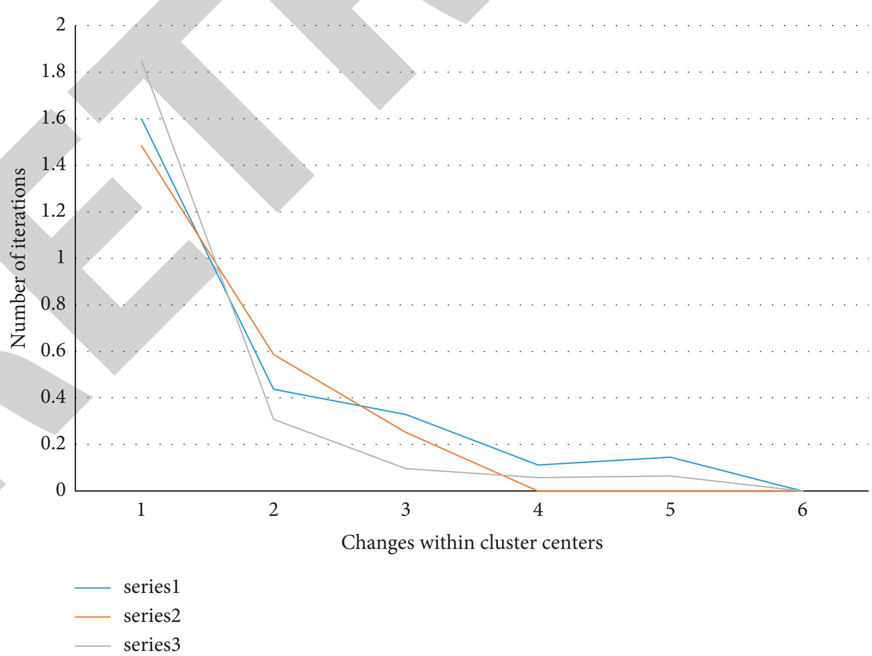


Figure 11: Iteration history.

health data of students is classified and cleaned, combined with algorithms such as cluster analysis, to make data collection more purposeful and improve analysis efficiency. On the other hand, the analysis of the psychological data in the database can further mine the relevant information on the students' psychology. In this

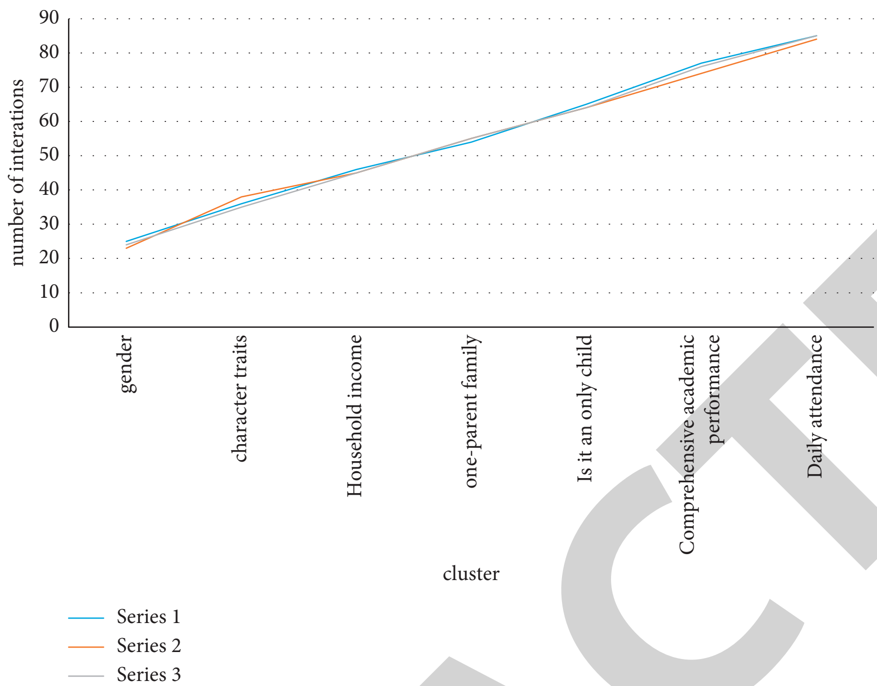


Figure 12: Final cluster centers.

Table 8: Distances between final cluster centers.

Clustering	1	2	3
1		2.835	2.070
2	2.835		3.453
3	2.070	3.453	

way, corresponding solutions can be put forward for different types of psychological problems of students, and it is convenient for schools and related personnel to quickly and conveniently understand the crux of students' psychological problems.

6. Conclusion

The government gives great support at the macro level and trains horse racing-related teachers at the meso level. Follow the example of colleges and universities to establish primary and secondary school horse racing teams, improve the mechanism of horse racing competitions and performances in primary and secondary schools, and promote the coordinated development of horse racing in universities and primary and secondary schools. It not only has an impact on the physical and mental health of primary school students but also has a profound impact on the inheritance of traditional Chinese culture. If primary school students want to have good mental health, physical exercise is the shortcut among shortcuts. The normal development of heart health and physical training are inseparable, and there is a complementary relationship between them. Horse racing not only regulate the psychological balance of students, and enhance the will quality of students, but also has a decompression function. In the psychological management system, the cluster analysis technology is used to mine psychological information, and according to the corresponding characteristics of the psychological diseases existing in the system, the associations and value information rules between different psychological assessment data are mined from the massive psychological data of students. A classification model of mental illness was constructed. And it uses mining technology to verify the application data of students' psychological management systems in practice, solves the problem of finding information from massive data, and puts forward methods and improvement suggestions for the construction of original students' psychological files. The probability of solving mental illness is greatly improved, and according to the specific spatial distribution of the data, this study adopts a two-step clustering analysis algorithm and constructs a clustering analysis model at the same time. It has provided technical support for major colleges and universities across the country to carry out student mental health-related work and has significantly improved student mental health education. [19].

Data Availability

The data that support the findings of this study are available from the corresponding author upon reasonable request.

Conflicts of Interest

The authors declare that they have no conflicts of interest.

Acknowledgments

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