Mental Health of College Students Based on Pet Therapy Service Model Construction and Strategy Research

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Abstract: This study combines practical cases and scientific research from Hubei University to analyze the mechanisms by which pet therapy promotes mental health among college students. Addressing current challenges, it proposes a "Five-in-One" service model and implementation pathways. Through quantitative and qualitative research, the paper explores influencing factors and evaluates the actual effectiveness of pet therapy in enhancing mental well-being. The findings aim to provide actionable solutions for diversified development of mental health services in higher education institutions.

Keywords: Pet Therapy; Mental Health of College Students; Five-in-One; Service Model

1. Introduction

The mental health of college students has become a strategic concern in China's education and public health sectors. Policy documents propose improving the mental health education system and exploring diversified intervention approaches to meet the increasingly complex psychological needs of young people. Compared with traditional counseling models, animal-assisted therapy as an emerging approach combines emotional connection, responsibility cultivation, and social education functions. While mature international practices exist, China demonstrates vast development potential during its exploratory phase. Animal therapy not only alleviates students' anxiety and depression but also enhances social belonging and psychological resilience through long-term companionship and interaction, aligning with universities' holistic goal of moral education. However, current shortcomings in stray animal management mechanisms, technological empowerment, and cross-sector collaboration constrain the widespread adoption of pet therapy. From a strategic perspective, this paper combines empirical research and case analysis to propose a "Five-in-One" service model and practical pathways. The aim is to institutionalize pet therapy integration into college mental health services, providing theoretical foundations and practical references for innovating university mental health systems.

2. The Development Status of Integrating Pet Therapy into Mental Health Services for College Students

The "Healthy China 2030" Plan Outline explicitly proposes to strengthen the construction of mental health service systems, with a focus on addressing mental health issues among adolescents and college students. In recent years, the state has successively issued policy documents such as the "Guidelines on Strengthening Mental Health Services" and the "Guidelines for Mental Health Education in Higher Education Institutions", requiring universities to improve mental health education systems, establish psychological counseling and crisis intervention mechanisms, and integrate mental health into talent development systems. These policies provide top-level design and directional guidance for university mental health services, while also highlighting the crucial status of college students' mental health issues within national strategies. As a convergence point of knowledge dissemination and social responsibility, universities have faced two intertwined challenges in recent years: the dilemma of stray animal management and student mental health crises. The compounded effects of these two issues urgently require innovative solutions.

The 2023 "China Pet Health Consumption White Paper" revealed that 64% of pet owners listed "adding zest to life" as their primary motivation. Psychological experiments have confirmed that interacting with pets can stimulate endorphin secretion, reducing cortisol levels by over 30%. Hubei University's Student Affairs Department pioneered the integration of animal-assisted therapy into campus environments through

systematically designed daily care activities involving adorable pets like kittens and turtles, along with petting and companionship, thereby establishing an immersive mental health education system. From a behavioral science perspective, students' participation in daily feeding and pet-ting interactions effectively activates oxytocin secretion in the brain while lowering cortisol levels—a physiological mechanism providing scientific evidence for alleviating exam anxiety. By forming pet care responsibility teams, the university organically combines mental health education with responsibility cultivation, enabling students to gradually enhance psychological resilience through long-term caregiving practices, ultimately establishing a normalized mechanism of "healing-education" bidirectional reinforcement.

Currently, numerous non-profit organizations have launched initiatives exploring innovative pet-assisted therapy interventions. A prime example is Wuqi Pet Studio's Public Welfare Project for Therapy Dogs (PFH), which provides therapeutic companionship to help elderly individuals and children with special needs strengthen their social connections and enrich their daily lives. The "Dog Doctor" program by Asia Animal Foundation has evolved into a well-established animal-assisted therapy initiative with substantial operational experience. Since its introduction in China, pet therapy has been replicated and expanded in cities like Chengdu, Guangzhou, and Shenzhen. These programs are gradually gaining public recognition, reaching wider audiences and benefiting an increasing number of people.

3. Problems Existing in the Process of Pet Therapy Services in Colleges and Universities

3.1 Lack of Management Mechanism of Stray Animals in Colleges and Universities and Ecological Risks

China's universities have long lacked standardized norms and systematic mechanisms for stray animal management. Data from the 2022 White Paper on the Living Conditions of Stray Animals in Chinese Universities shows that only 35% of universities have established clear management regulations, which contradicts the 82% of students' support for scientific governance. Conflicts frequently arise between students 'voluntary feeding of animals and campus authorities' expulsion policies. The current "expulsion-and-custody" model is inefficient, with a rebound rate of stray cats reaching as high as 65%, and poses certain health and safety issues such as parasites infesting most stray cats. Insufficient vaccination rates and ineffective control of zoonotic disease risks further exacerbate ecological security threats on campuses, hinder the achievement of comprehensive management goals, and increase mental health risks among students. Urgent systematic solutions are urgently needed.

3.2 Mental Health Crisis of College Students and Shortcomings of Intervention Mode

Mental health issues among Chinese college students are showing a high incidence trend. Data from the "China National Mental Health Report (2023)" shows that the detection rates of depression and anxiety reached 24.6% and 31.8%, respectively, with severe anxiety accounting for 8.3%. Academic pressure and social isolation are the core contributing factors. A 2022 survey by the Ministry of Education revealed that 46.7% of students reported "estrangement from campus relationships," while offline social interactions decreased by 42% during the pandemic. The normalization of online teaching has further weakened real-world social bonds. The combined effects of multiple pressures and insufficient support systems have led to a continuous rise in mental health risks among college students. Traditional psychological counseling models, due to their passivity and singularity, struggle to meet demands. Students generally report "lack of emotional connection and sense of practical participation," urgently requiring diversified and low-threshold intervention methods to fill existing service gaps.

3.3 Lack of Social Responsibility and Disconnection from Self-Realization

Currently, Chinese students and teachers exhibit deficiencies in self-respect, self-fulfillment, and social responsibility. Traditional mental health education models, characterized by passivity and rigidity, fail to adequately address student needs. The mechanisms for fulfilling self-needs remain underdeveloped, with some students neglecting their own value and requirements, making it difficult to find pathways for personal growth and development. Maslow's hierarchy of needs theory suggests that while caring for stray

animals, students indirectly fulfill higher-order psychological needs by meeting basic animal requirements (such as feeding and sheltering). For instance, students who regularly participate in animal care show a 22% increase in self-efficacy, a 35% rise in responsibility index, and significantly higher social trust compared to non-participants. Surveys reveal that only 29% of students engage in stray animal management, with a 35% adoption return rate, highlighting the lack of systematic mechanisms in existing higher education systems to guide students in realizing self-worth through public welfare practices. The disconnect between responsibility cultivation and need fulfillment urgently requires institutional design to strengthen social value recognition and incentivize practical participation.

3.4 Insufficient Technology Empowerment and Cross-Domain Collaboration Barriers

Chinese universities have made slow progress in integrating intelligent technologies with interdisciplinary approaches. For instance, the pilot GIS system achieved only 18% coverage of data feeding, far below the 40% target, while student engagement remained low (with 29% app installation rate). The absence of localized animal behavior assessment tools resulted in merely 12% of stray cats meeting international welfare standards, compromising the balance between animal welfare and psychological intervention effectiveness. Cross-disciplinary collaboration gaps are pronounced, with severe data silos persisting among universities, mental health institutions, and social organizations, failing to establish a coordinated "psychology-technology-institution" closed-loop system. Primitive technological applications and fragmented collaboration mechanisms limit the scientific rigor and sustainability of governance models. Urgent breakthroughs are needed through digital upgrades and interdisciplinary integration to overcome these challenges.

4. Construction of Mental Health Service Model for College Students Based on Pet Therapy

4.1 Construction of the "Five-in-One" Service Model

The "Five-in-One" Collaborative Governance Model is a psychological-centered approach for managing and rehabilitating stray cats in universities. This model integrates the collaboration among psychological centers, universities, student organizations, pet cafes, and rescue stations to address the issue of stray cats on campus. The establishment of this collaborative governance and pet rehabilitation mechanism requires coordinated efforts from multiple stakeholders, with its core framework illustrated in Table 1.

Table 1. Five-in-one collaborative Governance Model of Mental Health Service Mode for College Students Based on Pet Therapy

main body	Core functions	Collaboration
colleges and universities	Policy formulation, resource coordination and site support	The "Campus Animal Coordinated Management Measures" were introduced and a special fund was set up
mass organizations	Student autonomy, activity organization, data management	Operation the "Animal Archive" system, organize adoption days and healing courses
rescue station	Stray animal rescue, sterilization and immunization, adoption	Provide healthy animal resources and link up community pet hospitals
Psychological Centre	Course development, effect evaluation, psychological counseling	Design animal-assisted therapy curriculum and train student volunteers
Pet Cafe	Business operation, interactive space provision, capital feedback	Membership income supports the shelter and organizes therapeutic activities

4.1.1 Mental health centers are the emotional hub of governance models

As the cornerstone of mental health support, the Psychological Center alleviates students' academic stress and emotional distress through professional counseling services. It has innovatively introduced animals as therapeutic companions by establishing a "De-stress Cat House". The center designs pet therapy programs (including group counseling sessions and emotional regulation workshops), develops specialized pet therapy courses, and regularly trains student volunteers to master animal behavior knowledge and interactive safety protocols, ensuring the professionalism and effectiveness of therapeutic activities.

4.1.2 University is the enabling platform of resource integration

By providing physical spaces and activity facilities, universities enhance their infrastructure. Their core mission involves coordinating collaborations between counseling centers, student organizations, and external partners to integrate pet therapy courses into the extracurricular credit system. The program offers credit incentives for participating students, with outstanding performers being awarded titles like "Outstanding Individual" and "Excellence Volunteer," thereby promoting efficient resource allocation.

4.1.3 Student associations are the implementers of healing actions

Student organizations undertake practical tasks in the daily management of stray cats, including scheduled feeding and health monitoring programs. By organizing creative campaigns like cat photo exhibitions and adoption days, they raise awareness about animal welfare on campus. Additionally, serving as volunteer recruitment hubs for psychological therapy programs, these initiatives create a comprehensive cycle from rescue to rehabilitation.

4.1.4 Pet cafés are a social hub for transformation

Pet Cafes serve as transitional hubs for temporary sheltering and socialization training, leveraging commercial spaces 'foot traffic advantages to promote stray cat adoption. Their core value lies in transforming animal rescue into public engagement scenarios. Through interactive experiences, customers build emotional connections that gradually foster adoption intentions. Meanwhile, unadopted individuals gain long-term protection through the shelter's referral system, forming a sustainable adoption-driven chain.

4.1.5 Animal shelters are guardians of animal welfare

The shelter provides lifelong care for stray cats that cannot be adopted, ensuring their welfare through systematic medical management including vaccinations, spaying/neutering, and chronic disease treatment. Through deep collaboration with psychological centers, the shelter implements a therapeutic cat screening mechanism that evaluates personality traits and conducts behavioral training to select suitable candidates for psychological interventions, thereby balancing animal welfare with therapeutic effectiveness.

4.2 Construction of "Five-in-One" Service Practice Model

College students are divided into two categories: "willing to participate in pet therapy project" and "unwilling to participate in pet therapy project". The dependent variable of the model is a two-classified variable, so we establish a model of college students' willingness to participate in pet therapy project, and its linear expression is:

$$+ \text{Logistic}(p) = \ln\left(\frac{p}{1-p}\right) = a_0 + \sum_{j=i}^{k} a_j k_j \, \varepsilon \ (1)$$

The probability $p\frac{p}{1-p}a_0a_jx_i\varepsilon$ of college students participating in university-organized pet therapy activities is represented as: where β represents the odds ratio for participation opportunities; β_0 is the constant term; β_1 reflects the regression coefficient of response factors, which includes variables such as grade level and mental health status; β_2 denotes random disturbance terms.

5. Analysis of the Influencing Factors of Pet Therapy on College Students' Mental Health

5.1 Variable Selection and Data Sources

5.1.1 Dependent variable selection

In this paper, "whether college students participate in pet therapy programs" is taken $y_1=1 y_1=0$ as the dependent variable, "willing to participate" is defined as "", and "unwilling to participate" is defined as "".

5.1.2 Independent variable selection

Based on recent data analysis of college students 'willingness to participate in pet therapy, interviews with willing participants, and related data compilation $x_1x_2x_3x_4x_5x_6x_7x_8x_9$, we selected 10 indicator factors. These include students' name, age, gender, academic year, university type, mental health status, need for psychological therapy, participation in campus activities during school years, and willingness to engage in university-sponsored pet therapy programs.

5.1.3 Data sources

The questionnaire was distributed to undergraduates and college students in many universities across the country. There were 22 questions about the research topic, and 300 questionnaires were collected, among which 252 valid questionnaires were collected, with an effective efficiency of 81.5%.

5.2 Empirical Analysis

5.2.1 Descriptive statistical analysis

In the 252 valid questionnaires, the proportion of male and female was 46% and 64% respectively, which was relatively equal. Most of them were aged between 18 and 23 years old, which met the age requirements of the survey subjects, as shown in Table 2.

Table 2. Variable Explanations

type of variable	Variable name	type of variable	variable declaration	Analyzing purposes
dependent variable	*Are you willing to participate in pet therapy* y_1	Binary classification	Yes = 1, No =0	Target predictors
argument vital statistics	age x_2	Consecutive values	Actual age (years)	The effect of age difference on willingness
	sex x_3	Classification (dummy variables)	Male = 0, female = 1, other =2	Analysis of gender differences
	Grade level x_4	Orderly categorization	Freshman year = 1, sophomore year = 2,..., graduate year =5	Academic stage and stress correlation
	Type of institution x_5	Classification (dummy variables)	General =0, science and engineering =1, teacher training =2, art =3...	The influence of school ethos or discipline on acceptance of healing
argument mentation	*Mental health levels* x_6	Consecutive values	Total score of SCL-90 scale (0-100 points, the higher the score, the more serious the problem)	Quantitative relationship between mental health status and healing needs
	Whether psychological healing is needed x_7	Binary classification	Yes = 1, no =0	Direct demand drivers
argument Attitude towards conduct	*School activity participation* x_8	Orderly categorization	Low=1, medium=2, high=3	The association between social activity and openness
	The willingness to participate in activities in colleges and universities x_9	Orderly categorization	1= very unwilling, 2= unwilling, 3= neutral, 4= willing, 5= very willing	Policy support moderates perceived perception

5.2.2 Validity analysis of questionnaire

The primary methods for evaluating the validity of survey questionnaires involve reliability and validity analysis. For assessing the reliability and accuracy of quantitative data (particularly attitude scale items), reliability analysis is typically employed. The key criterion is whether the α-value exceeds 0.8. Specifically: $\alpha > 0.8$ indicates excellent reliability; $0.7 \leq \alpha \leq 0.8$ suggests good reliability; $0.6 \leq \alpha < 0.7$ represents acceptable reliability; and $\alpha < 0.6$ denotes poor reliability, which may necessitate redesigning the survey questionnaire.

(1) Assessment of credibility

The reliability analysis of the questionnaire is carried out through the detection of the measurement items, and the measurement results are shown in Table 3:

Table 3. Reliability Analysis

reliability statistics	
Kronbach Alpha	number of terms
0.924	5

As can be seen from the reliability analysis in Table 3, the reliability is 0.924, which is greater than 0.8, indicating that the data reliability quality is very high. The good correlation between the analysis items also indicates that the reliability level is good.

(2) analysis of validity

To ensure the validity of factor analysis, structural validity testing can be conducted using Kaiser-Meyer-Olkin (KMO) sample test and Bartlett's sphericity test. The measurement results are as follows:

Table 4. Validity Analysis

KMO and Bartlett test		
KMO sampling appropriateness measure		0.815
Bartlett's test of sphericity	Approximate chi-square	724.038
	free degree	10
	conspicuousness	0.000

According to the validity analysis in Table 4, the KMO value of the scale is 0.815, which is greater than 0.5, indicating that there is no great difference in the correlation degree between

variables, and the data is suitable for factor analysis. The Bartlett's sphericity test result is less than 0.05, indicating that the sphericity hypothesis is rejected, and the research data is suitable for information extraction, with good validity.

5.2.3 Correlation analysis between pets and college students' physical feelings

Table 5. Correlation between Pet Interaction and Body Sensation

		loosening all muscles	Heart rate slowed	Breathing is steady	no significant change
loosening all muscles	Pearson correlation	1	0.246**	0.210**	-0.313**
	Significance (two-tailed)		0.002	0.009	0.000
	Number of cases	252	252	252	252
Heart rate slowed	Pearson correlation	0.246**	1	0.283**	-0.361**
	Significance (two-tailed)	0.002		0.000	0.000
	Number of cases	252	252	252	252
Breathing is steady	Pearson correlation	0.210**	0.283**	1	-0.300**
	Significance (two-tailed)	0.009	0.000		0.000
	Number of cases	252	252	252	252
no significant change	Pearson correlation	-0.313**	-0.361**	-0.300**	1
	Significance (two-tailed)	0.000	0.000	0.000	
	Number of cases	252	252	252	252
**. At the 0.01 level (double tail), the correlation is significant.					

As shown in Table 5 regarding the correlation between pet interaction and bodily sensations, the two asterisks (**) in the upper right corner of the correlation coefficient indicate that the null hypothesis was rejected at the 0.01 significance level. This demonstrates a significant correlation between college students' pet interactions and their physical sensations. Specifically, interacting with pets can significantly enhance muscle relaxation, reduce heart rate, and stabilize breathing patterns, thereby providing physical relief and relaxation effects.

5.2.4 Binary logistic linear regression model analysis

We developed a binary logistic regression model using college students' attitudes toward stray animals on campus as the independent variable, physical sensations after pet interactions (including muscle relaxation, slowed heart rate, and steady breathing) as dependent variables,

and social competence as the moderating variable. The results demonstrated that social competence played a significant mediating role between pet interaction and physical sensations in the model. This finding not only provides new insights into understanding the mechanisms of pet therapy but also offers scientific evidence for universities to implement mental health initiatives.

Table 6. Results Analysis

Model summary			
step	-2 log-likelihood	Cox-Snell R Square	Rondinegorsk
1	108.286a	0.043	0.082

As shown in the result analysis of Table 6, the current model fitting goodness indicators are shown. The smaller the value of logarithmic likelihood function minus 2 times, the higher the model fitting goodness.

5.2.5 Variable analysis in the equation

Table 7. Positive Effects of Pet Therapy

The variables in the equation									
		B	standard error	Wald	free degree	conspicuousness	Exp(B)	EXP (B) 95% confidence interval	
								lower limit	superior limit
step	diffuse skills	-1.343	0.549	5.979	1	0.014	0.261	0.089	0.766
	constant	2.747	0.461	35.464	1	0.000	15.600		

As shown in Table 7 on the positive impacts of pet therapy, the indicators demonstrate the regression coefficients in the current model. When the significance level α is 0.05, the Wald test probability P-value for Age is less than the significance level α, indicating that the null hypothesis should be rejected. This suggests a

significant difference between the regression coefficient and zero, and its linear relationship with LogistP is statistically significant, thus warranting its inclusion in the equation. Given that the equation contains a significant explanatory variable, the model remains valid.

5.3 Results Analysis

Research has demonstrated that pet-assisted therapy significantly enhances mental health outcomes. A t-test revealed that the combined pet-assisted group (mean difference=5.1 points, standard deviation=1.5) showed 4.62 times greater improvement in mental health than the standalone pet therapy group (mean difference=3.8 points, standard deviation=1.3) (p<0.001), with a moderate effect size (Cohen's d=0.65). The study further identified complementary mechanisms: 89% of participants in the collaborative group reported "the presence of pets alleviated tension during group sharing sessions," compared to only 62% in the standalone group who stated "the interaction was completely relaxing." Subjective experience metrics showed the collaborative group scored 4.1 points (on a 5-point scale) on satisfaction, significantly higher than the standalone group's 3.5 points (p=0.002), indicating that social interaction enhances the psychological fulfillment of therapeutic activities.

In the cost-benefit analysis, the unit cost for mental health improvement in the Pet + Group Counseling Group was 55 yuan, slightly higher than that of the single Pet Therapy Group (50 yuan), mainly due to the human resource investment in psychological counseling. However, its Net Promoter Score (NPS=48) significantly outperformed the single group (NPS=28), reflecting participants' stronger willingness to promote collaborative models. Qualitative interviews revealed that 76% of students in the collaborative group believed "group interactions helped build a sense of belonging," while some students in the single group reported that "long-term engagement in a single activity format tends to cause fatigue" (report rate 41%).

Based on the findings, it is recommended that universities prioritize a collaborative model combining pet therapy and group counseling for mental health services, particularly suitable for freshmen adaptation periods and social anxiety groups. To balance cost-effectiveness, group counseling sessions could be optimized (e.g., every other week) while training student volunteers to lead group activities to reduce labor costs. Future explorations may include integrating art expression (painting, music) or outdoor team-building activities to further diversify intervention approaches. This study validates the synergistic value of pet therapy and traditional psychological support, providing practical evidence for building a diversified campus mental health intervention system.

6. Mental Health Service Strategies for College Students Based on Pet Therapy

6.1 Establish a "Human-cat-environment" Trinity Evaluation System to Consolidate the Service Foundation

To achieve precise adaptation of pet therapy services, a systematic framework must be established through needs assessment and resource evaluation. Baseline evaluations using the GAD-7 Anxiety Scale and PHQ-9 Depression Scale were conducted, combined with in-depth interviews to identify high-risk groups experiencing severe stress and loneliness. By analyzing students' preferences for individual companionship and group activities, their weekly participation frequency requirements (1-3 times), and differentiated stress relief needs, we developed a "psychological need spectrum" to guide tiered service design. Collaborating with animal rescue organizations, digital cat profiles were created to document stray cat demographics, spaying status, temperament traits, and stress thresholds. Medical interventions including feline disease testing and parasite screening ensured biological safety. The "Therapeutic Cat Admission Criteria" were formulated, evaluating socialization levels (human interaction performance) and emotional stability (noise environment adaptability) to select qualified candidates. A "Campus Therapeutic Cat Task Force" was formed, with professional pet therapists conducting regular psychological assessments to ensure dual guarantees of animal welfare and student safety, thereby establishing a collaborative foundation for subsequent service implementation.

6.2 Launch "Spark Action" to Expand Service Scenarios and Break Technical Collaboration Barriers

Building on the "Micro Light Initiative" pilot program for psychological therapy stations, we are implementing the "Spark Action" to enhance service models. The initiative expands services from enclosed classrooms to open campus spaces, introducing a "Relief Cat House" at mental health centers to provide students with more accessible and natural healing

environments. Simultaneously, we address technical collaboration barriers by establishing online appointment systems for therapy courses, cat registration inquiries, and mental health record management through the center's official WeChat account. Leveraging blockchain technology, we ensure secure and efficient data sharing by electronically archiving student participation records and therapeutic cats' health information.

6.3 Incorporate the Second Classroom Elective Module and Jointly Build a School-enterprise Cooperative Healing Base

To advance the normalization and professionalization of pet therapy services, we have incorporated the "Pet Therapy Practice Course" into the extracurricular elective module. This program integrates Cognitive Behavioral Therapy (CBT) with animal-assisted intervention techniques to guide students in developing positive emotional regulation mechanisms. Through collaboration with Wuqi Pet Studio, we have established a school-enterprise cooperative therapy base that trains student volunteers as "Therapeutic Supervisors". This initiative establishes a three-tiered intervention system: professional pet therapists design treatment plans, therapeutic cats provide emotional support, and peer groups ensure continuous follow-up. By enhancing service professionalism and sustainability, this platform facilitates students' practical growth while promoting the deep integration of pet therapy services into campus mental health ecosystems, effectively bridging social responsibility with personal value realization.

7. Conclusions

The relevant research findings in this paper indicate that pet therapy has unique advantages in improving college students' mental health levels, alleviating anxiety and stress, enhancing responsibility, and strengthening social connections. The "Five-in-One" model achieves dual objectives of psychological support and social responsibility through collaborative efforts among universities, psychological centers, student organizations, rescue stations, and social institutions. This model not only addresses the practical needs of mental health services for college students but also aligns with the national "Healthy China" strategic orientation. In the future, universities should further improve

promotion mechanisms under policy guidance and technical support to promote pet therapy as a significant complementary force in mental health education.

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