

The Research on the Influence of Positive Psychological Intervention on College Students' Mental Health Based on PERMA Model

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Abstract: To investigate the impact of group positive psychological intervention based on the PERMA model on college students' mental health, this study provided empirical evidence for mental health education in higher education institutions. A randomized experimental design was employed in research methods, this study enrolled 33 college students from our university, who were divided into an experimental group (n=16) and a control group (n=17). Experimental group had undergone group positive psychological intervention on the basis of PERMA model whereas control group did not receive any intervention. The pretest and posttest assessment was done using Symptom Checklist-90 (SCL-90) and the analysis of data was carried out through non-parametric tests. For research results, this study summarized three points: (1) Prior to the intervention, the total SCL-90 scores of the two groups were not significantly different (P=0.958) which means that the groups are comparable; (2) Following the intervention, the total SCL-90 scores in the experimental group [122.00 (98.00,143.75)] were significantly lower than before intervention [135.50 (119.75,196.00)] (P=0.011), whereas there were no significant differences between the control group before and after intervention (P=0.097); (3) Following the intervention, the total SCL-90 scores of the experimental group were significantly lower than those of the control group (P=0.041) and the change of the experimental group before and after intervention [21.50 (2.25,38.75)] was significantly higher than the change of the control group [-9.00 (30.00,4.50)] (P=0.004). For conclusion, the positive psychological intervention based on the PERMA model has a positive effect in reducing SCL-90 scores among college students and enhancing their mental health levels, where the experimental group demonstrated better effects of the intervention in comparison to the control group. The research gives an operational intervention plan and empirical evidence to support the implementation of positively oriented mental health education in higher education institutions.

1. Introduction

Over the last few years, China has been developing its policy in the area of student mental health. The Ministry of Education released a new plan on mental health in February 2026, which requires

enhancing the early warning system of the national student mental health monitoring platform and an integrated strategy that addresses the whole concept of mental health education. The other related document of the "Guidelines on Building Healthy Schools" also focused on fostering the development of positive psychological qualities and resilience in students, and redirected the work on mental health into prevention and systematic management. These policy signals suggest that China is entering a strategic shift in its mental health education whereby the reactive mode of problem solving is replaced with proactive mode of promotion.

The psychological development and social adaptation of college students is a critical period of life with various developmental issues such as: academic pressure, adjustment to interpersonal relationships, building of self-identity and future career planning^[1]. There has been a similar finding reported by domestic studies indicating that modern college students frequently experience psychological issues such as anxiety, loneliness as well as lack of goals hence mental health is an important problem that affects their growth and development.

The conventional approach to mental health education uses the problem-oriented pathological model most frequently, which addresses the identification, diagnosis, and treatment of psychological disorders, usually offering remedials only when the problems are evident. Although this de-pathologizing strategy is required, it fails to consider the positive aspects of mental health-including well-being, psychological resilience and the growth of strengths. The current research is designed to examine how group positive psychological intervention, inspired by the PERMA model, can influence the mental health of college students by using an experimental design.

2. Literature Review

2.1 Positive Psychological Intervention

Positive psychological intervention is a technique based on positive psychology theory^[2]. In contrast to the conventional treatment, which relies upon the idea of fixing problems, it focuses on cultivating strengths, i.e., providing people with an opportunity to identify, cultivate and use their positive attributes by means of organized exercises and activities. The purpose of this is to promote positive change by raising positive factors, which will improve the level of well-being. Typical methods are the Three Good Deeds exercise, gratitude visits, and strength identification and application. It has a broader applicability as stated by Carr.

The application effects of positive psychological intervention were explained through literature review. A meta analysis of various studies on positive psychological intervention indicated that positive psychological intervention regardless of being administered face to face or online has a significant positive effect on well-being of clinical and non-clinical samples^[3].

2.2 PERMA Theoretical Model

PERMA model is a conceptual design of the concept of happiness proposed by Martin Seligman an American psychologist^[4]. The model does not merely focus on the old happiness theory of the concept of happiness as being solely about life satisfaction but happiness is defined as five dimensions, which are measurable and cultivable, namely positive emotions, engagement, relationships, meaning and achievement. All these five dimensions are interconnected and reinforcing each other forming the base of the individual's vibrant life. There is currently extensive use of the PERMA model in clinical practice and in education. The domestic researchers like Yang Jichao have incorporated the PERMA theory into the field of horticultural therapy, and established that the educational programs developed according to the principles of PERMA may systematically develop positive psychological traits of students. Students in particular fields have been found to

experience positive psychological interventions through the PERMA model effectively reducing social anxiety and increasing the level of subjective well-being^[5]. Intervention studies have been performed by foreign researchers on lung cancer chemotherapy patients based on the PERMA model framework, and findings indicate that the intervention was highly effective in enhancing post-traumatic growth among the patients. There were also significant differences between intervention groups and control groups regarding reduction of depression and anxiety. It means that the application of the PERMA framework to positive psychological interventions can be effectively used to reduce negative emotions and mental fatigue in lung cancer chemotherapy patients and raise their hope levels^[6].

Recently, researchers have begun to investigate the real-life implementation of positive psychological interventions (PPIs) informed by the PERMA model in the sphere of education and clinical practice, and their effectiveness has been confirmed in other studies. Nevertheless, there are not many systematic intervention protocols based on this model, and studies that examine the main indicators of college students mental health are not sufficiently common. The study carefully plans an intervention program taking into consideration all aspects of psychological development of college students, taking SCL-90 Symptom Checklist as a central measure of observation. It examines how PERMA-based PPIs influence the state of mental health of college students, and seeks to offer theoretical frameworks and practical directions on the related area of practice.

3. Study Design

3.1 Study Subjects

The participants in this study were volunteers taken out of the general population of college students. The inclusion criteria were as follows: (1) the student is currently enrolled; (2) the student participated voluntarily in the whole intervention and signed an informed consent form; (3) no presence of severe mental illness diagnosis.

In the study, a total of 33 eligible college students were enrolled and randomly divided into an experimental group (n=16) and a control group (n=17) through the use of a random number table. The participants of the study were aged between 18-23 years old.

3.2 Research Tools

Symptom Checklist-90 (SCL-90) is one of the most popular tools of mental health assessment among college students. It consists of 90 items assessing nine symptom domains, such as somatization, obsessive-compulsive symptoms, interpersonal sensitivity, depression, anxiety, hostility, phobia, paranoia, and psychoticism. The scores are rated on a 1-5 scale (1=absence of symptoms, 5=severe symptoms), and the higher the score the greater the severity of psychological symptoms and poorer mental health.

3.3 Intervention Design

According to the theoretical framework of the PERMA model and the real needs of the college students, this research developed eight group positive psychological intervention programs. An intervention period of 90 minutes was used and it was conducted one time per week during 8 weeks.

3.4 Research Procedures

The randomized experimental design, which consisted of pretest and posttest was used in this

research and the particular methods were:

(1) Pretest stage: Volunteers were recruited and potential participants were screened, after which they were randomly allocated to the experimental group and the control group. Each of the two groups filled in baseline measurements with the use of the SCL-90 scale.

(2) Intervention stage: The experimental group received 8 weeks (8 sessions) of group-based positive psychological intervention, where each session lasted 90 minutes. Control group had no interventions in this time (treatment started only after the experiment ended) and kept their daily study and living conditions.

(3) Posttest stage: One week after the intervention both groups completed another round of the SCL-90 scale assessment.

3.5 Statistical Methods

The data analysis was done through SPSS 22.0 software.

4. Research Findings

4.1 Normality Test

To determine whether the data were normally distributed, Shapiro-Wilk test was used. Total scores on SCL-90 before and after intervention in both groups. The findings indicated that the pretest P-values for the experiment were experimental group ($W=0.874$, $P=0.032$), posttest in the experimental group ($W=0.821$, $P=0.005$) and pretest in the control group ($W=0.849$, Pretest in the experimental group ($W=1.736$, $P=0.010$), posttest in the control group ($W=0.901$, $P=0.071$) were mostly less than 0.05, which means that the data failed to fit a standard distribution. As a result, all the following analyses were performed by non-parametric tests.

4.2 Comparative Analysis of the Two Groups

Before intervention, the median of the core indicators in the experimental group was 135.50 (119.75, 196.00), and that in the control was 142.00 (114.50, 177.50). To do this, the Mann-Whitney U test was used. The comparison between the baseline levels of the two groups is required, and the outcome showing $U=134.50$, $P=0.958 > 0.05$, which means that there was no statistically significant shows that the two groups were equal, which will be the basis of the further analysis of intervention effects.

4.3 Comparison before and after Intervention in Each Group

The Wilcoxon signed-rank test was used to compare the SCL-90 total scores between the experimental group and the control group before and after intervention. In the experimental group, the median SCL-90 total score was 135.50 (range: 119.75, 196.00) before intervention, which decreased to 122.00 (range: 98.00, 143.75) after intervention. The Wilcoxon signed-rank test showed a Z-score of -2.535 ($P=0.011 < 0.05$), indicating a statistically significant difference. The results demonstrated that after 8 weeks of active psychological intervention using the PERMA model, the SCL-90 scores of the experimental group of college students significantly decreased, and their mental health levels improved markedly.

Comparison between the control group before and after intervention: The median SCL-90 total score in the control group was 142.00 (114.50, 177.50) before intervention, and 160.00 (114.50, 222.50) after intervention. The Wilcoxon signed-rank test showed $Z=-1.658$, $P=0.097 > 0.05$,

indicating no statistically significant difference. The results demonstrated that the SCL-90 scores of the control group of college students who did not receive intervention showed no significant changes over the 8-week period, indicating relatively stable mental health levels.

4.4 Post-intervention Comparisons and Difference Analysis between the Two Groups

Post-intervention intergroup comparison: After intervention, the median total score of SCL-90 in the experimental group was 122.00 (98.00,143.75), while that in the control group was 160.00 (114.50,222.50). Mann-Whitney U test showed $U=79.50$, $P=0.041 < 0.05$, indicating a statistically significant difference. The results demonstrated that the SCL-90 scores in the experimental group were significantly lower than those in the control group after intervention, further confirming the effectiveness of the intervention measures.

Inter-group comparison of pre-intervention and post-intervention differences: As shown in Table 1, the median difference in the experimental group was 21.50 (2.25,38.75), while the median difference in the control group was -9.00 (-30.00,4.50). Mann-Whitney U test showed $U=58.50$, $P=0.004 < 0.01$, indicating a statistically significant difference. The results demonstrated that the decline in SCL-90 scores in the experimental group was significantly greater than that in the control group, indicating superior efficacy of the experimental intervention compared to the control group.

Table1: Comparison of Total SCL-90 Scores Between the Two Groups [M (P25, P75)]

group	sample capacity	Before intervention	After the intervention	D-value
experimental group	16	135.50(119.75,196.00)	122.00(98.00,143.75)	21.50(2.25,38.75)
control group	17	142.00(114.50,177.50)	160.00(114.50,222.50)	-9.00(-30.00,4.50)
P-value for intergroup comparison		0.958	0.041	0.004

5. Discussion

5.1 The Group Positive Psychological Intervention Enhancing the Mental Health Level of College Students Using the PERMA Model

This paper has found out that group positive the psychological intervention that is founded on the PERMA model can be useful. The average SCL-90 scores of college students will be lower, and it will greatly enhance mental health levels of all patients. It is a very similar outcome to current domestic and international research results that have been validated even more application worth of the PERMA model to the college students population.

Interestingly, the control group in this study also had a small rise in the scores after intervention on SCL-90 are not statistically significant. Some of the possible causes are more the academic pressure experienced towards the end of the semester will increase the psychological symptoms or natural variations. This phenomenon is also not directly related affirms the protective role of the intervention- significant score decreases in the experimental group during the same conditions indicate the intervention was effective in reducing possible stressors.

5.2 High Utility of the PERMA Model Applied to the Chinese Group

College Students. The use of SCL-90, a traditional mental health indicator, as the backbone variable, as this study has shown that positive psychological intervention not only does it enhance positivity (well-being) but also reduce negative (reduces psychological symptoms), showing dual effectiveness. The use of strict non-parametric testing approaches on a miniature the sample (N=33) offers methodological references to small-sample intervention studies.

6. Limitations and Prospects

The subsequent studies must be extended to increase the sample size and perform multicenter research cooperation. Secondly, the intervention period was just eight weeks, without long-term follow-up data, and the sustainability of the effects of intervention need to be validated again. Thirdly, the measurement tool only used one SCL-90 as the outcome measure, which did not evaluate the changes in all five dimensions of PERMA comprehensively. The next generation of research may include a happiness scale that is multidimensional measurement.

7. Conclusion

The first one is a positive psychological intervention using the PERMA model will be able to significantly lower the SCL-90 scores among the college students. The sum SCL-90 score has significantly decreased in the experimental group after in comparison with the situation prior to it, which means that the intervention greatly enhanced the state of mental health of college students.

The second point is the comparison between the control group and the intervention group did not differ significantly on the total score of SCL-90, which indicates the state of mental health of college students. The situation has been relatively stable during natural conditions and it is also important to note that emphasizes on the effectiveness of the intervention efforts.

Finally, the experimental group scored a total score of SCL-90 substantially less than the control group following intervention, and the gap between the two groups was much greater. This completely shows the positive impact of a positive psychology. PERMA model-based intervention on the mental health of college students.

To sum up, the group positive psychological intervention based on the PERMA model is a good strategy to improve college student experience. The present research offers practical treatment recommendations and the empirical data on mental health education in higher education organizations.

The future research can be developed by increasing the size of the samples, increasing the follow-up time frame, improving measurement indicators and exploring the mechanisms further, thus adding more value theoretical and practical knowledge about building a positive-oriented system of mental healthcare services to college students.

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