



# Meta-research on the Correlation Between Psychological Capital and Occupational Burnout of Chinese Medical Staff

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**Abstract.** Meta-analysis is a statistical method of quantitative review and a statistical method of data. It synthesizes the existing findings, counts the data results of the research, selects certain criteria for comparison, and finally analyzes the trends to draw universal conclusions suitable for most groups. This study aim to evaluate the relationship between psychological capital and occupational burnout of domestic medical staff through Meta-analysis, and to provide a basis for alleviating occupational burnout. We analyzed a total of 405 literature which was retrieved from Web of Science, PubMed, Google Scholar, EBSCO, China Knowledge Network full-text Database, and meta analysis was carried out using CMA 3.0 software. Meta-analysis results showed that the psychological capital of medical staff was significantly negatively correlated with occupational burnout ( $r = -0.518, P < 0.01$ ). Among the four dimensions of psychological capital, the correlation coefficient between ‘optimism’ and burnout is slightly higher than that of other dimensions ( $r = -0.444, P < 0.01$ ). The analysis of the regulatory effect found that the differences in questionnaires and the publication time of the literature had significant differences in the relationship between the psychological capital of medical staff and occupational burnout. The relationship between the region, the hospital level, the type of literature published, the educational level of the subject and the gender of the survey subjects was not significant.

**Keywords:** medical personnel · China · Job burnout · psychological capital · meta analysis

## 1 Introduction

Job Burnout refers to a state of exhaustion of emotions, attitudes and behaviors that occurs when an individual is under long-term work stress [1]. Previous studies have found that job burnout is common among Chinese medical staff [2][3]. Serious job burnout will harm the physical and mental health of medical staff, affect the quality of medical services and even lead to medical accidents [4]. It is of great significance to improve the quality of medical services and meet the medical needs of the people by analyzing the formation mechanism of medical staff job burnout and exploring ways to alleviate the status of medical staff job burnout.

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For the formation factors of job burnout of medical personnel, previous studies have mostly discussed external factors such as work pressure, labor environment, and social support. Some scholars have also focused on the impact of age, position, and marital status of medical personnel on job burnout from a demographic perspective. With the rise of positive psychology and positive organizational science, psychological capital (PsyCap), as an important factor to promote personal growth and improve job performance, has gradually entered the vision of scholars. Studies have shown that psychological capital can effectively alleviate job burnout and is a new way to actively solve the old problem of job burnout. Through the summary of previous literature, it is found that few domestic scholars use the Meta-analysis to study it systematically, and there is a lack of systematic review on which dimension of activating psychological capital can have a more effective impact on job burnout. This paper systematically summarizes the relationship between psychological capital and job burnout. It intends to use the meta-analysis method to systematically and quantitatively analyze the relationship between psychological capital and job burnout, and explore the relationship between the two. At the same time, from the perspective of moderating variables, consider the impact of educational level, region, measurement tools and other factors on the relationship between the two.

## 2 Data and Methods

The literature was searched with '(job burnout or emotional exhaustion or depersonalization or low sense of achievement) and (psychological capital) and ( medical staff or doctors or physicians or nurses) ' as keywords or subject words. Search databases include: Web of Science, PubMed, Google Scholar, EBSCO, CNKI, VIP Chinese Science and Technology Journal Database. A total of 494 articles were retrieved from the database until July 2022.

### 2.1 Inclusion and Exclusion Criteria

Literature screening criteria combined with routine meta-analysis, inclusion criteria: ①Published papers at home and abroad; ②Research design was observational study; ③The subjects were Chinese medical staff; ④The research variables are psychological capital and job burnout; ⑤The result data reported the correlation between the two variables, and the effect index was  $r$  value; ⑥Language is Chinese or English. Exclusion criteria: ①Newspaper, conference and review articles; ②Repeated published literature; ③The subjects were non-Chinese medical personnel; ④The statistical method did not use Pearson correlation analysis.

### 2.2 Literature Screening and Data Extraction

Literature retrieval and information extraction were conducted independently by two trained graduate students, and disagreements were resolved by a third researcher. The literature coding information mainly includes the basic information of the literature ( author name + publication time), the number of samples, the amount of effect, the hospital level ( tertiary hospitals, tertiary hospitals, mixed hospitals), the proportion of

personnel with bachelor's degree or above, the gender ratio (the ratio of women to the sample group as the criterion), the region (divided into the eastern region, the western region, the central region, and the northeast region), and the type of literature (general papers, core journal papers, and dissertations).

### 2.3 Literature Quality Evaluation

Referring to the quality evaluation method in related research [5], the literature quality evaluation scale of this study was determined, including 1 sample selection: 2 points for random selection, 1 point for non-random selection, and 0 point for non-report; 2 data efficiency: data efficiency of 0.9 and above 2 points, 0.8 to 0.9 between 1 point, 0.8 or less than reported 0 points; 3 Internal consistency reliability of the scale: 2 points for 0.8 and above; 1 point between 0.7 and 0.8, 0 point below 0.7 or not reported; 4 publication level: core journal papers, dissertations, general papers scored 2 points, 1 point, 0 point. Included literature score below the theoretical average of 4 points, be excluded.

### 2.4 Statistical Method

CMA3.0 was used for data processing, and the correlation coefficient was used as the effect quantity. The homogeneity test is carried out by Q and I<sup>2</sup>. If the homogeneity test results show that Q is not significant, the fixed effect model is adopted; if the test results are significant, the random effects model is selected. Sensitivity analysis was performed by excluding the included literature. Finally, publication bias test was performed by funnel plot, loss of safety factor and Egger regression intercept test.

## 3 Results

A total of 494 articles were initially retrieved, and the literature was screened according to the inclusion and exclusion criteria. Finally, 30 articles were included, with a total sample of 8319 cases. The results of literature quality evaluation showed that the literature quality scores were 4 to 6 points, belonging to the medium quality level.

### 3.1 Meta-analysis Results

#### 1) Heterogeneity test

It can be seen from Table 1 that the Q test of the overall effect value and the effect value of each dimension between psychological capital and job burnout is significant ( $P < 0.001$ ), and I<sup>2</sup> ranges from 72.867 to 90.329, which indicates that the research is highly heterogeneous. Therefore, the random effect model was used for analysis [6]. The results showed that the effects of psychological capital and its four dimensions on job burnout were -0.422, -0.444, -0.417, -0.421 and -0.518, respectively,  $P < 0.001$ , representing a high correlation effect. Yang Yunfang's research has found that psychological capital can reduce the level of individual burnout by relieving the work pressure felt by medical staff [7]. Xi Ling's research [8] has shown that

**Table 1.** Heterogeneity test

variable	k	r	heterogeneity			confidence interval
			Q	df (Q)	I <sup>2</sup>	
optimism	24	-0.444***	237.822***	23	90.329	-0.504 ~ -0.379
tenacity	24	-0.421***	84.767***	23	72.867	-0.459 ~ -0.381
hope	24	-0.417***	157.543***	23	85.401	-0.468 ~ -0.364
self-efficacy	24	-0.422***	136.356***	23	83.132	-0.470 ~ -0.373
psychological capital	30	-0.518***	216.982***	29	86.635	-0.562 ~ -0.472

Note: k, the number of studies; r, effect size; Q, heterogeneity. \* means  $p < 0.05$ , \*\* means  $p < 0.01$ , \*\*\* means  $p < 0.001$

psychological capital indirectly affects the stress level of the role, thereby alleviating occupational burnout. Medical staff with a high level of psychological capital can relieve the symptoms of tension and anxiety through self-regulation, thereby suppressing the appearance of occupational burnout and maintaining physical and mental health.

## 2) Regulatory effect test

This study examined the moderating effects of six variables: publication time, literature type, education level, gender, region, hospital level and survey tools. Hospital grade, region, literature type and survey tool were classified variables, and subgroup analysis was used. Published time, education level and gender are continuous variables, using meta-regression analysis.

We tested the moderating effects of related factors on the relationship between psychological capital and job burnout of medical staff, As shown in Table 2 and Table 3. From the heterogeneity analysis results of the moderating variables in Table 2, there are significant differences in the impact of psychological capital on job burnout using different questionnaire. The reason for this result may be that the content of each survey scale is different. The MBI scale contains a total of 22 question items and uses the Likert 7-point scale for scoring; The MBI-GS scale is reduced to 16 question items on the basis of the former, and the scoring method is also changed from the 7-level scale to the 6-point scale; the NBS and Burnout syndrome screening scales are very different from the first two scales, consisting of 65 entries and 6 entries respectively. At the same time, there was no significant difference in the relationship between psychological capital and job burnout among medical staff in hospital level, working area and type of published literature. According to the analysis results of Table 3, there is no significant difference in the relationship between psychological capital and job burnout between the gender ratio and educational background of medical staff, and the time of literature publication plays a moderating role in the relationship between psychological capital and job burnout, and it shows that with the advancement of time, the correlation between psychological capital and job burnout of medical staff is stronger. This may be because the people 's

**Table 2.** subgroup analysis.

outcome index		k	heterogeneity		effect size	confidence interval	two-tailed test	
			Q	P			Z	P
hospital level	Third-class hospital or above	20	1.797	0.407	-0.532	-0.594 ~ -0.465	-12.880	< 0.001
	Second-class hospital or below	2			0.370	-0.600 ~ -0.084	-2.500	0.012
	Mixed hospital	3			-0.545	-0.625 ~ -0.454	-9.874	< 0.001
questionnaire	self-made scales	2	14.020	0.003	-0.516	-0.572 ~ -0.455	-13.976	< 0.001
	MBI-GS	12			-0.565	-0.655 ~ -0.460	-8.773	< 0.001
	MBI	10			-0.551	-0.594 ~ -0.505	-18.957	< 0.001
	NBS	5			-0.343	-0.450 ~ -0.227	-5.543	< 0.001
region	western china	3	3.071	0.215	-0.482	-0.572 ~ -0.382	-8.307	< 0.001
	eastern china	17			-0.561	-0.611 ~ -0.506	-16.203	< 0.001
	central china	9			-0.439	-0.621 ~ -0.213	-3.627	< 0.001
document type	general serial publications	23	4.753	0.093	-0.546	-0.599 ~ -0.487	-15.086	< 0.001
	core journal	5			-0.485	-0.513 ~ -0.455	-27.088	< 0.001
	academic dissertation	2			-0.352	-0.582 ~ -0.070	-2.425	0.015

Note: ①Mixed hospital represented researchers did not differentiate the hospital level.

**Table 3.** Meta regression analysis

variable	k	$\beta$	SE	confidence interval	Z	Q	P
Educational background	27	-0.276	0.196	-0.660 ~ 0.107	-1.470	2.000	0.158
sexuality	29	-0.194	0.314	-0.810 ~ 0.422	-0.570	-0.620	0.537
published time	30	-0.025	0.010	-0.045 ~ -0.005	-2.420	5.880	0.015**

**Table 4.** Publication bias test

variable	Nfs	Egger's Intercept	SE	t	P
optimism	9071	0.969	2.211	0.439	0.665
tenacity	7845	-1.157	1.302	0.889	0.383
hope	7866	0.226	1.806	0.125	0.901
self-efficacy	7719	-2.513	1.594	1.577	0.129
psychological capital	8564	-0.635	1.704	0.372	0.712

growing medical needs and the deepening of doctor-patient conflicts have increased the work pressure of medical staff and improved their psychological needs and job burnout.

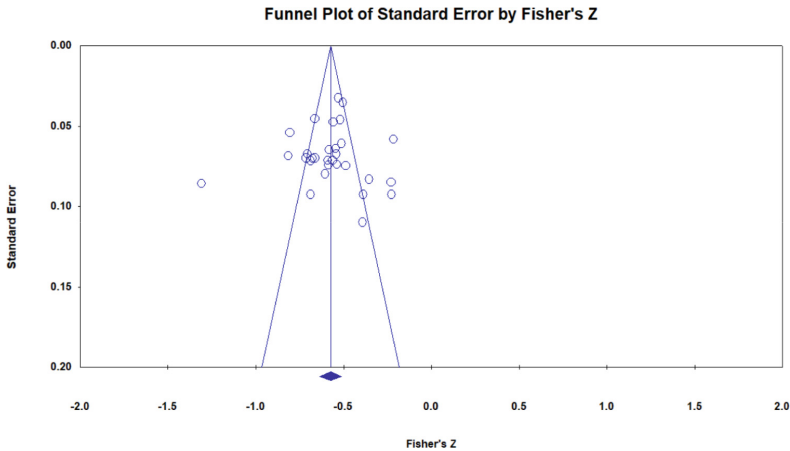
### 3.2 Sensitivity Test

By gradually excluding each study, the total effect size of the remaining studies was observed to test the impact of extreme values on the overall effect size. The results show that the fluctuation range of the effect size of psychological capital and its dimensions and job burnout is close to the total effect size, and always remains in the high correlation effect size, indicating that the results are relatively stable.

### 3.3 Publication Bias Test

The funnel plot and the safety factor *Nfs* and Egger regression intercept test were used to test the publication bias. The results are shown in Table 4 and Fig. 1. Figure 1 shows that multiple study effect values are close to the top of the funnel plot and more evenly distributed on both sides, indicating that publication bias is less likely to occur.

The overall level of psychological capital and the four dimensions of the safety factor *Nfs* are 8564, 9071, 7845, 7866, 7719, and the results of Egger regression intercept test showed that psychological capital and its four dimensions Intercept did not reach a significant level.



**Fig 1.** the funnel plot of meta-analysis.

## 4 Discussion

The overall level of psychological capital and its four dimensions are highly negatively correlated with occupational burnout, indicating that the higher the level of psychological capital, the lower the level of individual occupational burnout. Among the four dimensions of psychological capital, optimism has the largest correlation coefficient with occupational burnout, which may indicate that the regulation and maintenance of optimism may play a more important role in occupational burnout and have a more positive significance in alleviating occupational burnout.

The selection of questionnaire is the adjustment variable of the relationship between psychological capital and occupational burnout. Among them, the correlation between psychological capital and occupational burnout obtained by MBI and MBI-GS is higher and the correlation coefficient of NBS is the smallest. This prompts us to fully consider the influence of the selection of questionnaire on the relationship between the two in the future research on the relationship between psychological capital and occupational burnout.

The time of publication plays a regulatory role in psychological capital and occupational burnout. This result shows that the relationship between psychological capital and occupational burnout is getting closer and closer, which means that the psychological capital of medical staff is becoming more and more important for alleviating occupational burnout.

## 5 Conclusion

This study uses meta-analysis technology to technically integrate the results of previous research on the psychological capital and occupational burnout of medical personnel. A total of 30 articles were included in the literature from 2010 to 2022, covering four major regions of China, and a total of 8,319 medical personnel were investigated. The study

found that the psychological capital of medical staff was highly negatively correlated with occupational burnout, and the differences in investigation tools and time differences had a significant regulatory effect on the relationship between them. This study has the following limitations: Although this study collected research on the relationship between psychological capital and occupational burnout of medical staff as much as possible, it still failed to include all relevant literature; the research only included the type of literature, the time of publication of the literature, the region, the level of education, gender, hospital level, and survey tools. Other potential regulatory variables can be further explored in the future.

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