A Study on the Relationship Between Social Support, Psychological Capital, and Mental Health in Chinese Patients With Cervical Dystonia: A Structural Equation Modelling Approach

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Abstract: The study examined whether psychological capital mediates the relationship between social support and mental health among patients with Cervical Dystonia. Data were collected through online self-reported questionnaires from 210 Chinese patients with Cervical Dystonia. Descriptive statistics, correlational analyses, and structural equation modeling were performed to analyze the research data. Our findings showed psychological capital and social support were significant predictors of mental health, and the direct effect of social support on mental health was statistically significant and positive. The path coefficients of social support with mental health were significantly decreased when psychological capital was modeled as mediators. The study's findings highlight the importance of promoting external social support and internal positive psychological resources to enhance mental health and reduce the psychological impact of the disease.
***Keywords*:** social support; positive psychology; mental health; China; Cervical Dystonia

1. Introduction

Dystonia is the third most common movement disorder in adults after essential tremor and Parkinson's disease, characterized by sustained involuntary muscle contractions causing twisting movements and abnormal postures [1]. Globally, the prevalence of primary dystonia is approximately 16.43 per 100,000 people [2]. While it can occur at any age, it predominantly affects young and middle-aged adults, with a sex ratio ranging from 1:1.6 to 1:3.8 [3]. In China, the estimated prevalence is at least 27 per million, with a male-to-female ratio of 1:2.01 [4].

Cervical Dystonia (CD), or Spasmodic Torticollis, represents the most common form of focal dystonia [5]. It is characterized by involuntary neck muscle contractions leading to abnormal head postures and movements. Patients frequently experience non-motor symptoms including pain, fatigue, sleep disturbances, anxiety, and depression [6]. CD typically manifests during young and middle adulthood, a critical period for personal and social development. The condition often disrupts self-image, limits social participation, and impedes psychosocial development [7]. As many patients are family caregivers or breadwinners, CD-associated disability can substantially reduce their ability to support dependents, thereby increasing familial burden. The prolonged rehabilitation process and persistent symptoms frequently lead to frustration, anxiety, and depression, significantly diminishing quality of life [8].

According to social-ecological systems theory, environmental factors profoundly influence individual behavior. Understanding the mental health of CD patients therefore requires examination of both environmental and personal factors. Social support-defined as material or emotional assistance from social networks—serves as a crucial external resource that buffers stress, enhances adaptive functioning, and promotes psychological well-being [9]. Substantial evidence confirms its role as a predictor of mental health outcomes. A 17-year cohort study demonstrated bidirectional positive effects between social support and mental health [10].

Regarding personal factors, positive psychological capital (PsyCap) has gained increasing research attention. Rooted in positive psychology theory, PsyCap represents an individual's positive strengths that facilitate coping and adjustment during adversity [11]. Introduced by Luthans et al. [12], this construct comprises four core components: resilience, self-efficacy, hope, and optimism. PsyCap is considered a malleable psychological resource that can mitigate poor mental health. Empirical studies have consistently linked PsyCap with reduced anxiety and depression [13], with each dimension contributing positively to mental health [14].

Both social support and PsyCap significantly influence psychological well-being and development. Research indicates a strong positive relationship between these constructs: individuals perceiving more social support demonstrate higher levels of PsyCap [15], and social support facilitates increased optimism and positive emotions [16].

In summary, substantial evidence indicates that both social support and PsyCap are positively associated with and

predictive of mental health. We therefore hypothesize that PsyCap mediates the relationship between social support and mental health. While previous research has examined this mediating mechanism in specific populations—such as Zhang's study on bereaved parents of only children [17]—this relationship remains unexplored among CD patients. Furthermore, the mediating role of the complete PsyCap construct between social support and psychological well-being requires further investigation. The current study aims to address these gaps by testing three hypotheses in CD patients: (1) Social support positively predicts psychological well-being; (2) PsyCap positively predicts psychological well-being; (3) PsyCap mediates the relationship between social support and psychological well-being.

2. Methods

2.1 Participants and procedure

An online questionnaire was distributed via four WeChat groups for CD patients from July to September 2021. It took approximately 20–30 minutes to complete. Participants received clear instructions regarding the purpose and requirements of the study, and confidentiality was assured. All questions were mandatory to minimize missing responses. A total of 210 valid questionnaires were collected.

2.2 Measures

SF-12: A Chinese version of the short-form health survey was used. It comprises 12 items across eight domains, summarized into Physical (PCS) and Mental (MCS) Component Scores, each scaled from 0 to 100. Higher scores indicate better health. Cronbach's α was 0.79. The MCS represented mental health.

PPQ: Adapted from PCQ-24, this 26-item scale assesses four dimensions: self-efficacy, resilience, hope, and optimism, rated on a 7-point Likert scale. Higher scores reflect greater psychological capital. $\alpha = 0.93$.

SSRS: This 10-item scale measures objective support (3 items), subjective support (4 items), and support utilization (3 items). Total scores range from 12 to 66, with higher scores indicating stronger social support. $\alpha = 0.71$.

2.3 Data analysis

Data were managed in Excel and analyzed using SPSS 25.0. Descriptive statistics are presented as means, standard deviations, and percentages. As normality assumptions were violated, nonparametric tests were applied to compare mental health across categorical variables. Spearman's correlation analysis examined associations among mental health, social support dimensions, and PsyCap components.

Hierarchical regression was conducted to test mediation by PsyCap. Mental health (MCS) served as the dependent variable. Disease duration was entered in the first step as a control variable, followed by the three social support dimensions in the second step, and the four PsyCap dimensions in the third step.

Mediation was assessed following Baron and Kenny's approach: partial mediation is indicated if the path from social support to mental health remains significant but weakens after including PsyCap; full mediation is confirmed if this path becomes nonsignificant. Model fit was evaluated using GFI, AGFI, CFI (≥ 0.90), and RMSEA (<0.08). Bootstrap resampling (95% CI not containing zero) confirmed the significance of mediation effects. Analyses were performed using SPSS 26.0 and Amos 26.0.

3. Results

3.1 Participants' characteristics

Figure 1 presents the demographic characteristics of respondents and the corresponding distribution of mental health. A total of 210 Chinese CD patients completed the online questionnaire, within 68 (32.4%) male and 142(67.6%) female. The average age of the sample population was 40.37(SD=11.64) years, and the majority of them were married. Most of the participants had a university degree or higher (78.3%), and 33.3% of responders had the disease for ≤1 year.

There were no statistically significant differences in MCS scores between those of different genders, ages, education levels and marital status ($p>0.05$, see table 1), However, a statistically significant difference in mental health was observed among CD patients with different levels of disease duration. Specifically, CD patients whose duration of disease ≤ 1 year had a significantly higher level of mental health than those with a longer disease duration than 1 year ($P < 0.01$).

Table 1. Patient demographic and the distributions of mental health (n = 210)

Variable	N （%）	Mean (SD)	Mental health
Age		40.37(11.64)	
Gender			
Male	68（32.4）		44.21±11.80
Female	142（67.6）		46.33±12.72
Education level			
Primary and below	8（3.8）		45.71±6.67
Lower Secondary	63（30）		45.24±11.97
High School, Secondary School and Technical School	47（22.4）		46.48±12.53
College or undergraduate and above	92（43.8）		45.50±13.50
Marital status			
Unmarried	27（12.9）		41.90±10.63
Married	167（79.5）		46.26±12.78
Divorced or widowed	16（7.6）		45.51±11.12
Disease duration			
≤ 1 year	70（33.3）		42.50±12.9
1-2 years	40（19.0）		47.82±12.42
2-5 years	61（29.0）		49.23±10.89*
>5 years	39（18.6）		43.43±12.29

Note: *P ＜ 0.05, **P ＜ 0.01.

3.2 Correlation analysis

The correlations between mental health and different dimensions of social support and PsyCap are shown in Table 2. The results indicate that significant Positive correlations exist between mental health and all three dimensions of social support (P < 0.01) and all four dimensions of PsyCap (P < 0.01).

Table 2. The correlations of continuous variables (N = 210)

Variable	1	2	3	4	5	6	7	8
1. Self-efficacy	1.000	*						
2. Resilience	.484**	1.000						
3. Hopefulness	.585**	.450**	1.000					
4. Optimism	.513**	.339**	.665**	1.000				
5. Objective Support	.313**	.334**	.349**	.395**	1.000			
6. Subjective support	.230**	.082	.171*	.225**	.358**	1.000		
7. Utilization of social support	.305**	.213**	.303**	.338**	.364**	.436**	1.000	
8. MCS	.443**	.281**	.529**	.410**	.352**	.230**	.395**	1.000

Note: *P ＜ 0.05, **P ＜ 0.01.

3.3 Hierarchical regression analysis

As is shown in Table 3, the two subscales of social support, namely, Subjective support and Utilization of social support were significantly correlated with mental health, explaining 21.4% of the variance. Two subscales of PPQ, namely, Self-efficacy and Hopefulness, was significantly positively correlated with mental health, accounting for an additional 15.5% of the variance. In addition, disease duration was significantly positively correlated with mental health. The effect of Social support on mental health among Chinese CD patients was partially mediated by PsyCap. The results indicate that the regression coefficient (β) for the association between mental health and Utilization of social support attenuated from 0.281 to 0.178 when PsyCap was added to the model. Overall, these results indicated that PsyCap partially mediated the relationship between Social support and mental health.

Good fit of the SEM indicating the direct pathway from Social support to mental health and the indirect pathway which is mediated by PsyCap. The direct effect of Social support on mental health was estimated in the model (Figure 1), which turned out to be statistically significant and positive (β = 0.55). As is illustrated in Figure 2, there was a statistically

significant and positive effect of social support on PsyCap (β = 0.62) and a statistically significant and positive Influence of PsyCap on mental health (β = 0.40).

The path coefficients of social support with mental health were significantly decreased (β = 0.30) when PsyCap was modeled as a mediator. The bias-corrected and accelerated bootstrap test indicated a significant mediating effect of PsyCap between social support and mental health (a * b = 0.248, BCa 95%, CI 0 .250 to 0.149). Thus, Social support not only directly affects mental health, and also influences mental health indirectly by the PsyCap.

Table 3. The hierarchical linear regression analysis of mental health (N=210)

	MCS								
	Model 1			Model 2			Model 3		
	β	*t*	*p*	*β*	*t*	*p*	*β*	*t*	*p*
Block 1 Control variables									
≤ 1 year VS Above 1 year	.091	1.320	0.188	.118	1.881	0.061	.115*	1.989	0.048
Block 2 Social support									
Objective Support				.050	.715	0.476	.052	.814	0.417
Subjective Support				.245*	3.500	0.001	.131	1.933	0.055
Utilization of Social Support				.281**	4.031	0.000	.178*	2.705	0.007
Block 3 Psychological Capital									
Self-efficacy							.153*	1.988	0.048
Resilience							.009	.134	0.894
Hopefulness							.334**	3.977	0.000
Optimism							-.024	-.287	0.774
R^2	.008			.222			.377		
△ R^2	.008		0.188	.214		0.000	.155		0.000

*P < 0.05, **P < 0.01

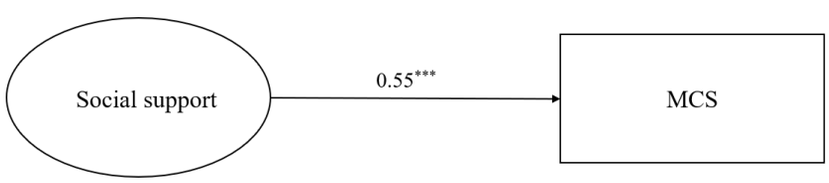

Figure 1. Structural equation modeling of social support and MCS. Standardized path coefficient is presented on the unidirectional arrow path

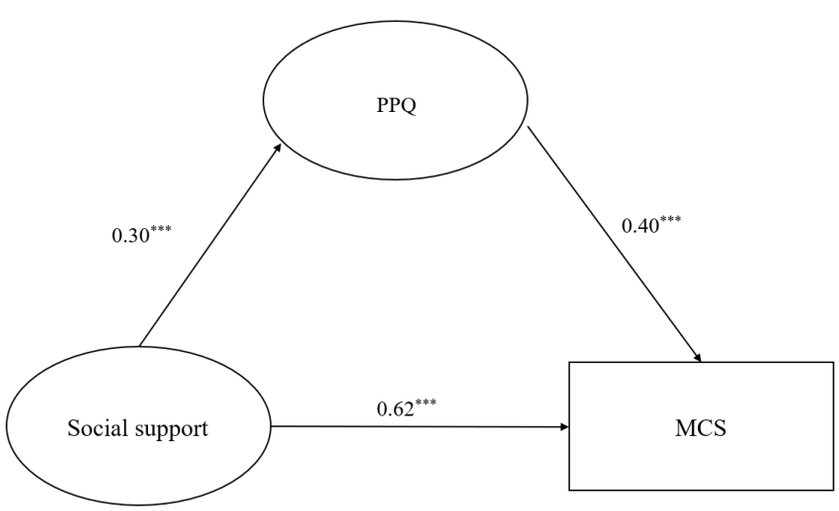

Figure 2. Structural equation modeling of mediating role of PPQ on the association between social support and MCS. Standardized path coefficients are presented on the unidirectional arrow paths

4. Discussion

To our knowledge, this study is the first to investigate mental health in Chinese patients with cervical dystonia (CD) and the first to explore the mediating role of psychological capital (PsyCap) between social support and mental health in this clinical population. Among the demographic factors examined, only disease duration demonstrated a statistically significant relationship with mental health outcomes. Specifically, patients with a shorter disease duration (less than one year) showed lower mental health scores, likely due to the psychological challenges of accepting their diagnosis and adapting to physical limitations during the early disease phase, a period marked by particular vulnerability.

The results indicate that social support serves as a significant predictor of mental health, as measured by the Mental Component Summary (MCS) of the SF-12. This finding aligns with previous research by Jibeen et al. [18] conducted among university students and is further supported by the work of Al-Gamal [19] in other clinical populations. Social support plays a crucial role in mitigating psychological distress, enhancing coping mechanisms, and fostering a positive subjective experience. Although CD patients have been found to experience social phobia at rates ten times higher than the general adult population and report fewer available sources of social support, their satisfaction with existing support underscores the importance of support quality over quantity. These findings emphasize the need to optimize both material and emotional support systems to improve psychological outcomes in CD patients.

A positive correlation was observed between social support and PsyCap, consistent with results from studies involving refugee populations where social support facilitated the development of psychological capital [20]. Similarly, PsyCap was positively associated with mental health, supporting Priscilla's [21] research which demonstrated that individuals with higher PsyCap exhibit greater optimism, employ adaptive coping strategies, and adjust more effectively to environmental challenges, leading to enhanced psychological well-being. The capacity of both social support and PsyCap to buffer against negative experiences is further corroborated by Yendork [22], highlighting their protective roles in mental health.

As hypothesized, PsyCap partially mediated the relationship between social support and mental health in Chinese CD patients. Social support not only exerted a direct influence on mental health but also operated indirectly through PsyCap — particularly the dimension of hope. Individuals reporting lower levels of social support were more likely to exhibit reduced psychological capital, which subsequently contributed to diminished mental well-being.

These results can be interpreted through the lens of cognitive-behavioral theory, which suggests that individuals' cognitive interpretations and self-perceptions shape behavioral responses to external events. Additionally, the social-ecological systems theory provides a framework for understanding how social support addresses fundamental psychological needs, thereby enhancing self-esteem and fostering positive emotions through supportive interpersonal relationships. Such positive psychological states encourage healthier behaviors and contribute to mental well-being, illustrating the dynamic interplay between external resources and internal capabilities in psychological development.

The study's findings offer valuable implications for clinical practice and intervention strategies. Rather than focusing on non-modifiable factors such as gender, efforts to improve mental health in CD patients should emphasize the development of PsyCap — a malleable and cultivable psychological resource. Interventions designed to enhance positive emotions, self-efficacy, hope, and resilience can help regulate negative affect, improve stress management, and promote healthier lifestyles. Given that social support positively influences PsyCap, integrated interventions that combine social support enhancement with PsyCap development hold particular promise. Future research should focus on designing individualized, evidence-based programs aimed at boosting PsyCap to improve psychological health in individuals with CD.

5. Limitations and Future Research

(1) This study was cross-sectional and used a self-report measure, therefore there is potential for response bias. Future studies should conduct prospective cohort studies to accurately document the developmental environment during childhood. (2) Additional confounders were not included in this study and the findings may be biased. Future research needs to include more relevant covariates that may moderate the relationship between social support, PsyCap and mental health. (3) There are many influential factors in the link between social support and mental health, and more mediating variables could be introduced for subsequent research.

6. Conclusion.

This study examined the effects of social support as an external factor and PsyCap as an internal factor on the mental health of individuals with CD. Focusing on the social support-PsyCap- mental health pathway, it was found that individual social support and PsyCap acted in a synergistic manner on mental health, and that PsyCap partially mediated the relationship between social support and mental health. Chinese CD patients in this study had poor psychological well-being,

especially those with a disease duration of <1 year. Therefore, psychological assistance such as psychological counselling and intervention (mental health services) for this population needs to be strengthened. External social support and internal positive psychological resources for individuals can be integrated to enhance the mental health of CD patients and reduce the psychological impact of the disease on patients by improving their social support and psychological capital.

Declaration of Conflicting Interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

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