Psychological intervention of college students with unsupervised learning neural networks

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Abstract: To better explore the application of unsupervised learning neural networks in psychological interventions for college students, this study investigates the relationships among latent psychological variables from the perspective of neural networks. Firstly, college students' psychological crisis and intervention systems are analysed, identifying several shortcomings in traditional psychological interventions, such as a lack of knowledge dissemination and imperfect management systems. Secondly, employing the Human–Computer Interaction (HCI) approach, a structural equation model is constructed for unsupervised learning neural networks. Finally, this study further confirms the effectiveness of unsupervised learning neural networks in psychological interventions for college students. The results indicate that in psychological intervention for college students. Additionally, the weightings of the indicators at the criterion level are calculated to be 0.35, 0.27, 0.19, 0.11 and 0.1. Based on the results of HCI, an emergency response system for college students' psychological crises is established, and several intervention measures are proposed.

Keywords: unsupervised learning; neural network; psychological intervention; structural equation model; human–computer interaction.

Biographical notes: Huixing Xi published two core journals (the second author), one EI journal, and one invention patent. The earlier research paper on optimisation algorithm 'Reactive Power Optimization of Distribution Network with DG Based on Hybrid PSO-ACO Algorithm' has been cited 28 times, downloaded more than 300 times, and 'A Shear based SLP vectorization Method' has been downloaded more than 100 times. Participated in the Liaoning Provincial Natural Science Foundation Guidance Program and conducted simulation research on hyperspectral image dimensionality reduction algorithm based on PCA.

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1 Introduction

College students' mental health has attracted more attention in today's society. With the improvement in education level and the increase of competitive pressure, college students face various psychological pressures and challenges (Ge et al., 2020). These problems not only hurt an individual's physical and mental health but may also affect their academic performance and future development. Higher educational attainment has a substantial influence on students' academic

achievement, long-term growth, employment prospects, economic expansion, flexibility, creativity, leadership abilities, cultural competency and attitudes toward lifelong learning. They also help people develop holistically, equipping them for success in an increasingly interconnected society. Traditional psychological intervention methods often rely on professional psychological counsellors or psychotherapists to conduct face-to-face individual or group counselling (Ren et al., 2021). Conventional and contemporary techniques are used in psychological therapies for college students, with a focus on technological integration, availability, stigma reduction, personalisation and holistic well-being. These methods offer a range of services to meet the various demands of students. However, due to limited resources and high time costs, this method cannot meet the rapid growth of the mental health needs of college students. The obstacles faced by traditional psychological intervention approaches include scarce resources, inadequate infrastructure, training needs, cost restrictions and regional constraints. Time-consuming evaluations, administrative hassles and stigma all make these problems worse. Consequently, finding a more efficient and feasible intervention method is particularly vital.

In recent years, unsupervised learning Neural Networks (NNs) have made remarkable progress in machine learning (Flesia et al., 2020). Unlike traditional supervised learning, unsupervised learning can automatically find hidden patterns and rules in unlabelled data (Herbert et al., 2021), thus providing a new method for people to deal with large-scale data. Unsupervised learning, which performs best in circumstances with little labelled data, analyses unlabelled data to find patterns, structures, and correlations. Unlike supervised learning, which depends on labelled training data, it is flexible for complicated data sets without explicit instruction. Unsupervised learning neural networks can be useful in identifying factors, detecting trends and offering tailored therapies to college students who are struggling with mental health concerns. However, user privacy, professional teamwork and ethical issues all play a part in how effective they are. Based on this potential, the possibility of introducing unsupervised learning NNs into the psychological intervention of college students is explored.

This study aims to use unsupervised learning NNs as a new intervention tool to uncover potential psychological problems and solutions by analysing large-scale psychological data. It is hoped that in this way, the nature of mental health problems in college students can be better understood and provided with individualised, effective interventions. In addition, introducing unsupervised learning NNs can help people establish a more comprehensive and accurate mental health model for college students. The complexity and diversity of college student's mental health problems can be better understood by analysing and modelling multi-dimensional and multi-angle psychological data. This will help to formulate more accurate and effective intervention strategies and improve the effectiveness of mental health intervention for college students.

Firstly, an analysis is conducted on the psychological crisis and crisis intervention system of college students, and it is found that traditional psychological intervention methods have multiple shortcomings. Secondly, the Structural Equation Model (SEM) of unsupervised learning NNs is performed. Moreover, massive amounts of psychological data and information are analysed with Computer-Assisted (CA) to automatically mine potential correlations and patterns, thus discovering students' psychological problems and causes. Finally, the effectiveness of unsupervised learning NNs in the psychological intervention of college students is further proved by employing Human-Computer Interaction (HCI) and experimental verification.

2 Literature review

In the study of psychological intervention, Musso et al. (2020) found that sudden public health events had a certain impact on the emotions, life and learning of college students. Although various universities had implemented corresponding management measures in response to national prevention and control requirements, they still had a specific impact on the learning and life of college students (Musso et al., 2020). Starting from a questionnaire survey, Wang et al. (2020) explored the relationship between the basic characteristics of anger among college students and their mental health. They understood the differences in anger and mental health between individuals troubled by anger and those not, to prepare for subsequent interventions. Then, the experimental and control groups' study designs were used to verify the intervention effectiveness of narrative therapy on individuals troubled by anger emotions. The intervention of the experimental group combined the standardisation of scientific research and the personalised characteristics of clinical psychological intervention. First, the experimental group was pre-tested, and then the initial assessment was carried out. The entire intervention plan was adjusted for individual differences based on the pre-test and initial assessment results. After the end of the experiment, the subjects were tracked and tested and the innovative moment coding system developed based on narrative therapy theory was employed to analyse the intervention process. The intervention process was analysed and discussed from quantitative and qualitative perspectives (Wang et al., 2020a). Liu et al. (2022) explored the highly negatively correlated variable of psychological perception and depression. The research results showed that as an antecedent variable, it would affect depression through self-continuity, and the

partial mediating effect of self-continuity accounted for 30.68% of the total effect. Thereby, the sand play therapy was carried out with the theme of self-continuity, and the effect of the intervention was tested by the difference in questionnaire scores before and after testing and the change of individual sandplay themes. The results revealed that individual sandplay could significantly reduce the depression level of college students (Liu et al., 2022). Symons et al. (2020) found that the psychological problems of female youth are more prominent than those of male youth. Drinking, physical exercise, family relationships, online tool support, family income, online information support and online emotional support were remarkably negatively correlated with psychological problems in young people. There were significant differences in the impact of gender, physical exercise, drinking, time spent on the internet, family relationships, household registration location and online information, tools and emotional support on the psychological problems of young people (Symons et al., 2020).

In summary, the intervention effects of traditional methods often take more work to quantify and evaluate. Owing to the lack of reliable evaluation tools and indicators, it is difficult to determine whether interventions have produced positive changes and impacts. Hence, introducing unsupervised learning NNs as a new psychological intervention method for college students has excellent potential. It is beneficial for better understanding and solving the mental health problems of college students and provides personalised and effective intervention measures.

3 Psychological intervention of college students based on unsupervised learning NNs

3.1 College students' psychological crisis and crisis intervention system

Crisis refers to the imbalance in individual emotions, cognition and other aspects caused by a sudden event encountered by the parties involved (Wang et al., 2020b; Balcombe and De Leo, 2020). Everyone's inner self is constantly striving to maintain a stable state, and all aspects of the body are in a certain degree of harmony (Choi et al., 2020). When the outside world severely stimulates an individual, the psychological balance may be destroyed, and a serious crisis may occur (Frías et al., 2020). For example, if college students are emotionally frustrated and often have difficulty finding a job, they may develop negative emotions of doubt about their appearance, abilities and other aspects (Sousa et al., 2021). Then, they begin to complain about social inequality and the unfairness of fate towards themselves. If they cannot effectively adjust their psychology as soon as possible, psychological crises may occur and have serious consequences (Zeineddine et al., 2021; Reeves et al., 2021; Atlam et al., 2022). Short-term psychological crises are common among college students and are marked by extreme anguish, decreased functioning, interruptions in cognition and an elevated risk of injury. Because of the intensity of these crises and the requirement for mental health practitioners to recognise and meet their specific needs, rapid action is required.

After intense high school life, college students face many problems, such as adapting to the new learning environment in university, adapting to different learning methods and managing relationships with classmates and friends (Alharthi, 2020). These problems tend to confuse college students and make them feel confused and helpless, which may lead to a psychological crisis if they are not adjusted in time (Agyapong et al., 2020). The psychological crisis of college students mainly includes external and internal factors, as indicated in Figure 1.

Each thing has its basic attributes. If the characteristics of things are not understood, the psychological crisis of college students cannot be detected in time, and the best opportunity for crisis intervention will be missed (Elhai, J.D. and Montag, 2020; Nooripour et al., 2021). The characteristics of college students' psychological crises are denoted in Figure 2. Transition, identity discovery, social integration, academic dedication, autonomy, relationships, crises, graduation, reflection and forging an adult identity are just a few of the developmental phases that college students go through.

Everything has its features, and psychological crisis also has its characteristics (Aggarwal et al., 2022). College students are classified according to the characteristics of psychological crisis, as presented in Figure 3.

The psychological crisis is not a disease but a life experience (Geng et al., 2020). The psychological development of college students is immature, and the ability to withstand setbacks is poor (Goldberg et al., 2021a). Owing to the different crises experienced by college students, the emergency crisis-handling methods are also different (Goldberg et al., 2021b). Generally, the possible results of college students' psychological crises are displayed in Figure 4.

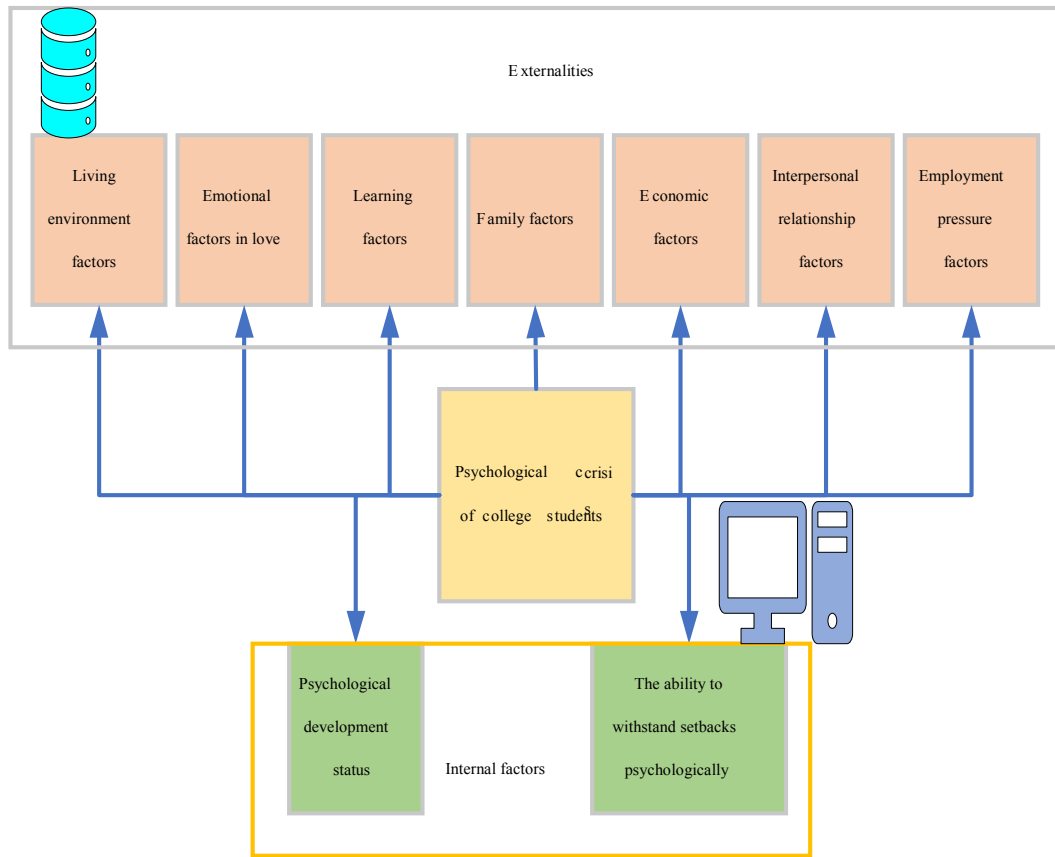**Figure 1** The factors causing psychological crises among college students (see online version for colours)

Externalities

| Living environment factors | Emotional factors in love | Learning factors | Family factors | Economic factors | Interpersonal relationship factors | Employment pressure factors |

Psychological crisis of college students

Psychological development status   Internal factors   The ability to withstand setbacks psychologically

Figure 2 The characteristics of psychological crisis among college students (see online version for colours)

Sudden and urgent

When a psychological crisis occurs, it can be severe and sudden

Painful

Individuals themselvesfeel physically uncomfortable

Helplessness

Lack of experience and not knowing how to handle it

The characteristics of psychological crisis among college students

Destructiveness

Affects other students in the school

Risk

Severe psychological crises can also endanger the lives of college students
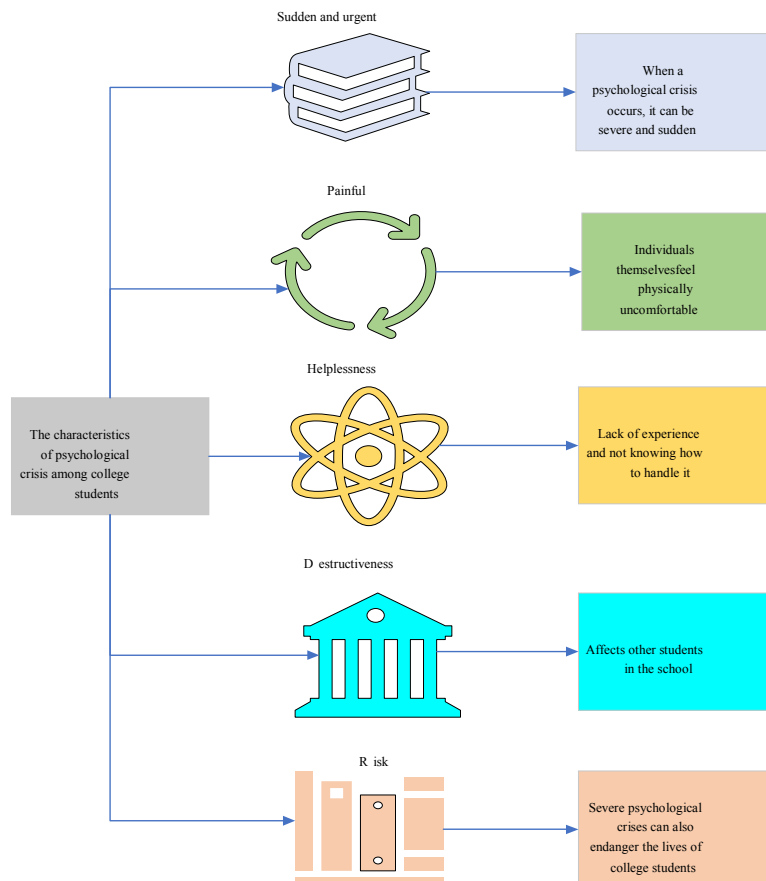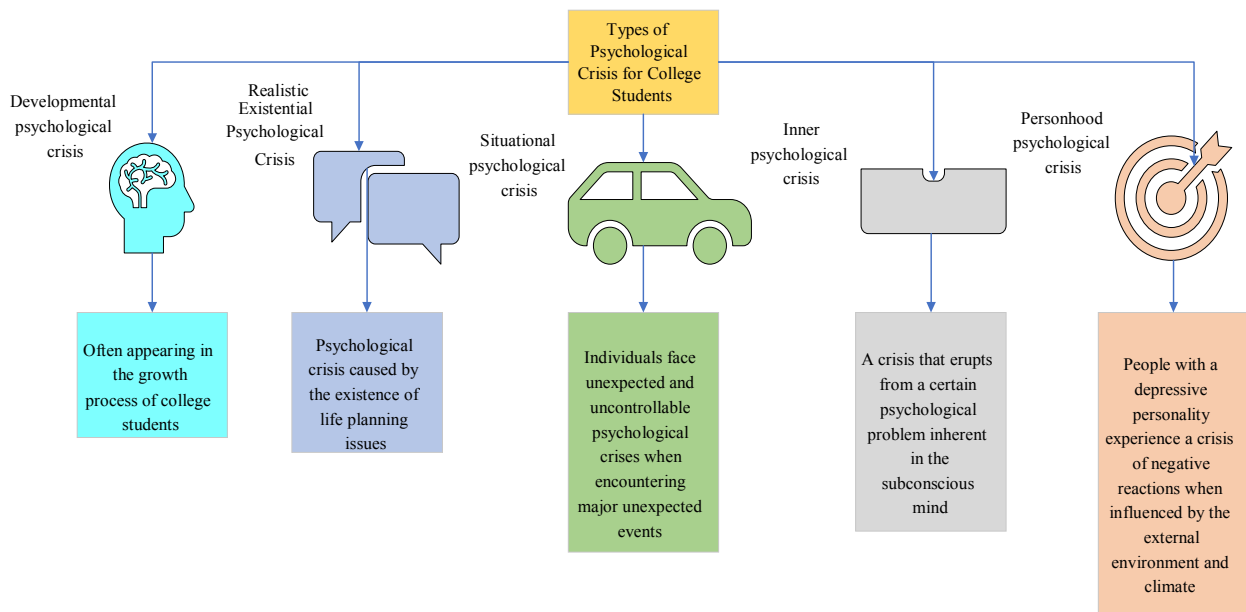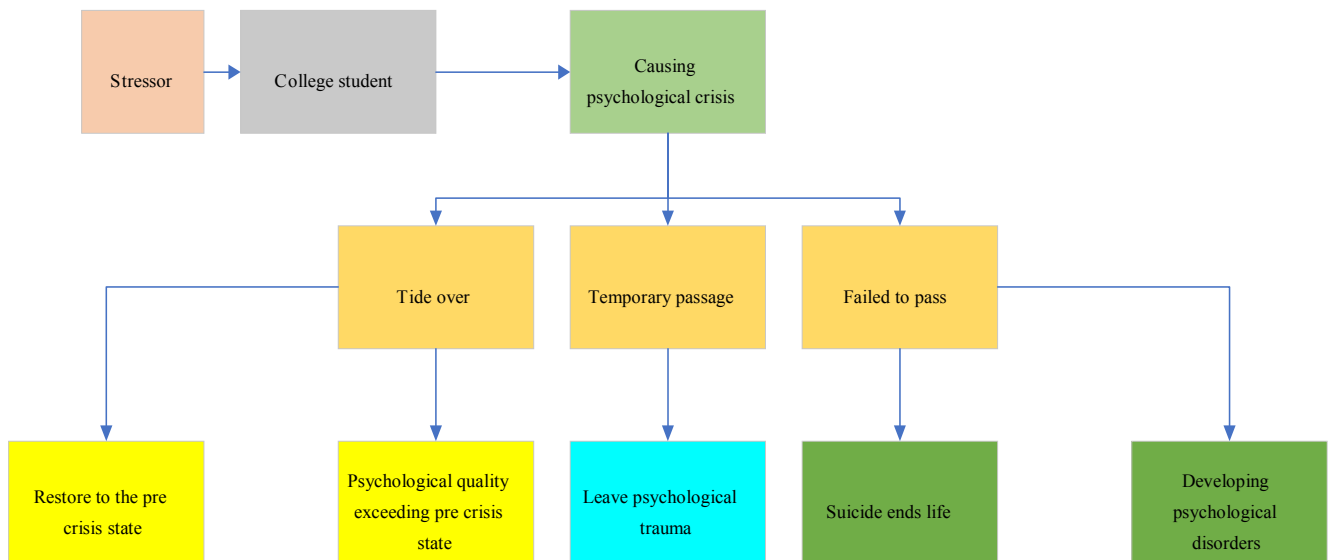
Figure 3   Classification of psychological crisis for college students (see online version for colours)

Figure 4   Possible consequences of psychological crisis among college students (see online version for colours)

College students are a particular group, whose psychological development is not fully mature, and their ability to withstand and deal with the psychological crisis needs to be stronger. Still, they all have thoughts and independent consciousness (Luan and Tsai, 2021; Balaskas et al., 2021; Wang and Park, 2021). For example, suppose you enter an unsatisfactory school after failing the college entrance examination. In that case, your psychology will always shadow your study and life, and a psychological crisis will thus breed (Cox et al., 2020). Psychological crisis intervention refers to when individuals encounter major emergencies, they can take timely coping measures, conduct psychological crisis intervention promptly, adjust their mentality and emotions and reduce the probability of malignant events caused by psychological crisis (Bantjes et al., 2021). Psychological crisis intervention is transient and urgent (Liu et al., 2021). It mainly helps people facing psychological crises to resolve the crisis, teaches them to find effective ways to deal with major emergencies on time, and restores their psychological balance (Akour et al., 2021). Its purpose is to reduce the damage degree of crisis and comprehensively improve the personality growth of the parties affected by the crisis (Arshad et al., 2020). Safety concerns, emotional support, declining mental health, negative behaviours, restoration of everyday functioning, constructive change and long-term psychological effects make psychological crisis intervention imperative. It seeks to stabilise people, make treatment more accessible, and stop more harm. After successful crisis intervention and adjustment, students' psychology will be developed and they will have a new understanding of crisis events, thus helping them accumulate experience to cope with future psychological crises (Browning et al., 2021).

3.2 *Psychological intervention using unsupervised learning NNs*

SEM can be transformed into a self-organising path-constrained NN, which has some basic features of self-organising NNs and their specific functions (Carfora et al., 2020; Goldberg et al., 2020). A self-organising path-constrained neural network that incorporates Structural Equation Modelling (SEM) faces several difficulties, including conceptual mismatches, complexities in model interpretation, a greater need for data, nonlinear connections, mathematical requests, risks of overfitting and data that is lacking. SEM represents unsupervised learning NNs (Elhai et al., 2021). SEM is a multivariate statistical method, which mainly analyses the relationship between variables based on the covariance matrix of variables (Andersson et al., 2021). In SEM, unsupervised learning neural networks play a vital role in pattern recognition, data exploration and latent variable identification. In addition to established approaches, autoencoders improve model fit and provide insights into data structures by extracting latent variables from compressed information. Combined with the confirmatory factor analysis and econometric models, this model is mainly used to analyse the causal hypothesis relationship between latent variables (Hu et al., 2021). A statistical method called Confirmatory Factor Analysis (CFA) establishes the presence of latent components that underlie observable data and serve as a basis

for investigating causal hypotheses. However, econometric models ensure precise measurement of constructs and thorough assessment of causal links by analysing economic interactions and evaluating hypotheses. The analysis steps of the SEM are shown in Figure 5.

Model setting systematically represents theoretical models by linear equations (Lamb et al., 2021). In SEM, the hypothesis model provides conceptual clarity, aids in mediation and moderation analyses and improves interpretability, all of which contribute to the construction of better models and their transmission to a variety of audiences. In the application of SEM, an initial hypothesis model is established first. If the fit between the hypothesis model and the sample data is not ideal, the model is revised according to the relevant data indicators, and then the model is re-estimated to establish a suitable model (Tebbeb et al., 2022). The relationship between latent variables is expressed by a structural equation, as illustrated in equation (1):

$$u = Bu + pc + c \qquad (1)$$

B indicates the relationship between endogenous latent variables; p represents the influence of exogenous latent variables on endogenous latent variables; c means the residual term of the structural equation and u refers to the relationship between the overall latent variables.

Figure 5 The main steps of SEM analysis (see online version for colours)
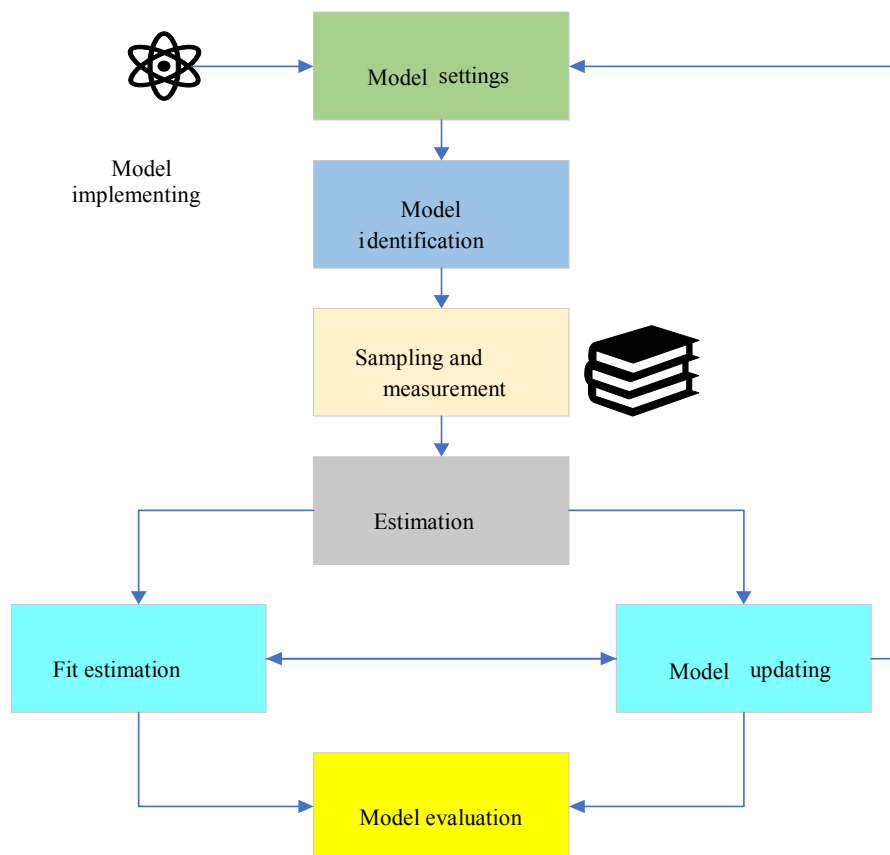
3.3 Psychological intervention of college students based on HCI under CA

To increase the effectiveness of an index system for psychological crisis intervention for college students, it is necessary to evaluate behavioural indicators, psychological wellness, academic performance, social interactions, risk evaluations for self-harm, coping mechanisms, mental health screening tools, communication patterns, support resources, cultural awareness and cooperation with health care providers. According to the form and object of psychological intervention of college students, the index system of psychological crisis intervention is established, as exhibited in Table 1.

Table 1 Index system for psychological crisis intervention for college students

| Primary indicators	Secondary indicators
Stressor	Learning pressure, autonomy and independence pressure, career pressure
Social environment	Family factors, school satisfaction, life satisfaction, parenting environment factors
Interpersonal relationship	Friendly relationships, romantic relationships, relationships with teachers and classmates
Stress response	Cognitive response, emotional response, willpower response, behavioural response, physiological response
Somatic symptoms	Somatisation, Compulsive Symptoms, Psychiatric

According to the research, individuals with negative events triggered by psychological crises are not good at handling interpersonal relationships. College students frequently face psychological crises as a result of pressure from their studies, problems in their relationships and social lives, money worries, mental health conditions and a lack of coping mechanisms. Proactive mental health efforts, easily available support services and a campus culture that prioritises the well-being of students are necessary to address these concerns. Emotional anguish, reduced cognitive function, social disengagement, communication difficulties and shifts in one's self-perception are all consequences of psychological crises that can impact relationships with others. Therapy, supportive treatments, and a robust social support system are essential for mending these connections. They are bad at talking to friends and relatives to release their troubles and pressure, resulting in increased psychological pressure and psychological crises (Ibrohimjon, 2022; Vermote et al., 2022). Therefore, the interpersonal relationship reflects the severity of the psychological crisis to some extent (Aruta et al., 2022). As a result, this study chooses social environment, stress response, stressors, somatic symptoms and interpersonal relationships as screening indicators

(Zada et al., 2022). Subjectivity, cultural sensitivity and low predictive power are some of the drawbacks of psychological crisis intervention screening indicators. The efficacy and morality of crisis intervention can be improved by using a comprehensive strategy that incorporates screening, clinical evaluations, cultural competency and an awareness of unique situations. A variety of techniques, such as self-report questionnaires, standardised instruments and professional interviews, are used to evaluate the severity of psychological crises. These metrics take into account the social environment and stress reaction, offering a thorough grasp of the circumstances surrounding the crisis and its contributing elements. The social environment indicator means the situation of individuals and their families and is not affected by external factors. Individual background indicator is selected as an external latent variable. The social environment may affect the indicators of the stress response, stressors, somatic symptoms and interpersonal relationships (Wingen, 2022). Through processes including socialisation, cultural influence, familial dynamics and peer interactions, the social environment shapes norms, values and behaviours that have a substantial impact on an individual's personality and interpersonal connections. It affects social skills, communication styles, identity and belonging, adding to the complexities of personality growth. The response of individuals to stress may affect somatic symptoms and interpersonal relationships, and somatic symptoms will also affect interpersonal relationships. Interpersonal relationships may be impacted by somatic symptoms, which can lead to communication problems, emotional distress and stress. While networks of support are important, stigma may cause isolation. Medical intervention together with adaptive coping mechanisms can aid in overcoming these obstacles. To sum up, the following assumptions can be made to analyse the relationship between latent variables, as outlined in Table 2.

Table 2 Assumption of the relationship between latent and observable variables

Assume	Assumption content
H1	Impact of stressor indicators on stress response indicators
H2	Impact of stressor indicators on body grip indicators
H3	Stressor indicators affect interpersonal relationship indicators
H4	Impact of stress response indicators on somatic symptom indicators
H5	Stress response indicators affect interpersonal relationship indicators
H6	Somatic symptom indicators affect interpersonal relationship indicators

The data fitting model is established according to the assumptions, as plotted in Figure 6.

Figure 6 Path map of data fitting model (see online version for colours)
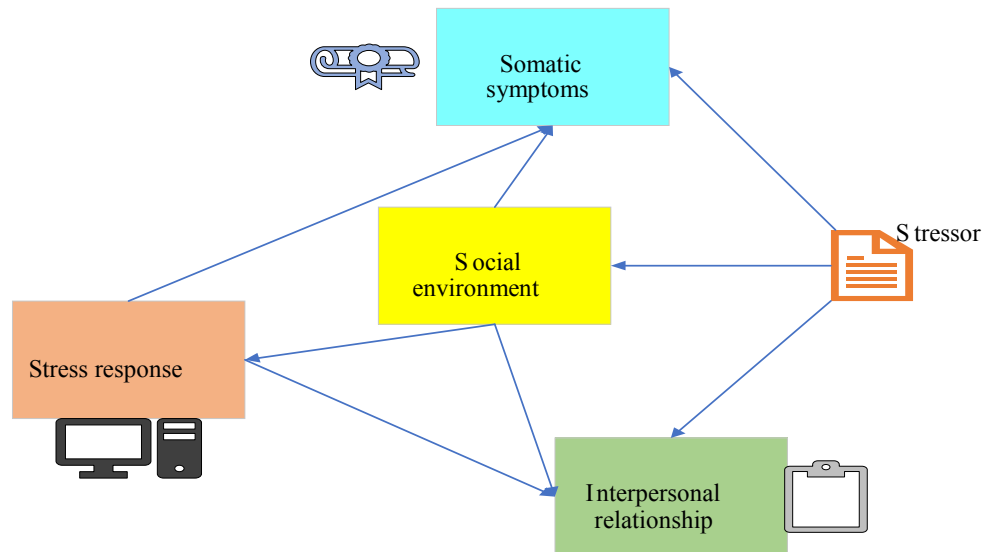
Model fitting degree estimation is the fitting of measurement data with SEM, and some fitting indexes are used as standards to judge the fitting degree. It is not only to judge the fitting index but also to judge the rationality of the estimates of each path parameter. Model modification is to add or remove some parameters of the model to improve the model's fit.

4 Analysis of psychological intervention model of college students based on the unsupervised learning NNs

4.1 An analysis of the moderating effect of the psychological intervention model for college students

The experiment is conducted in HCI mode, and the experimental environment and parameter settings are detailed in Table 3.

Table 3 Experimental environment and parameter settings

Facilities	Model
Central Processing Unit (CPU)	2.5 G
Operating system	Windows7
Web	Apache-tomecat6
Memory	12 G
Experimental samples	300
Normalised fit value	0.05
Compare fit values	0.95

The experiment selects stressors as independent variables, interpersonal relationships as dependent variables, and social support as moderating variables, all continuous variables. The interaction between stresses, interpersonal relationships and social support is examined via the experimental design. Interpersonal interactions are dependent, whereas stressors are independent factors. One moderating component that is added is social support. With practical implications for therapies, the study intends to shed light on interpersonal relationships, stress dynamics and the buffering impact of social support. The results of correlation analysis and moderating effect analysis of social support, stressors and interpersonal relationships are suggested in Figure 7. Finding variables, gathering information, verifying hypotheses, computing correlation coefficients and interpreting the findings are all part of correlation analysis. Analysing moderating effects looks at whether a third variable affects relationships. Software for statistics is employed, such as R, Python or SPSS. The study analysed variables and looked at moderation effects using a variety of statistical approaches, such as multiple regression analysis, correlation analysis and moderating impact analysis.

Figure 7 signifies an insignificant correlation between social support stressors and interpersonal relationships. Therefore, social support cannot become an intermediary variable, but it may become a moderating variable. In the moderating effect analysis, the measurement coefficient of only the utilisation of social support is 0.102, higher than 0.086, indicating that its moderating effect is very notable. Social environment refers to the living and learning environment in which an individual lives, which influences their personality and the development of interpersonal relationships. Social environment, interpersonal relationships and social support are selected as the independent, dependent, and moderating variables. The modelling effect analysis results and correlation analysis of social support with the social environment and interpersonal relationship are demonstrated in Figure 8.

Figure 7   Analysis of social support, stressor and interpersonal relationship outcomes (a) Correlation analysis results; (b) Analysis of moderating effects (see online version for colours)

(a)

(b)
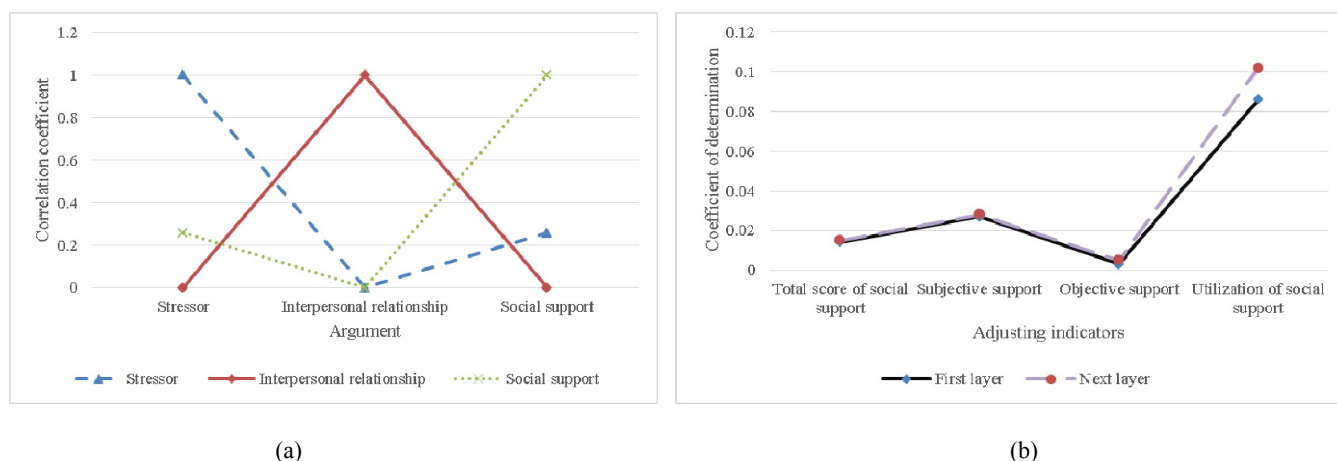
Figure 8   Analysis of the results of social support, social environment and interpersonal relationship (a) Correlation analysis results; (b) Analysis of moderating effects (see online version for colours)

(a)

(b)
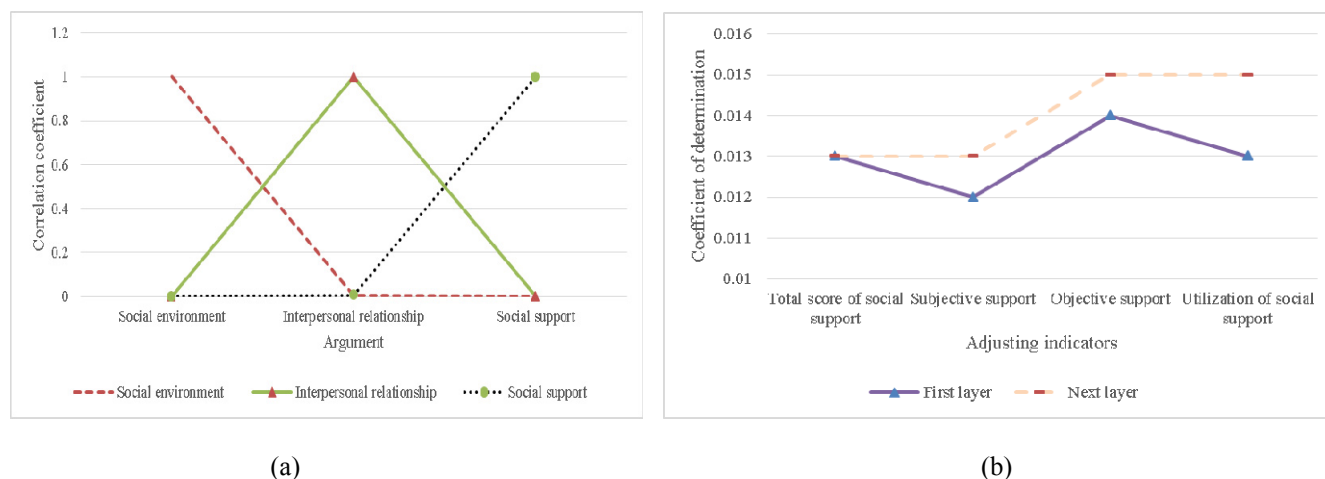
In Figure 8, social support has no significant correlation with the social environment and interpersonal relationships, so social support cannot become an intermediary variable. Careful research design is required since the lack of a substantial association between social support and interpersonal relationships might be ascribed to measuring difficulties, cultural variations and response bias. But it can be a moderating variable. The measurement coefficients of the total score of social support, subjective support, objective support and utilisation of social support are not prominent, and lower than the determination coefficient. That is, the moderating effect of social support is not conspicuous. It's critical to distinguish between psychiatric crises and regular stress or worry among college students to offer the right kind of help. In contrast to ordinary stress or worry, psychological crises are characterised by extreme emotional anguish, functional impairment, cognitive disturbances and the need for quick action. The stress response is a non-specific state of tension caused by the harmful effects of stress factors on animals. Relationships, communication, and health may all be negatively impacted by stress on animals since it can cause changed dominance, increased aggressiveness and reproductive changes. The effect is nuanced and contingent on the situation.

It can affect the development of interpersonal relationships. The correlation analysis of social support, stress response and interpersonal relationship and the moderating effect analysis results are expressed in Figure 9.

Figure 9 exhibits that the correlation between social support and stress response and interpersonal relationship is insignificant, so social support cannot be an intermediary variable but may become a moderating variable. The measurement coefficients of the total score of social support, subjective support, objective support and utilisation of social support are still lower than the determination coefficient, that is, the moderating effect of social support is not prominent. The somatic symptom is believed to be the result of psychological conflict and personality tendencies. Physical symptoms, mental health problems and compromised coping skills can result from stress reactions, somatic symptoms and interpersonal connections. Prolonged stress can lower quality-of-life and cause social disengagement and activity withdrawal. For the management of these issues, interventions such as medical and psychological assistance are essential. It is a neurosis characterised by persistent fear or belief in the superiority of various somatic symptoms. The correlation analysis and moderating effect analysis results of somatic symptoms, social support and interpersonal relationships are portrayed in Figure 10.

Figure 9 Analysis of the results of social support, stress response and interpersonal relationship (a) Correlation analysis results; (b) Analysis of moderating effects (see online version for colours)
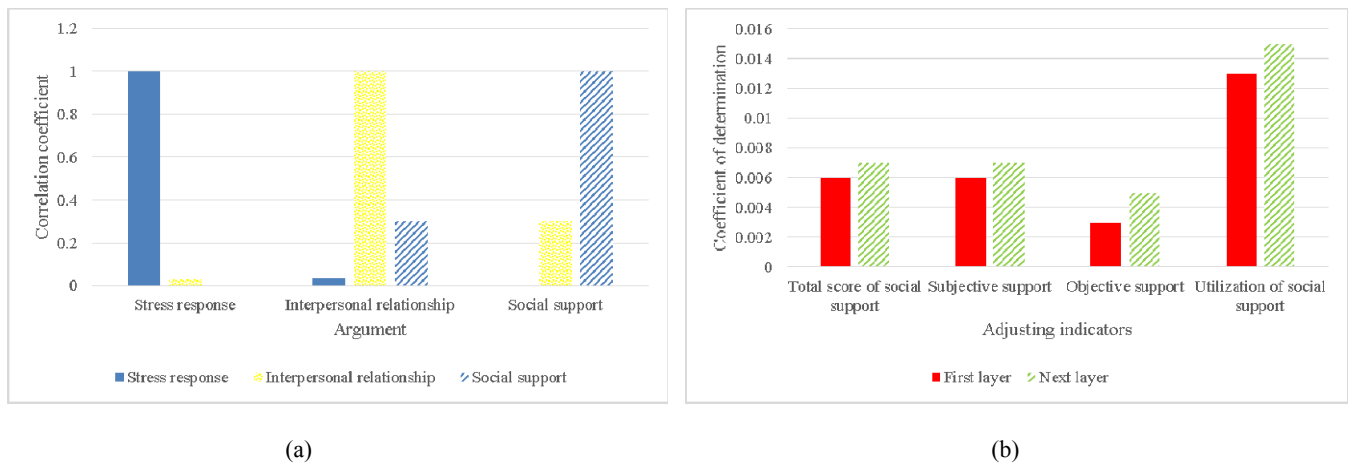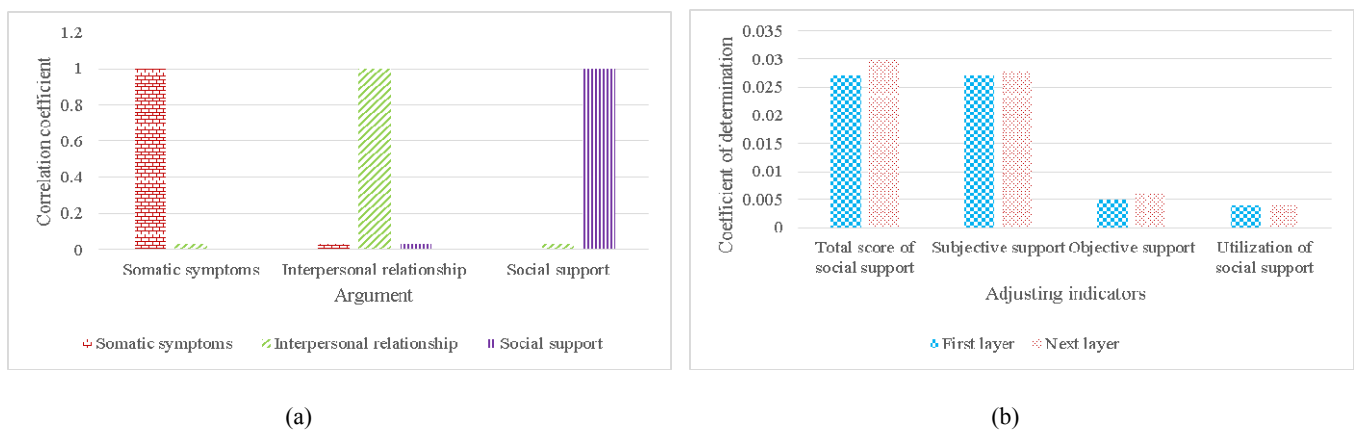

(a)

(b)

Figure 10 Result analysis of social support, somatic symptoms and interpersonal relationships (a) Correlation analysis results; (b) Analysis of moderating effects (see online version for colours)

(a)

(b)

In Figure 10, the correlation between the three indicators is insignificant. Thus, social support may not play a role in intermediary variables but can act as the moderating variable. The measurement coefficient of subjective and objective supports, the total score of social support, and the utilisation of social support are not markedly higher than the determination coefficient, which means that social support has no remarkable influence on the moderating effect. The current study suggests that social support may not regulate the relationship between somatic symptoms and interpersonal relationships. The effects of social support on somatic symptoms and interpersonal relationships depend on a person's perspective, coping mechanisms and chronicity in addition to environmental variables, cultural norms and personal action.

4.2 Classification of college students' psychological crisis and intervention measures

By assessing the psychological crisis of college students, the staff of psychological crisis intervention should make a quick and accurate judgment on the patients with psychological crises timely, grade the severity of the patients with psychological crises and take corresponding intervention measures. SEM is utilised to calculate the weight of the indicator layer, and the weight results were 0.35, 0.27, 0.19, 0.11 and 0.1. Combined with the HCI results, the classification results of psychological crisis personnel are set, as represented in Table 4.

Table 4 Emergency response system for the psychological crisis of college students

Severity	Intervention measures
Lighter	Mental health
Alert	Peer counselling, social support, mental health care, timely prevention and control and real-time monitoring
Higher	Psychological therapy, peer counselling, social support, timely prevention and control and real-time monitoring
Very high	Psychological therapy, timely prevention and control, real-time monitoring, timely referral, family companionship and social support
Serious	Emergency assistance, timely prevention and control, real-time monitoring, timely referral, psychological treatment, family companionship, security, media guidance and complete aftermath recovery

Schools can carry out mental health education lectures to explain to college students about mental health knowledge so that college students can recognise their psychological problems as early as possible. At the same time, the school set up special psychological counselling so that college students can understand how to deal with and solve psychological problems at any time. Hence, students can better adapt to social life, and maintain individual mental health.

5   Discussion

Based on the moderating effect analysis of the psychological intervention model of college students, it can be found that the utilisation of social support influences the relationship between stressors and interpersonal relationships. Stressors have detrimental consequences on animals' physiology, behaviour, reproduction, cognition and ecology. Reducing stresses is essential for ecosystem health, animal welfare and conservation. Relationships between stress and outcomes are moderated by social support, which also improves resources and protects people from harm. Its efficacy is influenced by cultural and environmental variables, which have an impact on well-being. After being stimulated by stressors, the higher the individual's utilisation value to social support, namely, the better the utilisation of social support, the greater the value of interpersonal relationship, that is, the better the interpersonal relationship. The issue of the utilisation of social support mainly refers to whether an individual chooses to obtain emotional and substantive support by talking to friends and family members when facing pressure and troubles or to solve the problem alone without seeking help from others. Only by making full use of social support resources, and sharing one's concerns and pressures with close people can one's interpersonal relationship be well maintained and psychological pressures be alleviated, thus avoiding psychological crisis. However, individuals who choose not to need help from others, do not talk to friends and relatives, and only rely on their ability to figure out problems are easy to produce symptoms such as autism and depression, the greater the possibility of psychological crisis. The risk of mental crises varies among complicated diseases like depression and autism. Autism is characterised by stress, sensory sensitivity and communication issues. Depression and autism frequently co-occur. Risk mitigation requires family support, specialised strategies and early action. Furthermore, the moderating effect of subjective and objective supports is not apparent except for the social support utilisation. Among the influences of social environment, stress response and somatic symptoms on interpersonal relationships, the moderating effect of social support is not outstanding. Compared with the study of Al et al. (2022), the unsupervised learning NNs in this study can learn and discover patterns and associations independently, thus providing higher flexibility and personalised intervention. Personalised profiling, early warning systems and interdisciplinary insights are provided by unsupervised learning neural networks, which efficiently handle large

mental health data sets for college students through techniques such as pattern recognition, clustering, anomaly detection, dimensionality reduction, feature extraction, topic modelling and temporal analysis. Compared with Asmolov's (2022) study, unsupervised learning NNs can handle larger data and extract more comprehensive and objective information, helping researchers better comprehend college students' mental health problems. The application of unsupervised learning neural networks to psychological therapies for college students is investigated in this paper. It evaluates the intervention plans and psychological crises of pupils, finding flaws in conventional approaches. To find latent connections and patterns, a structural equation model is built using the Human-Computer Interaction (HCI) methodology. According to the findings, social support is the most important moderating element. To address students' psychological crises, an emergency response mechanism has been put in place. This study advances psychological interventions for college students (Na et al., 2022; Shang and Sivaparthipan, 2022; Zhang et al., 2022).

6   Conclusion

Owing to the limited psychological counselling resources, traditional intervention methods cannot meet the requirements of all college students. Therefore, to facilitate college students' psychological intervention, unsupervised learning NNs are introduced to explore the relationship between latent variables of their psychology. First, this study analyses the psychological crisis and crisis intervention system of college students and finds that there are many shortcomings in traditional psychological intervention methods, such as the lack of knowledge popularisation and the imperfection of the management system. Second, SEM of unsupervised learning NNs is constructed using the HCI method, and a large amount of psychological data and information is analysed by CA to automatically excavate the potential correlation and pattern to find students' psychological problems and causes. Lastly, this study further proves the effectiveness of unsupervised learning NNs in the psychological intervention of college students through experiments. The experimental results manifest that the moderating effect of subjective and objective support is insignificant in the psychological intervention of college students except for the utilisation of social support. Besides, the moderating effect of social support is also not marked among the influences of social environment, stress response and somatic symptoms on interpersonal relationships. According to the calculation results, the weights of the indicator layer are 0.35, 0.27, 0.19, 0.11 and 0.1, respectively. There are also many shortcomings here. On the one hand, this study focuses on evaluating the effect of psychological intervention in college students in the short term but does not consider the long-term effect tracking. To more comprehensively understand the lasting effect of unsupervised learning NNs in the psychological intervention of college students, long-term follow-up studies will be conducted. On the other hand, this study only focuses on the

application of unsupervised learning NNs in the field of psychological intervention of college students and does not involve other possible psychological intervention methods or fields. Therefore, the scope of research will be further expanded to explore the application and effects of other psychological intervention methods.

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