

# A Bibliometric Study on The Application of Progressive Muscle Relaxation Training in The Nursing Field in China

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**Abstract:** *Objective:* To systematically analyze the research status and application of progressive muscle relaxation training (PMRT) in the nursing field in China, and provide a reference basis for scientific research in this field. *Methods:* The bibliometric method was adopted in “progressive muscle relaxation training” or “PMRT,” and “nursing.” The established database was included in the China National Knowledge Infrastructure (CNKI) and the Wanfang Medical Network. The relevant articles in the Chinese Science and Technology Periodical Database (VIP) were analyzed. *Results:* A total of 169 literatures were included. The journals, years, and regions of literature publication were uneven, mainly originating from the eastern region (43.19%), and listed the application of progressive muscle relaxation training in the field of nursing in China. Intervention literature information was mainly dominated by experimental studies (97%). *Conclusion:* The related research and application of progressive muscle relaxation training in nursing in China is increasing, but there is a lack of objective evaluation of outcome indicators and a short intervention period. Further research should be conducted in the future to effectively guide the development of PMRT in the field of nursing in China.

**Keywords:** Progressive muscle relaxation training; Nursing practice; Bibliometrics

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## 1. Introduction

Recently, due to the advance of society, as well as the development of modern medical models and the continuous broadening of nursing research, progressive muscle relaxation training (PMRT) has become a commonly used behavioral therapy and is currently receiving much attention in clinical nursing practice <sup>[1]</sup>. PMRT has then been used as an adjunctive therapy. It has developed into a stand-alone training program that is widely used in the fields of psychology, education, medicine, and the technical service industry <sup>[2-5]</sup>. Among them, it is mainly applied in various aspects of the medical field due to its good clinical efficacy <sup>[6-11]</sup>. The development of PMRT in foreign countries were more complete due to earlier development and research. It has been proved that PMRT reduced the patient's stress, relieved somatic symptoms, improved their mood, immune function, and quality of life <sup>[12-14]</sup>. On the other hand, China had a relatively late start in the development of

PMRT. To comprehensively grasp the current status of research on PMRT in nursing practice in China and to deeply explore its future direction and development trend, this study adopted the bibliometric analysis method to sort and analyze relevant published literature in China, aiming to provide a reference basis for future research in this field.

## **2. Information and methodology**

### **2.1. Literature search strategy**

#### **2.1.1. Search database**

Computerized information was searched via the China Knowledge Network (CNKI), the Wanfang Medical Network, and the Wipro Chinese Science and Technology Journal Database (VIP). The search commenced from the beginning of the database creation to March 19, 2022.

#### **2.1.2. Search terms**

A comprehensive search was conducted using “progressive muscle relaxation training” and “PMRT” as keywords, subject terms, and free terms.

### **2.2. Inclusion and exclusion criteria**

Inclusion criteria: (1) Chinese journal papers published online from the time of library construction to March 19, 2022; (2) research content related to progressive muscle relaxation training in the field of nursing. Exclusion criteria: (1) Reports, patents, newspapers, conferences; (2) Literature for which full text was not available; (3) Extracts from foreign journal literature.

### **2.3. Literature screening**

The query results of all databases were entered into NoteExpress software and all duplicate articles were removed. The two graduate student groups were queried independently to screen the content of the articles after checking. The final decision on the number of articles to be included was made by screening titles and abstracts to remove irrelevant articles. Dissenting views were discussed and researched, and a third party was brought in to discuss the matter together if necessary.

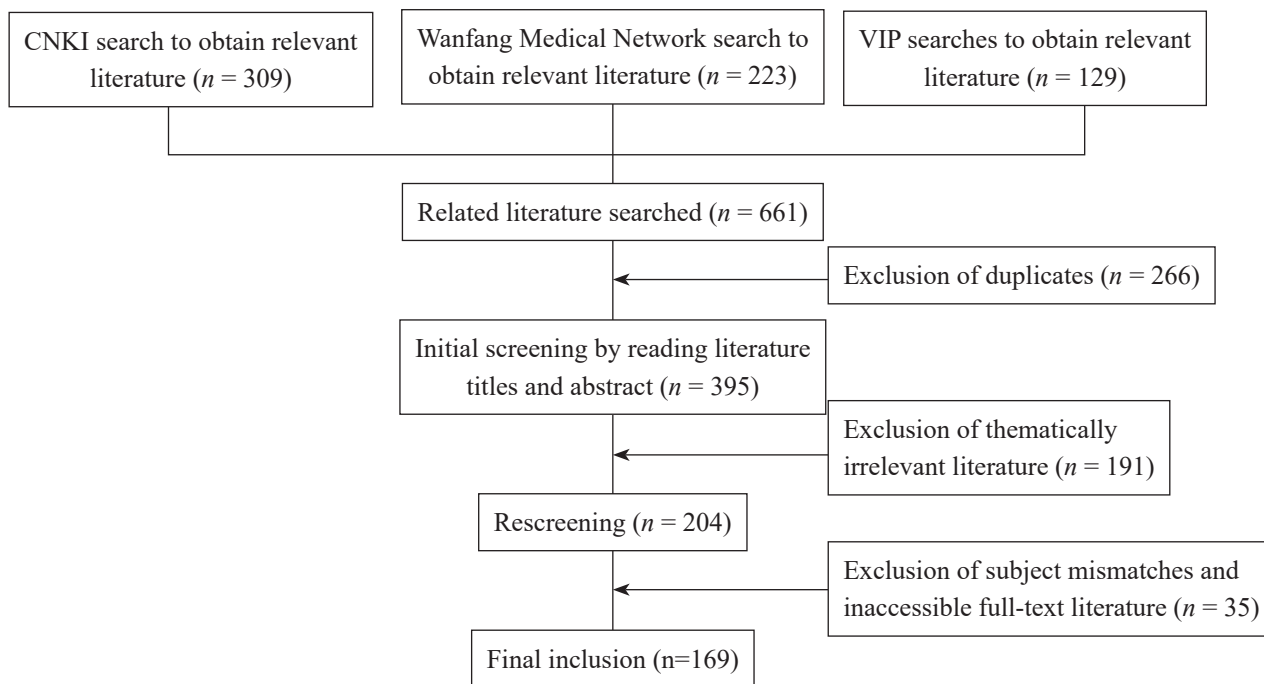
### **2.4. Literature analysis methods**

The Excel software was used to create a database to obtain information about the included literature, including authors, year, region, journal, type of study, study population, control measures, evaluation tools, evaluation indicators, and evaluation methods.

## **3. Results**

### **3.1. Results of literature search**

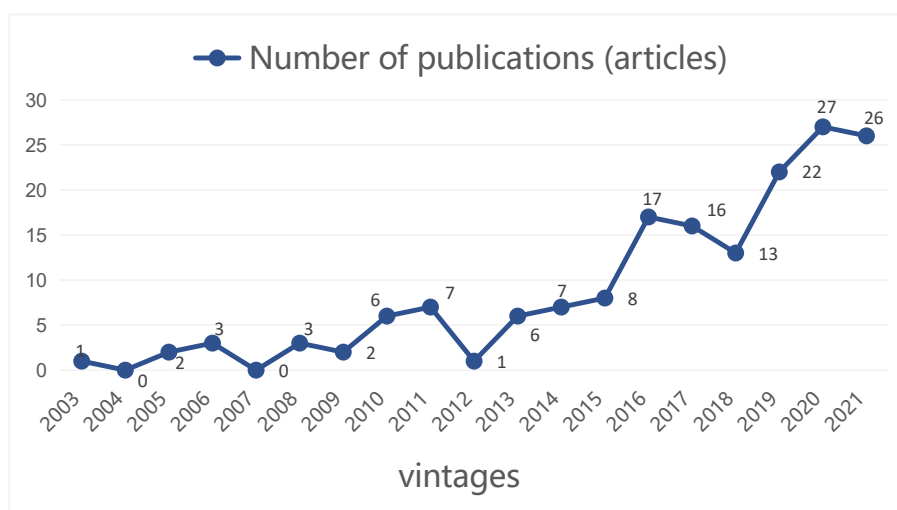
A total of 169 papers were included in this study after a screening process, as shown in **Figure 1**.



**Figure 1.** Flowchart of literature screening

### 3.2. Yearly analysis of the literature

The initial literature was published in 2003, with an upward trend in the last five years compared to the previous period. The peak of publication occurred in 2020 (27 articles), accounting for 16% of the total literature. Specific annual trends in literature publication are shown in **Figure 2**.



**Figure 2.** Annual trend of relevant literature in the field of progressive muscle relaxation training nursing in China by year of publication

### 3.3. Distribution of articles

As shown in **Table 1**, 151 articles were published in 95 journals, 16 nursing journals with 50 articles (33.11%), of which 20 articles (13.25%) were in the core of Beida, and 79 journals in other categories with 101 articles (67%).

**Table 1.** Distribution of journal papers ( $n = 151$ )

Journal name	Volume of publications	Percentage (%)
Chinese Journal of Modern Nursing	6	4.0
International Journal of Nursing	6	4.0
Nursing Research	5	3.3
World Journal of Sleep Medicine	5	3.3
general practice nursing	5	3.3
Journal of Nursing	5	3.3
International Journal of Psychiatry	5	3.3
Nursing Practice and Research	5	3.3
Journal of Continuing Nursing Education	4	2.6
Health and Wellness Guide	3	2.0
Modern diagnosis and treatment	3	2.0
Journal of Guangdong Medical College	2	1.3
PLA Nursing Journal	2	1.3
Systems Medicine	2	1.3
Journal of Nursing Management	2	1.3
Contemporary Nurses (upper issue)	2	1.3
Others	89	58.9

### 3.4. Regional distribution of literature

The results of this study were organized and analyzed according to the region of the first author. The 177 literatures included in the study came from 28 provinces, municipalities and autonomous regions in China, and the regional distribution of the literature on progressive muscle relaxation 2003 to 2022 is shown in **Table 2**.

**Table 2.** Regional distribution of progressive muscle relaxation training issuances from 2003 to 2022 ( $n = 169$ )

Region	Volume of publications	Percentage (%)
Guangdong	20	11.83
Jiangsu	19	11.24
Henan	19	11.24
Shandong	15	8.88
Shanxi	10	5.92
Other areas	86	50.89

### 3.5. Analyses of the types of studies in the literature

Analyses of the types of studies in the literature and the content of some of the intervention studies are shown in **Table 3**.

**Table 3.** Analyses of the types of studies in the literature

Type of study	Study population, duration of intervention, and form of intervention	Control	Research tools, evaluation indicators, and evaluation modalities
164 experimental studies (97%)	Study subjects: cancer patients (29 articles), limb fractures (13 articles), ectopic pregnancy (9 articles)	a. The number of articles in the literature on routine care is 147, representing 90% of the total number of articles, and the literature in this area examines the specific measures and care taken even when the diagnosis is made.	The top four were 55 Hamilton Anxiety Scale (HAMA), 43 Hamilton Depression Scale (HAMA), 38 Pittsburgh Sleepiness Index (PSQI), and 18 Quality of Life Scale (QOL).
5 reviews (3%)	The intervention period varied from 2 to 12 weeks.  Forms of intervention: single progressive muscle relaxation training, progressive muscle relaxation training combined with other non-pharmacological treatments, including stimulus control therapy, five elements of Chinese medicine and music, health education, music therapy, positive stress reduction, touch therapy, and guided imaging combinations totaling 53 articles (3%), progressive muscle relaxation training alone 111 articles (66%).	b. The number of literatures on mental health education is 10, accounting for 6% of the total number of literatures, which mainly expresses in detail the causes of the disease, as well as the treatment program and nursing care steps.  c. The number of literatures on nature observation is 7, which occupies 4% of the total literature, and the main concept used is the concept of doing nothing.	There were 95 papers using 1 evaluation indicator, 34 with 2, 27 with 3, 5 with 4, and 3 with 5 offerings.  The evaluation method was a questionnaire.
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## 4. Discussion

### 4.1. Nursing practice research based on PMRT is increasing and expanding

The concept of PMRT was proposed by Edmund Jacobson in 1935 and originally aimed to train individuals to acquire and perform the tension and relaxation of each muscle group through the cyclic alternating muscle relaxation pattern of “contraction-relaxation-contraction.” This activity aimed to control the level of muscle tension, maintain relaxation, and achieve the effects of anxiety relief and inhibit depression <sup>[15,16]</sup>. Domestic nursing research on PMRT started late from the beginning of the relevant research in 2003. After 14 years, the development of this research has significantly increased in speed. It was found that the increase in the number of literature has gone through a steady period, a period of upward development and reached a peak period thrice, respectively, from 2003 to 2015, 2016 to 2021, and reached the highest peak in 2020, at 27 articles. After continuous research and development, literature research covered almost all aspects of PMRT in the field of nursing. The research process was mainly based on experimental research. The total number of references obtained in this study was 169, of which 164 (97%) utilized experimental research methods, which showed that the scholars focused on evaluating and analyzing the results of the experiments using a scientific evaluation system when conducting their research. It has gradually expanded to overall treatment program development and treatment outcome assessment, where the scope of content mainly included middle-aged and young people, the elderly, and pregnant women, while the types of lesions mainly included diabetes mellitus, hypertension, cancer, malignant tumors, limb fracture, pregnancy, and other chronic diseases, and the content covers a multitude of aspects. However, currently, the degree of aggregation of relevant journals with papers related

to PMRT at home and abroad is insufficient, with a large range of sources and a scattered distribution. The emergence of this phenomenon may be related to the increase in China's attention towards modern nursing and emphasis on quality nursing services. These expectations thus contributed to the rapid development of PMRT in the field of nursing as well as the widespread application of related practices.

## **4.2. Analysis of the regional distribution of literature**

By considering region as the division requirement, the referenced literature was divided and analyzed and found that the eastern region of China had more relevant literature issued in this field. Among them, the main issuing regions were Shandong, Guangdong, Jiangsu, Henan, and Shaanxi. The possible reason for this is that these regions possess a higher level of economic and social development, which helps the people to focus on the improvement of the quality of life while addressing their basic survival needs. It can be seen that it pays more attention to PMRT and research. It is suggested that in the future, caregivers should pay attention to the research and clinical practice related to PMRT and explore ways to effectively intervene and improve their clinical quality. The results of this study showed that the nursing application of PMRT was focused on the eastern region of China, where the recognition of chronic disease control is relatively high, hence the widespread practical application of PMRT. At present, with the implementation of the national "Healthy China," the attention to chronic disease management is also increasing, and the implementation of PMRT can promote the balanced health of the whole region.

## **4.3 Analysis of literature research content**

Most of the 61 literatures with specific research subjects covered aspects such as cancer, limb fracture, and ectopic pregnancy patients. However, as confirmed by scientific research, PMRT has been applied to a variety of patients with physical and psychological symptoms, and effectively altered their physiological state and psychological condition <sup>[17-19]</sup>. PMRT has become an important part of nursing research. It has also been combined with non-pharmacological therapeutic modalities, including guided imaging combinations, music therapy, interactive guided imagery, haptic therapy, and health education, thus promoting the patient's postoperative recovery. Various studies have shown that PMRT was easy to master, can be practiced at any time, and has no side effects. PMRT techniques have been applied to various aspects of nursing care, with satisfactory results, which has resulted in a well-established psychological intervention of PMRT in nursing care. Patients can improve self-efficacy, reduce negative emotions, and improve their quality of life through relaxation training. However, there are limitations in this study. Research on PMRT only focused on short-term interventions and lacks long-term interventions and follow-up. In this study, only the scale was used as a measurement tool, hence objective indicators could be added appropriately to assess the effectiveness of the method. The use of PMRT has not yet been used professionally and studies on other diseases could be conducted appropriately. Due to individual differences, there is currently no well-established standard to evaluate the degree of muscle relaxation. There is also a lack of multicenter, large sample surveys. Therefore, it is necessary to further explore the feasibility of PMRT as a nursing operation to be promoted in clinical nursing practice as well as whether it should be included in the nursing education curriculum.

## **5. Summary**

The application of PMRT in the nursing field in China has been gaining attention and the intensity of research needs to be increased to optimize the research design and improve the research quality. Deeper and more in-depth studies should be conducted to promote the application and progress of PMRT in the Chinese nursing

field. In this study, only the more commonly used Chinese database system was used for literature search methodology, and the epistemological and methodological quality assessment has not been conducted. In the future, we can refer to and analyze the development of PMRT in the nursing field in foreign countries, and address the shortcomings in this study.

## Disclosure statement

The authors declare no conflict of interest.

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