Research Article

Research on Psychological Problems and Countermeasures of Contemporary College Students Based on Data Analysis

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Due to absence of good and high prevalence rate of the comprehensive method of automatic assessment, the current mental health assessment is still subject to manual answer questionnaires. The main drawback of this is that the detection of mental health issues of contemporary college students through the manual answer questionnaire is not satisfactory. Mental health problems of the students cannot be properly detected, and as a result, they remain deprived of timely psychological counseling and treatment. At the same time, in order to improve the accuracy of automatic selection of mental health and the popularity of this solution, this study first presents a detailed analysis of the possible mental health problems encountered by contemporary college students. A radial basis function (radial basis function, RBF) neural network application in the automatic selection of mental health status and comparative verification. The results proved the higher accuracy and warning of the RBF nervous system in comparison to the mental health of contemporary college students. The research further investigates the dependence of the psychological problems and solutions of contemporary college students on data analysis. It can be rightly said that the study is of great importance due to its provision of new research direction and relevant countermeasures for the psychological problems of college students.

1. Introduction

Due to the progressive nature of the society, mental health study and research have gathered due significance in any society generally. However, the issue of the mental health of the students is of particular importance. With special attention, college students are the subjects of this research. Being more in the transitory phase of life than other social people, college students encounter more psychological problems than other students of various ages. Manual questionnaires assessment and screening of the mental health status before analysis are still in practice. In the modern scenario of rapid social development and increasing mental health demand, such artificial investigation results in an information gap and the doubling of the workload. An immediate technical problem that needs an urgent solution in the original situation is an automatic extraction of information from big data to provide data support for the mental health of college students.

In today's society, the development of artificial intelligence has attracted wide attention from all walks of life, which also provides a good environment for the application of artificial neural networks. Among these, the automatic selection of information and data of college students is one of the applications of artificial neural networks. Zhang and Jin [1] mentioned in this article that the commonly used college student information data selection neural network algorithm includes self-organizing maps (SOMs) neural network, back-propagation (BP) neural network, RBF neural network, multilayer perceptron (MLP), deep neural network, and others [1]. In these information data neural network algorithm selection, the self-organization mapping (SOMs) neural network has the problem of large training time scale, while the back-propagation (BP) neural network has a slow convergence speed, so it is easy to be affected by local minima, and it is difficult to select its convergence minimum value [2]. Radial basis (RBF) neural network has the advantages of the strong division ability and can map any nonlinear relationship to a high-dimensional space, to make

it close to the linear relationship. The robustness (robust) and memory ability of radial-based (RBF) neural network are stronger compared with self-organization mapping (SOMs) neural network and back-propagation (BP) neural network, and radial-based (RBF) neural network has convenient learning rules [3]. The computer is less difficult, which leads to local minima, and the accuracy of the final selection results will be improved.

At present, a database of many students' personal information provides a convenient and rapid information source for data update, and the problem of how to screen this huge amount of data information out of the standard data for research and processing is imminent. This paper takes RBF neural network as a blueprint, takes the information of college student's mental health status as an information source, and processes its data with comprehensive intelligent technology, and the purpose is to obtain more scientific and reliable data for relevant people to research and use.

2. Analysis of Several Major Mental Health Problems and Causes among College Students

This section analyzes the different causes that affect the mental level of the pupil. The major reasons that affect the mental health of students are described as follows:

(i) Personal reasons: the quality of a family's living environment has a direct impact on a child's development and success. Yang [4] once said that some family conflicts and their parents' divorce will leave a deep shadow in the children's hearts. In this case, if the communication is not in place, there will be major psychological problems, resulting lead to concentrated learning, learning unconsciously.

(ii) Learning components: weariness has now become a widespread phenomenon, with many college students adopting the motto "61 points waste." Yumeya[5] thinks many people are pushed to take tests, pass, and receive a diploma rather than studying hard from the heart [5]. The scenario of skipping class is common; sometimes, the teacher may compel them to attend class, but when they do, their focus is diverted from studying to playing mobile phones, reading novels, or listening to music, can copy, can run, remarked the teacher in hushed tones. Furthermore, Tan [6] think the university scholarship system, as well as the final knockout, has put students under a lot of pressure to learn, with vicious competition between classmates distorting the original intent of the scholarship system, with classmates competing for one-upmanship on grades, utterly without helping each other between each other atmosphere, indifference between students, and pressure that has not let up for a long time. Anxiety and stress are examples of mental health issues that might arise.

(iii) The chances of surviving: college students are subject who are more vulnerable to maladjustment issues due to various causes. The maladjustment problems include the influence of living standards, eating habits, cultural background and influence, family history, academic level, and other variables. From the south to the north of the school, this huge change in the living environment of the students and their nonadjustment and loss of their parents after the warm embrace results in exhaustion and other psychological problems of the students. The absence of correct guidance further deteriorates the situation.

(iv) Objectives: some students lose interest in their studies after college and spend the majority of their time playing and doing other activities. He was so perplexed about his future that he gave up on his original ambition.

(v) Making an effort to communicate: distinct students have different personalities, thoughts, and methods of doing things as a result of their diverse family histories. Yang [7] thinks that everyone wants to have positive relationships with others, but because of the differences in personality, some students will feel lonely and have psychological issues [7].

(vi) The atmosphere: college students are now essentially adults. It is unavoidable that they have a romantic urge, and some students may seek out their true love. However, because they are still in the early stages of psychological development, their understanding of love is still very naive, and they lack social experience, the start of a relationship is relatively easy, and the end is relatively quick, but once love is lost, there will be a mental disorder, and thus mental problems.

(vii) Factors affecting employment: as higher education becomes more popular, the number of college graduates rises, job chances decline, finding work becomes more difficult, and graduation unemployment has become a typical occurrence. Sun [8] thinks the stress of not having a job is significant. Students from low-income households are under a lot of stress because they do not have a job, which might lead to psychological issues. College students' dread of choosing a career often leads to psychological difficulties such as anxiety, anxiety, and self-abasement when faced with the difficulty of choosing between ideal and reality, specialty, and interest.

3. How the RBF Neural Networks Work?

The RBF neural network is a kind of artificial neural network and is mainly used to handle approximately related problems. The RBF neural network has three layers, the input, hidden, and output layer.

In recent years, various neural network modes have emerged, but the best effect is RBF neural network, which is a feed-forward neural network, which is easy to use, and it converges the minimum value is the best effect in all neural networks, which make the nonlinear time series prediction of RBF neural network widely praised.

RBF neural networks are usually divided into three layers: input layer, hidden layer, and output layer. The transformation from input space to hidden layer space is nonlinear, while the transformation from hidden layer space to output layer space is linear [9].

In Figure 1, the upper green input layer represents input layer size; the middle yellow part is to hide the hidden layer size; and the hidden layer maps the vector from low dimension p to high dimension h, so that the low dimension is linearly inseparable and high dimension is linearly separable. Blue input layer is the input layer size; the output is a nonlinear college student information data sample, processed by RBF mapping in the hidden layer. Wen et al. [10] believe that the RBF neural network is usually divided into three levels: input layer, hidden layer, and output layer. In this study, the node in the input layer is the information about the mental health status of college students and the information data sample. In the article of Wu et al. [11], the number of nodes in the hidden layer is not fixed, and the transformation function used by this layer is an RBF, that is, the non-negative linear function that is radially symmetric and decaying to the central point [11]. The output layer outputs a nonlinear college student information data sample processed by the RBF mapping in the hidden layer. Zhao et al. [12] mentioned in the article that the hidden layer uses a kernel function to transform the input layer and linear classifier, which is also the difference between RBF neural network and other neural networks. Its basic idea is to transform the input data in the hidden layer, using the RBF to map the nonlinear data in the low-dimensional space to the high-dimensional space, so that it is close to the linear relationship [12]. The activation function should be applied before applying the RBF neural network, which can be expressed as

$$
\begin{aligned}
&=, \\
&= 1, 2, 3, \ldots h.
\end{aligned} \tag{1}
$$

Among: Center of the RBF: the width of width (K), also known as nuclear radius (kernel radius), influence coefficient, basis function variance, is a real constant with a positive sign. The first layer in Figure 1 is the input layer, n is the neurons of the input layer ($i = 1, 2, 3, \ldots, n$) amount, and the n value is determined by the number of students input on the student information management system platform. The semantic, geometric, and topological parameter information is also included in the student's personal information, so the x value is expressed by vectors.

The second layer is the hidden layer, and h refers to the number of neurons in the hidden layer. The independent variable in the RBF neural network function is the path length of the hidden node input mode to the central vector (such as the Euclidean distance), while the activation
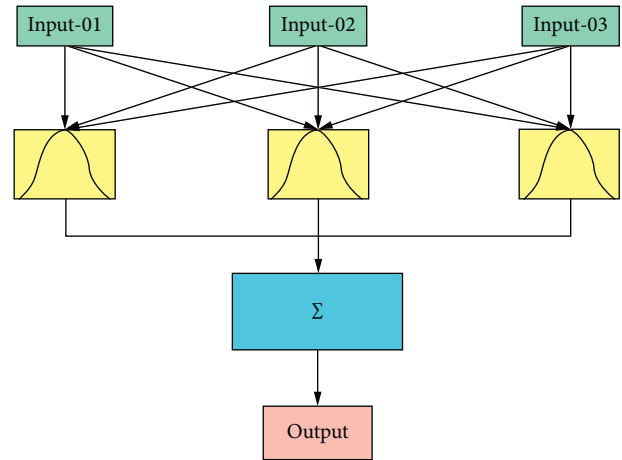

Figure 1: Functional structure diagram of the RBF neural network.

function (Gaussian function) utilizes the RBF. The longer the distance of the input diameter of the neuron is from the center of the base function, the lower the degree of neuron activation. The implicit function is a nonlinear kernel function, the shape is radial symmetry, and the larger the radius, the more the function value is closer to 0.

Hierarchical differentiation of RBF neural networks has different functions for performing different tasks, and therefore, the implied and output layers are technically classified and stripped of their optimization processes. The more efficient RBF neural network starts by searching the base function center of one of the hidden function parameters and then calculates the weight between the output layer according to the least-squares linear optimization strategy.

The experimental background calculation was implemented in Python language programming by reading the preprocessed trained sample CSV data. The implicit and linear functions of the output layer are calculated. The experimental data were further doubly classified, and the corresponding tag values were selected and removed for output.

4. Comparison of Psychological Status Assessment and Two Evaluation Methods of Contemporary College Students

4.1. Assessment of the Psychological Status of Contemporary College Students. Initially, the undergraduate students of 2019 of the University were selected as research objects, and the relevant psychological problems were investigated and summarized by issuing a questionnaire. Both the weighted factors for individuals and the weighted factors for the whole research object were taken as the reference group. Subsequently, the acquired information data sample of the mental health status of each research subject was combined through RBF neural network system to obtain the individual evaluation value and the overall evaluation value for the whole of the study subject. The resulting data were used as the observation group. Division was made between weighting factor and evaluation value based on sensitivity, specificity, warning, advance amount, minimum SAS warning, minimum SDS warning, and other indicators. A
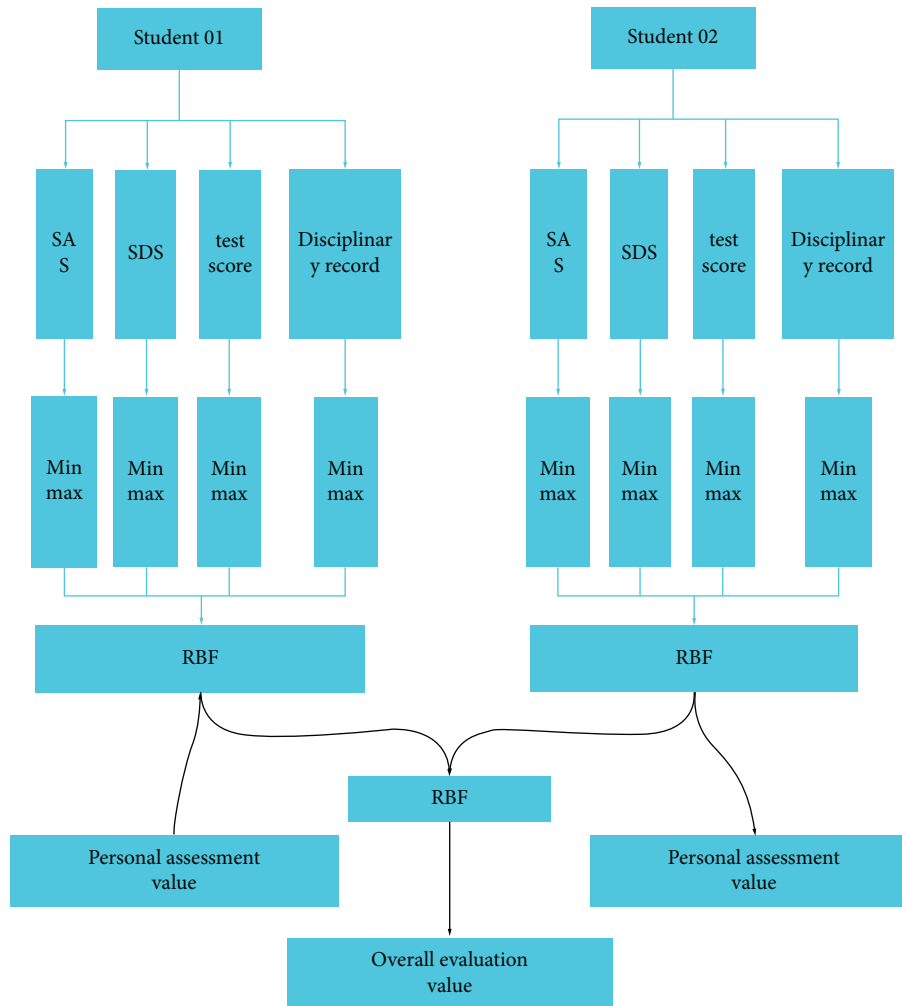
FIGURE 2: Schematic evaluation of the information data of students' mental health status by the RBF mental network system.

schematic representation of the informative data assessed on the mental health status of the college students by the RBF neural network is shown in Figure 2.

In Figure 2: SAS: A standard for anxiety assessment used to measure the severity of anxiety status and its changes during treatment; SDS: a self-evaluation scale that intuitively reflects the subjective feelings of depressed patients and their changes in treatment; test score: examination scores of contemporary college students; disciplinary record: records of discipline for contemporary college students; personal assessment value: RBF system for contemporary college students personal assessment value; overall evaluation value: after the RBF system output for the contemporary college students overall evaluation value; Minmax: enter the value obtained from the previous step into Minmax for linear reprojection, such as formula (2).

Enter the i-th entry item in the sequence x, the output item corresponding to the i th input item; enter the minimum value in the sequence x; and enter the maximum value in the sequence x.

4.2. Comparison of Evaluation Methods.
The weighted factors of the reference group and the assessed values of the

observation group were observed through the performance of the statistical analysis. The SPSS bivariate t calibration in the comparison algorithm statistical software was used to differentiate between the values of the two columns of data. As the ratio of the regression, the $R2$ values were counted to the mean residues, as described in formula (3).

Among: investigate the average value of the sample sequence calculation; the ith regression value in the sequence; the ith input value in the sequence; n examines the number of sample.

The T test which is also known as the student's t-test is the t-distribution theory for probability inference of the difference occurring. This is to compare the significance of the difference between the two averages. It is much appropriate and fit for a normal distribution with a small sample size and an unknown overall standard deviation. The t value is the outcome of the Value value of the comparison results that consider the two columns when $t < 10.000$, and the smaller the t value, the P value is from the Log value, statistical reliability when $P < 0.05$ and significant when $P < 0.01$.

The t-value and P-value of bivariate t-check come from the bivariate t-check process, where the t-value is the Value value of the output result. When $t > 10.000$, the value of the t.

000, the *P*-value is considered within the confidence space, and when $P < 0.05$, the result data have significant statistical significance. The smaller the *P*-value, the higher the confidence degree. Subject to length, only the *t* value (Value value) is explained here, such as formula (4).

Among: investigate the average value of the sample sequence calculation; mean value of the sample sequence used by reference; *n*: mean value of the sample sequence used by reference; *m*: number of nodes of the reference sample sequence; investigate the standard deviation rate of the sample sequences. By comparing the weighting factors obtained by the traditional questionnaire survey method and the sensitivity and specificity indicators in the evaluation value of the RBF neural network system, the evaluation accuracy of the two evaluation methods can be mastered. The detailed data are shown in Table 1.

In Table 1, personal sensitivity is the proportion of true positive data in positive data in personal evaluation results; individual specificity is the proportion of true negative data in negative data in personal evaluation results; collective sensitivity is the proportion of true positive data in positive data in collective evaluation results; and collective specificity is the proportion of true negative data in negative data in collective evaluation results (Figure 3).

From Table 1, the sample mental health assessment value of the RBF nervous system has a higher sensitivity and specificity than the weighting factors based on the traditional questionnaire method. In the comparative assessment results of individual sensitivity and specificity and collective sensitivity, $t < 10.000$ and $P < 0.05$ indicate that RBF and weighted factors have statistical differences and have significant sensitivity and special significance, which shows that the RBF nervous system has higher accuracy in the assessment of the mental health status of contemporary college students.

By comparing the weighting factors obtained from the traditional questionnaire survey method with the warning advance amount, minimum SAS early warning and minimum SDS early warning, the assessment and early warning degree of the two assessment methods can be mastered. The detailed data are shown in Table 2.

In Table 2, advance quantity is the time span between SAS or SDS problem; the lowest SAS warning is the system can provide the average SAS problem; and the lowest SDS warning is the system can provide the average SDS problem (Figure 4).

Table 2 shows that in comparison to the weighting factors relying on the traditional questionnaire method, the assessed mental health of the RBF nervous system has a higher warning advance amount, lower minimum SAS warning value, and lower minimum SDS warning. In the comparative evaluation results of warning advance amount, minimum SAS warning and minimum SDS warning, $t < 10.000$, $P < 0.05$. It shows that RBF and weighted factors all have significant statistical differences in warning advance amount, minimum SAS warning, and minimum SDS warning. It can be seen that the RBF nervous system has a higher warning degree for the assessment of the mental health status of contemporary college students. This is particularly obvious in the early warning and advance volume of this indicator. Now, $t = 0.000$, $P = 0.000$, time when the RBF nervous system can give a large early warning, mental health problems can be detected and warned earlier than the questionnaire method. In order to allow patients to detect problems and treat them at an earlier time, this has significant significance for the mental health of contemporary college students.

5. Research Countermeasures on the Mental Health Problems of Contemporary College Students

The following section discusses the important countermeasures which can be proven very encouraging to cope with mental issues of students.

5.1. Encourage the Students to Take a Positive Attitude. Positive attitudes and values of the students towards life are encouraged to nurture and guide pupils in correct self-understanding to accurately assess their strengths and weaknesses by enabling them to face challenges with courage, strength, and wisdom. This will precisely lead them to choose and achieve their aims of life.

5.2. Providing Mental Health Education. The following steps can be taken to provide mental health education:

(i) General catharsis: when there is a problem, rational analysis permits the individuals to come up with a variety of self-consoling justifications. At the same time, they are encouraged to deeply evaluate the cause of the failure by realizing not to repeat the same mistakes. It allows them for flexible thinking: do not boggle, learn to multiangle, all-round analysis, and thinking to find the heart equilibrium which in turn enriches their mental health. Find a hobby: If you're feeling down, try shifting your focus and get involved in something you like and enjoy.

(ii) Work in groups to communicate: group discussions should be allowed by the teachers in the classroom. Such mutual talk and communication allow pupils to express their minds and better understand each other. It also proves a self-assessing tool for individual students.

(iii) Planning activities: planning and involving students in a variety of school activities. Activities like knowledge competitions and community events on mental health education can be conducted in the form of cultural and sports events. This will improve the physical and mental health of the pupils via harmonious growth.

(iv) Mental health education system: should be based on "school, home, and society," trinity to improve psychological quality and avoid on-campus psychological issues. This requires the organization and guidance of parents and their involvement and efficient communication with their children. Parents can help and guide their children's mental health education by providing psychological counseling in the form of group consultation,

TABLE 1: Comparison table of evaluation sensitivity and specificity.

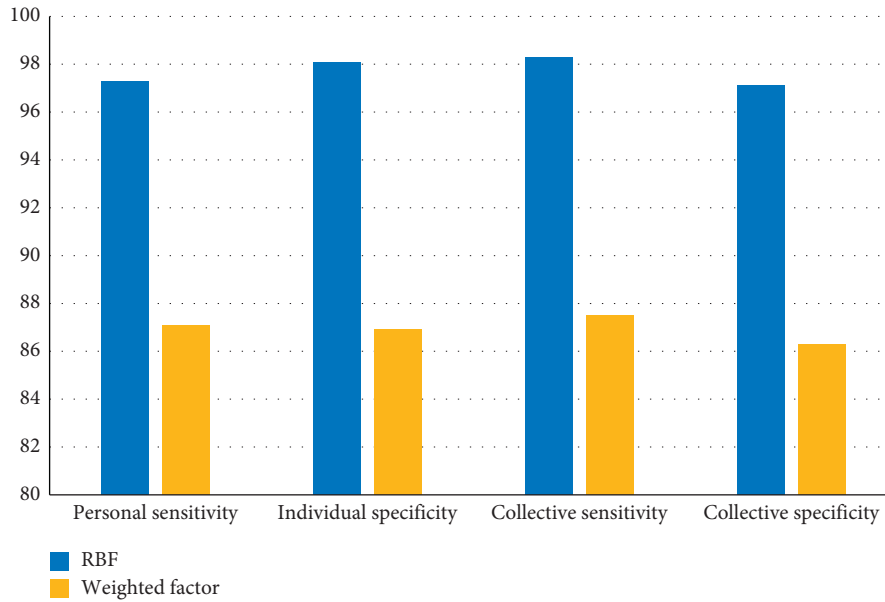| Groups	Personal sensitivity	Individual specificity	Collective sensitivity	Collective specificity
RBF	97.3	98.1	98.3	97.1
Weighted factor	87.1	86.9	87.5	86.3
T	3.287	3.267	4.135	4.558
P	0.008	0.007	0.008	0.006

FIGURE 3: Comparison table of evaluation sensitivity and specificity.

TABLE 2: Comparison of early warning evaluation efficiency.

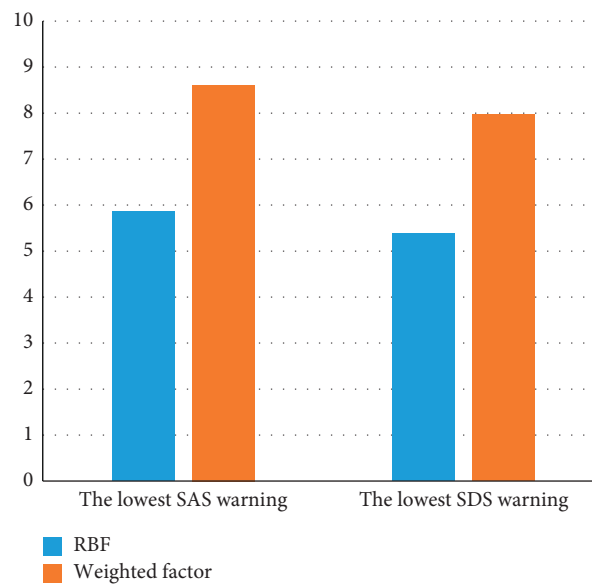| Groups	Advance quantity (d)	The lowest SAS warning	The lowest SDS warning
RBF	61.2	5.87	5.39
Weighted factor	6.9	8.61	7.97
T	0.000	1.239	2.021
P	0.000	0.005	0.004

FIGURE 4: Comparison of early warning evaluation efficiency.

network consultation, telephone letters, and other forms. Parents play a significant role in the mental health education of their children by providing weekend and holiday jobs for college students in enterprises, government agencies, and nonprofit organizations.

Finally, there must be an adequate provision of opportunities for the students. College students usually face dual pressure both academic and job choice. Proper and reasonable emotional catharsis will help them to not only avoid psychological problems but also how to cope with them.

6. Summary

This paper proposes a method of applying the RBF neural network in the automatic selection of college students' mental health status and analyzes it. We analyzed the psychological problems of contemporary college students, selected 2019 undergraduate students, used questionnaires and RBF neural network system evaluation, and analyzed the results. The results showed that RBF nervous system evaluated the mental health status and evaluated the mental health of contemporary college students.

This study offers and analyzes a method of applying the RBF neural network via the comprehensive method of automatic selection and assessment of the mental health situation of college students. Being in the transition stage, college students are more vulnerable to mental health problems. Therefore, we investigated the psychological problems of contemporary college students. For this purpose, a sample of undergraduate students of 2019 was taken. Both manual assessment questionnaires and RBF neural network system evaluation were applied to analyze the mental health situation and status of the selected students. The acquired results were compared which showed that RBF nervous system better evaluated the mental health status of contemporary college students than the manual assessment questionnaire because it has higher accuracy and warning.

Data Availability

The data from the results were obtained from the questionnaire of 2019.

Conflicts of Interest

The author declares no conflicts of interest.

Authors' Contributions

The author read the manuscript and approved it for submission.

References

[1] X. Zhang and C. Jin, "Evaluation of tunnel tunnel based on PSO-RBF neural network model," *Railway standard design*, vol. 36, no. 12, pp. 1–7, 2021.

[2] X. Luo, Z. Wang, D. Wang, and F. Guo, "Contact resistance prediction based on the ACO-RBF neural network," *Sensors and Microsystems*, vol. 40, no. 11, pp. 139–142, 2021.

[3] M. Xiao, "Study on the psychological survey of college students based on multiple correspondence analysis," *Computer Knowledge and Technology*, vol. 17, no. 2, pp. 202-203, 2021.

[4] M. Yang, "Psychological prediction algorithm for college students based on internet big data mining," *Information & Technology*, vol. 12, pp. 26–30+36, 2021.

[5] Yumeya, "Prediction model of psychological disorders driven by historical data," *Microcomputer Applications*, vol. 37, no. 12, pp. 166–169, 2021.

[6] L. Tan, "Research on the mechanism of psychological crisis prevention and rapid response of college s," *Industry and Science and Technology Forum*, vol. 21, no. 1, pp. 287-288, 2021.

[7] R. Yang, "Research on mental health education of college students from the perspective of human socialization," *Teaching in Forest areas*, vol. 12, pp. 117–120, 2021.

[8] K. Sun, "The necessity and strategy of mental health education for college students," *The Road to Becoming a Talent*, vol. 35, pp. 142–144, 2021.

[9] S.-K. Oh, W.-D. Kim, W. Pedrycz, and B.-J. Park, "Polynomial-based radial basis function neural networks (P-RBF NNs) realized with the aid of particle swarm optimization," *Fuzzy Sets and Systems*, vol. 163, no. 1, pp. 54–77, 2011.

[10] H. Wen, T. Yan, Z. Liu, and D. Chen, "Integrated neural network model with pre-RBF kernels," *Science Progress*, vol. 104, no. 3, Article ID 00368504211026111, 2021.

[11] Y. Wu, H. Wang, B. Zhang, and K. L. Du, "Using radial basis function networks for function approximation and classification," *International Scholarly Research Notices*, vol. 2012, 2012.

[12] Y. Zhao, J. Pei, and H. Chen, "Multi-layer radial basis function neural network based on multi-scale kernel learning," *Applied Soft Computing*, vol. 82, Article ID 105541, 2019.