Research on the Construction Path of Jiangsu Biomedical Talent Highland Based on Grounded Theory

Ruyi Wan[1], Fang Wu[1],*

[1]*School of International Pharmaceutical Business, China Pharmaceutical University, Nanjing, China*
*Corresponding author

Abstract: The current development momentum of the biomedical industry in Jiangsu Province is great, and an important factor for the high-quality development of the biomedical industry is the high-quality gathering of talents, which promotes the formation of a biomedical talent highland in Jiangsu Province. Based on this, this article aims to provide a path plan that can be referenced for the construction of a biomedical talent highland in Jiangsu Province. The Grounded theory is used to analyze the relevant policy texts and literature of Jiangsu province's biomedical talents, code and construct the key element model of Jiangsu province's biomedical talents highland construction level by level. Finally, the research conclusions are drawn and the countermeasures and suggestions for building the biomedical talents highland are proposed.

1. Introduction

In the "Outline" of the 14th Five Year Plan issued by Jiangsu Province in 2021, it is proposed to implement key talent projects, gather a group of "high precision and shortage" strategic scientific and technological talents, leading scientific and technological talents, and innovation teams, and cultivate a group of high-level engineers and high-level interdisciplinary practical talents. However, according to the data from the scarce talent demand catalog, the talent shortage index of the new pharmaceutical and life health industry chain currently ranks second, especially in the fields of biomedical research and development, clinical research, and medical device talents; In addition, the integration of intelligence agglomeration and industrial demand in Jiangsu Province needs to be deeply integrated, especially for the technology-intensive biomedical industry with long benefit return cycles, high investment, and high risks. Only through the interaction and collaboration between the talent chain and the industrial chain can the industrial development be further driven. Therefore, breaking the bottleneck problem in the construction of talent highlands in the segmented fields of the biomedical industry in Jiangsu Province and accelerating the construction of a biomedical talent highland is crucial for achieving high-quality development of the biomedical industry in Jiangsu Province.

2. Materials and methods

2.1. Source

The data sources for this study mainly include two parts. Firstly, the relevant policy texts for the construction of biomedical talent highlands at the provincial level in Jiangsu Province; The second is 33 key literature related to talents in the pharmaceutical field. On the one hand, the reason why policy texts are selected as analysis objects is because they have authority and coherence, objectivity, and accessibility. Considering the relevance and timeliness of the research, a total of 23 policies were screened from 2016 to 2022. On the other hand, literature is the most commonly used and indispensable basic information for academic research. Literature is usually written for a certain research purpose, with high objectivity and reliability. It can be used to discover and reveal the laws of historical process occurrence and development, and is suitable for the process research of building a biomedical talent highland in Jiangsu Province in this article. The author selected literature from 2017 onwards, and due to the large number of literature, considering the authority, timeliness, and consistency with this study, focused on selecting 33 literature.

2.2. Methods

Glaser and Strauss jointly proposed a qualitative research method, namely Grounded theory. The core idea of this method is to combine theory with practice, so as to achieve in-depth exploration of the problem. In the field of public management, some scholars have proposed four problem situations suitable for Grounded theory research, namely, factor identification problems, process interpretation problems, problems that are difficult to master, and new problems[1]. The application of Grounded theory in human resources research mainly focuses on factor extraction, capability evaluation and process interpretation. For example, Li Tuoyu and others used Grounded theory and combined with multiple case studies to build the innovative talent training model of China's new R&D institutions, and refined the core category relationship of "institutional endowment - core elements of talent training - talent training effectiveness"[2]; Ma Teng and others used the Grounded theory method to conduct case interviews with 10 teachers in China's world-class universities, collect the evaluation criteria for scientific research talents in various universities, and form an analytical framework for the ability of scientific research talents in universities[3].It can be seen from this that Grounded theory is very suitable and has been widely used in factor extraction, ability evaluation process interpretation and other types of research, so this study uses the Grounded theory method to analyze the strategy and path of biomedical talent highland construction has full rationality and feasibility.

3. Grounded theory coding

3.1. Open coding

Open coding is the process of transforming raw data extraction into concepts and categories, and it is the starting link of procedural Grounded theory. In this paper, 23 policy texts and 20 documents are taken as the analysis objects, and sentences or paragraphs that can clearly and completely express clear concepts are regarded as an analysis unit. Through abstraction of the core ideas contained in each analysis unit, relevant concepts and categories are finally obtained. Delete concepts that are clearly unrelated to the research topic, and then summarize and integrate the retained concepts, resulting in 38 categories. Due to space limitations, the open encoding of some policy texts is shown in Table 1.

Table 1: Initial Concepts and Categories Formed by Open Encoding (Partial)

Number	Policy text content	Initial concept	Category
1-1	Build a high-level scientific and <u>technological innovation platform</u>. Focusing on the major needs for the development of health care...become an important base for the research and development of new medical technologies, as well as for the cultivation of high-level medical talents.	Technological innovation platform	Research service platform
1-2	Accelerate the <u>construction of major innovation platforms</u>. Innovative demand for biomedical research and development targeting new targets, structures, and forms...efforts will be made to strive for more national level platforms such as technology innovation centers, industrial innovation centers, engineering research centers, and manufacturing innovation centers in relevant fields to be established in our province.	Major innovation platforms	Research service platform
2-1	<u>High standard construction of laboratories in Jiangsu Province</u>. With the goal of cultivating national laboratories, refer to the highest level both domestically and internationally...carry out interdisciplinary and collaborative innovation research with significant leading role, and strive to be included in the national strategic scientific and technological force layout.	High standard construction of laboratories	Laboratory instruments and equipment
2-2	Implement the <u>Global Talent Attraction and Gathering Plan</u>, establish a mechanism for releasing information on the demand for overseas high-end talents and establishing targeted contact and introduction mechanisms...build a group of overseas talent enclaves and make greater efforts to attract and gather outstanding talents from both domestic and foreign sources.	Talent attraction and gathering plan	Rewards for selected talents program
3-1	<u>Adhere to the implementation of a larger scope, wider scope, and deeper level of opening-up to the outside world</u>, with a focus on building a batch of high-quality Chinese-foreign education organizations...high-level international cooperative joint laboratories.	International exchanges and cooperation	Communication and training opportunities
3-2	<u>Promote the industrialization of innovative achievements</u>. Actively promoting the layout of key industrial chains in the industrialization center of technological innovation achievements of first-class universities at home and abroad...strengthen intellectual property protection and industrial application.	Industrialization of innovative achievements	Achievement transformation services
4-1	<u>Strengthen foreign cooperation and exchange</u>. Encourage economic development zones to actively integrate into the construction of the intersection of the "the Belt and Road" and the development of the Yangtze River Economic Belt...build a good platform for enterprises to "go global" and gather for development.	Foreign cooperation and exchange	Communication and training opportunities
4-2	Matters related to introducing foreign talents for innovation and entrepreneurship, <u>conducting international scientific and technological exchanges and cooperation</u>, etc	International exchanges and cooperation	Communication and training opportunities
5-1	<u>Implement the 10000 postdoctoral gathering plan.</u>	Postdoctoral agglomeration plan	Rewards for selected talents program
23-1	<u>Improve the science and technology reward system</u> in our province, and promote the standardized development of the province's science and technology reward system.	Science and technology reward system	Evaluation incentives

NOTES: 1-1Refers to the first initial code of the first policy text, and so on.

3.2. Axial coding

Spindle encoding is the process of re integrating categories to extract higher-level categories. Its main task is to discover and construct various connections between categories, including causal

relationships, temporal relationships, sequence relationships, situational relationships, similarity relationships, etc[4]. By repeatedly comparing and analyzing the categories formed by open coding, 15 subcategories were ultimately formed. The subcategories were further summarized, improved, and summarized, and then aggregated into six main categories (see Table 2).

Table 2: The main categories and subcategories formed by spindle encoding

Main categories	Subcategories	Open categories
Policy funding tilt	Talent subsidy	One position and one salary for scientific research funding, Research start-up funds, Personal income tax financial subsidy, Research funding support plan
	Rewards for selected talents program	Talent attraction and gathering plan, High level talent introduction plan
Talent cultivation	Postdoctoral site	Post-Doctoral research center、Postdoctoral innovation practice base
	Communication and training opportunities	International exchanges and cooperation, International scientific and technological exchange and cooperation, Foreign cooperation and exchange
Research conditions	Laboratory instruments and equipment	High standard construction of provincial laboratories, Research facility
	Research assistance personnel	Research assistant, Management assistant, Research support personnel
	Research service platform	High level technology innovation platform, Major innovation platforms, Data information platform
Achievement guarantee	Achievement transformation services	Industrialization of innovative achievements，Industrialization of achievement transformation
	Protection of property rights and patents	Intellectual property assessment, Allocation of technology transaction income
Living conditions guarantee	Placement of children and spouses	Enrollment of children, Spouse employment
	Settlement and housing subsidies	Housing subsidy, Rental subsidies, Public rental housing system, Settling-in allowance
	Medical convenience services	Regular free physical examination, Priority in consultation and treatment, Social medical security
Stimulating innovation vitality	Research atmosphere	Relaxed research atmosphere, Improving the research environment
	Research team	R&D team configuration, Talent information database
	Evaluation incentives	Establish a talent honor system, Policy service evaluation and incentive mechanism

3.3. Selective encoding

Selective encoding is a more focused process that involves further comparative analysis of various main categories. Its main task is to discover core categories with high correlation and abstraction levels from a large number of main categories. Around the core categories, other categories can be organically linked together. At the same time, the core categories will also serve as guidance for further data collection and theoretical sampling [5]. For this study, the core category is "building a highland for biomedical talents in Jiangsu Province", which consists of six main categories: policy funding tilt, talent cultivation, research conditions, research achievement guarantee, living conditions guarantee, and stimulating innovation vitality.

By further summarizing and refining the core category of "building a biomedical talent highland in Jiangsu Province", a storyline can be established between various main categories: measures

related to policy funding tilt and talent cultivation can be seen as helping to form a biomedical talent highland at the level of overall external social security; The guarantee of scientific research conditions and achievements is to provide driving force at the level of industrial technology; Ensuring living conditions and stimulating innovation vitality can be summarized as addressing the concerns of talent at the level of personal development and mobilizing their enthusiasm. We will work together from three levels to enhance the scale and quality of biomedical talents in Jiangsu Province, form a high potential talent area, and promote the formation of a highland for biomedical talents. Based on this, a key element model for building a biomedical talent highland can be constructed (see Figure 1).
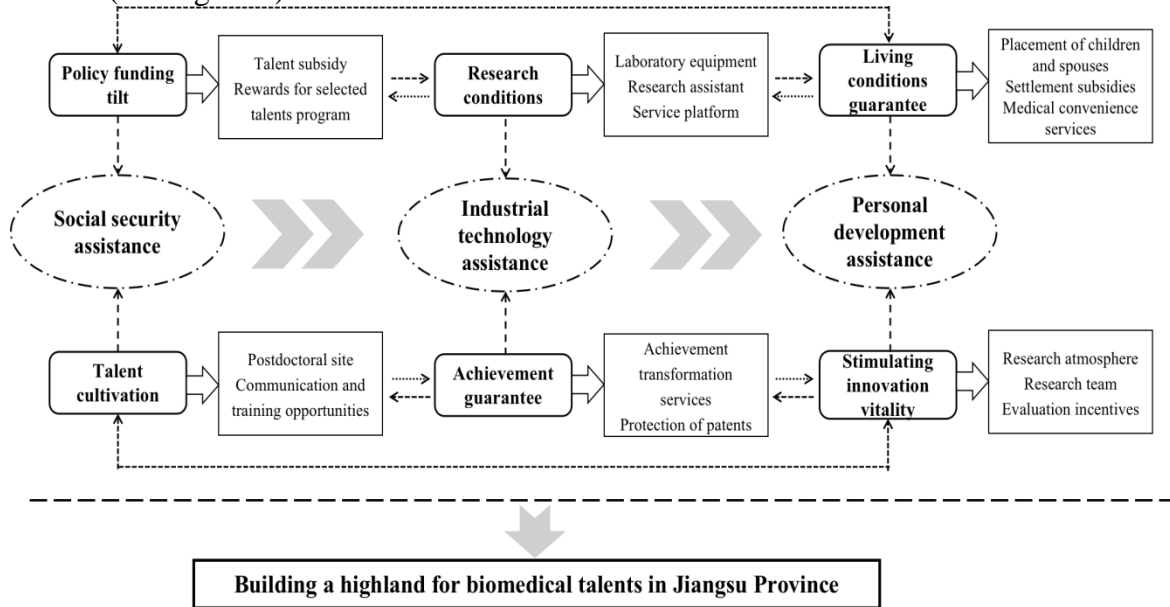

Figure 1: Key element model for building a biomedical talent highland in Jiangsu Province

3.4. Theoretical saturation test

When researchers are unable to obtain additional data to expand into new fields, we call it theoretical saturation. Glaser and Strauss use theoretical saturation as the identification criteria for stopping sampling[6]. After encoding 23 policy documents and 20 randomly selected literature, the remaining 13 literature were analyzed using the same encoding method. The research results showed that no new concepts or categories were found, and the interrelationships between each category did not show any new trends. Therefore, it can be concluded that the category encoding and theoretical model constructed in this study have reached theoretical saturation, Has strong explanatory power.

4. Conclusions

First, the research extracted the key elements of building a biomedical talent highland based on the biomedical talent literature review, policy text analysis and Grounded theory. The specific elements include policy funding tilt, talent cultivation, research conditions, guarantee of research achievements, guarantee of living conditions, and stimulation of innovation vitality.

Secondly, relevant countermeasures and suggestions are proposed for building a biomedical talent highland in Jiangsu Province, mainly including: firstly, building a fair and reasonable evaluation system for scientific and technological talents. We need to eliminate the concept of "paper first" and standardize the use of relevant indicators. The second is to improve individual

livelihood guarantee policies. The Provincial Department of Finance can implement preferential policies for biomedical talents, such as preferential policies for personal income tax reduction. For the relatively high personal income tax burden borne by the high-end talent group of biomedical high-level (top, leading, and high-end) talents, appropriate tax reduction or reduction of the collection ratio can be carried out based on tax preferential policies in Shanghai, Guangdong Hong Kong Macao Greater Bay Area, Hainan Free Trade Port, and other areas, Alternatively, flexible forms such as government financial subsidies can be used to expand the coverage of personal income tax preferential policies for high-level talent groups, enabling them to receive more policy dividends and stimulate talent innovation vitality. Thirdly, establish strategies based on different age groups and career development periods. Firstly, for young overseas talents in the early stages of career development, attention should be paid to creating a favorable growth environment and providing more development opportunities and platforms. Secondly, for overseas talents in the middle stage of career development, they should consider the needs of family life, pay attention to providing living security, solve the work problems of their families and the enrollment problems of their children, and lay a solid foundation. Finally, research backbone and leading talents in a stable period of career development focus on improving the working conditions and environment for scientific research.

References

[1] Jia Zhemin. Application of Grounded theory in public management research: methods and practice [J]. China Administration, 2015 (03): 90-95.

[2] Li Tuoyu, Deng Yongxin, Ye Min. Construction of innovative talent training mode for new research and development institutions - research based on Grounded theory method [J]. Research on Higher Engineering Education, 2023, No.199 (02): 70-74.

[3] Ma Teng, Zhao Shukuan. Evaluation and Analysis of University Scientific Research Talents' Ability Based on Grounded theory [J]. Science and Technology Progress and Countermeasures, 2022,39 (21): 143-150.

[4] Chen Xiangming. Qualitative Research Methods and Social Science Research [M]. Beijing: Education Science Press, 2000:333-334.

[5] Glaser, B. G. Theoretical Sensitivity[M]. Mill Valley, CA: Sociology Press, 1978:61.

[6] Fei Xiaodong. Research methodology of Grounded theory: elements, research procedures and evaluation criteria [J]. Public Administration Review, 2008, 1 (03): 23-43.