

# Empirical Study on the Operational Status and Key Influencing Factors of Outpatient Multidisciplinary (MDT) Service Model: A Cross-Sectional Study in Sichuan Province, China

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**Background:** Currently, there is a lack of baseline research on outpatient Multi-Disciplinary Team (MDT) services. Through conducting a cross-sectional survey in Sichuan Province, China, this study aims to explore the current status and influencing factors of outpatient MDT services, providing a reference for their further development.

**Methods:** A questionnaire survey was conducted in June 2024 on tertiary medical institutions in Sichuan Province using the cluster sampling method. A total of 203 valid questionnaires were collected, yielding an effective response rate of 91.0%. Descriptive statistics, correlation, and difference tests were employed to analyze the survey data.

**Results:** The development rate of outpatient MDT in tertiary medical institutions in Sichuan Province was 77.3%, and the start-up time was mainly concentrated in the past five years. About 87.3% of the hospitals set up fixed MDT teams with the number of  $\leq 10$ , which was still in the development stage. In terms of MDT organization and management, 96.8% of the hospitals have issued relevant management systems, but the cognitive differences of MDT function positioning lead to significant heterogeneity in organization and management and operation mode. The analysis of key influencing factors shows that team dynamics is the primary internal driving factor, while medical insurance policy is the primary external influencing factor.

**Conclusion:** Medical institutions need to promote the standardized development of outpatient MDT from the two dimensions of system construction and mechanism innovation: first, improve the institutionalized management framework: integrate the core link of MDT into the hospital quality management system through the construction of standardized workflow. Second, establish a refined assessment mechanism: focus on process indicators such as the standardized rate of case discussion and the implementation rate of the scheme, support an interdisciplinary performance incentive system, and mobilize the enthusiasm of departments and doctors to promote their rapid development.

**Keywords:** multi-disciplinary team, outpatient MDT, current situation survey, influence factor

## Introduction

With the evolution of the medical model and the increasing demand for individualized patient care, the multi-disciplinary team (MDT) model has emerged as a crucial component in the modern healthcare system.<sup>1,2</sup> By harnessing the specialized knowledge and skills of various disciplines, the MDT model offers patients a holistic and tailored diagnosis and treatment plan, thereby enhancing diagnostic and treatment efficiency, improving patient prognosis, and boosting patient satisfaction.<sup>3</sup> The concept of MDT mode originated from the pilot of diagnosis and treatment of difficult and difficult diseases in children in the 1960s. Early practice emphasized the importance of multidisciplinary cooperation.<sup>4,5</sup> Since then, European and American countries have taken the lead in promoting the MDT model in the field of cancer. In 1993, the United Kingdom incorporated the MDT model into the community health care system.<sup>6</sup> In 1997, the International Working Group on Colorectal Cancer (IWGCRC) clearly recommended the MDT model and stipulated

the composition of MDT members.<sup>7</sup> In 2007, the United Kingdom passed the National Health Service System (NHS) tumor diagnosis and treatment specification legislation, which stipulates that all tumor patients must go through MDT discussion, laying the core position of MDT in tumor diagnosis and treatment.<sup>8</sup> In 2013, the European Union listed MDT as the key link of cancer treatment through the policy statement of the European cooperation for action against cancer (EPAAC).<sup>9,10</sup> At present, European and American countries have successively established localized MDT implementation systems, and gradually formed a whole process management mode covering pre-diagnosis evaluation, clinical decision-making and postoperative follow-up.<sup>11–13</sup>

Compared with developed countries in Europe and the United States, China's adoption of MDT model started relatively late. In 2010, the former Ministry of Health of China introduced the MDT model in the Code for «Diagnosis and Treatment of Colorectal Cancer (2010 Edition)». <sup>14</sup> Thanks to policy guidance and innovative exploration by medical institutions, three types of MDT models have gradually emerged: outpatient, inpatient, and remote MDT. The outpatient MDT is a team composed of relatively fixed experts from at least three related disciplines. For a certain disease with complex condition, multidisciplinary expert discussions are held at regular intervals and locations in the outpatient department to formulate the best diagnosis and treatment scheme for patients. In the context of China's national conditions, outpatient MDT, as a new diagnosis and treatment model, has been widely promoted and rapidly developed in large domestic hospitals.<sup>15,16</sup> However, owing to the vast territory and the varying economic and cultural landscapes across different regions, as well as significant disparities in medical development levels, outpatient MDT currently lacks a unified standard in areas such as team construction, operational models, process management, and quality control. This has led to uneven development, impeding the promotion of outpatient MDT.<sup>14,17</sup>

Guided by the needs of industry development, the research team conducted a baseline survey on the current implementation status of outpatient multidisciplinary team (MDT) clinics in tertiary public hospitals in Sichuan Province. Through in-depth mining and analysis of the survey data, this study aims to understand the implementation status of tertiary public hospitals in western China, identify key issues and core needs in outpatient MDT practices, and explore internal and external influencing factors affecting the development of outpatient MDT. The findings are expected to provide references for the further promotion and standardization of the outpatient MDT model.

## Methods

### Research Object

The respondents were managers of outpatient departments of tertiary public medical institutions from 18 prefecture level cities and 3 autonomous prefectures in Sichuan Province.

### Investigation Methods

On the basis of consulting a large number of literatures, combined with the actual operation characteristics of outpatient MDT work, the researchers designed a questionnaire under the guidance of experts. The questionnaire covers five dimensions, including the basic situation of medical institutions, the current situation of outpatient MDT, organization and management, quality control and internal and external factors affecting the development of MDT, with a total of 42 items. In terms of sampling method, the research team determined that the minimum sample size to meet the requirements of statistical analysis was 168 based on the total number of tertiary public hospitals in Sichuan Province in 2021 ( $n = 299$ ) in the 2022 China Health Statistical Yearbook, using the stratified sampling sample size calculation formula. In view of the homogeneity of the three-level hospital management system, the study adopted the cluster sampling method. With the strong support of Sichuan outpatient management medical quality control center, the questionnaire was distributed to the three-level public medical institutions in the province in the form of electronic questionnaire (questionnaire star) on June 27, 2024. Strict quality control is implemented in this survey: the director of the outpatient department is limited to be the only person responsible for filling in and submitting only one questionnaire in each institution to ensure the professionalism and uniqueness of the data source.

## Statistical Methods

IBM SPSS 25.0 software was used to establish the database and analyze the survey data. Qualitative data such as the basic situation, development status and organization management of medical institutions were analyzed by descriptive statistics, expressed in frequency and percentage. The influencing factors of outpatient MDT were analyzed using chi-square test and Mann–Whitney *U*-test for univariate correlation analysis. The comparative analysis of internal and external influencing factors scores of MDT between grade III grade A hospitals and grade B hospitals was conducted by Mann Whitney *U*-test of independent samples.  $P < 0.05$  means statistically significant.

## Results

### Reliability and Validity Analysis

This study employed Cronbach's alpha coefficient to assess the reliability of the questionnaire. The results indicated that Cronbach's alpha was 0.891, exceeding the threshold of 0.70, thus demonstrating high internal consistency and good reliability of the questionnaire. To validate the structural validity of the questionnaire, we utilized the KMO (Kaiser-Meyer-Olkin) measure and the Bartlett's test of sphericity. The KMO value of 0.852 signifies that the questionnaire data is suitable for factor analysis. Additionally, the P-value from Bartlett's test of sphericity was less than 0.05, indicating statistical significance, further affirming the good structural validity of the questionnaire data.

### Basic Information of Medical Institutions

A total of 223 questionnaires were collected in this survey, of which 203 were valid, resulting in an effective response rate of 91.0%. According to descriptive statistical analysis, there are 108 tertiary Grade III Class A hospitals (53.2%) and 95 tertiary Grade III Class B hospitals (46.8%). The types of hospitals include 138 comprehensive hospitals (68.0%), 29 specialist hospitals (14.3%), and 36 traditional Chinese medicine hospitals (17.7%). There are 11 hospitals with annual outpatient volume of less than 100,000 (5.4%) person-times, 106 hospitals with 100,000 to 500,000 (52.2%) person-times, 53 hospitals with 500,000 to 1 million (26.1%) person-times, and 33 hospitals with over 1 million (16.3%) person-times. There are 8 hospitals with annual discharge of less than 5,000 patients (3.9%) person-times, 18 hospitals with 5,000 to 10,000 patients (8.9%) person-times, 128 hospitals with 10,000 to 50,000 patients (63.1%) person-times, and 49 hospitals with over 50,000 patients (24.1%) person-times.

### Current Status of Outpatient MDT Operations

Out of 203 hospitals, 157 have implemented outpatient MDT, with an implementation rate of 77.3%. Among them, 114 (72.6%) hospitals have designated personnel for managing outpatient MDT, and 135 (86.0%) hospitals have established dedicated MDT consultation rooms for this purpose. The statistical analysis reveals a significant correlation between the implementation of outpatient MDT services and factors such as hospital level, hospital type, average annual outpatient volume, and average annual discharge volume, with a P-value of less than 0.001 (For further details, please refer to Table 1).

The forms of outpatient MDT, ranked from most common to least common, are: offline MDT meetings (98.7%), remote collaboration MDT between medical institutions (21.0%), internet hospital online MDT (12.1%), and others (7%). Other forms of implementation include the MDT discussion format that combines online and offline methods. This format involves some experts offline and some online, utilizing remote application systems to conduct interdisciplinary discussions across time and space, and develop diagnosis and treatment plans for patients. Among the 157 hospitals that have carried out outpatient MDT, 58 (36.9%) implement the three fixed modes of MDT (fixed personnel, time, and location), while 30 (19.1%) hospitals do not have fixed personnel, time, and location for MDT operation. They mainly form expert teams and arrange interdisciplinary discussions on a temporary basis to meet the personalized diagnosis and treatment needs of patients. There are various ways to make appointments for outpatient MDT, and the proportion of appointment methods from high to low is doctor recommendation (77.7%), on-site review application (74.5%), online appointment for patients (36.9%), and out of hospital referral (18.5%).

**Table 1** Correlation Analysis of Outpatient MDT Service Implementation

Variable	Category	N (%)	Statistical Test	Statistic	*P*
Hospital level	Grade III Class B	95(46.8%)	Chi-square	$\chi^2 = 17.6$	<0.001
	Grade III Class A	108(53.2%)			
Types of hospitals	Comprehensive hospitals	138(68.0%)	Mann–Whitney U	U = 2396.5	<0.001
	Specialist hospitals	29(14.3%)			
	Traditional Chinese medicine hospitals	36(17.7%)			
Annual outpatient volume (person-times)	<100,000	11(5.4%)		U = 2321.0	<0.001
	100,000 to 500,000	106(52.2%)			
	500,000 to 1 million	53(26.1%)			
	>1 million	33(16.3%)			
Annual discharge volume (person-times)	<500,000	8(3.9%)		U = 2427.5	<0.001
	500,000 to 1 million	18(8.9%)			
	1 million to 5 million	128(63.1%)			
	>5 million	49(24.1%)			

About 87.3% of the hospitals had less than 10 outpatient MDT categories, and 89.1% of the hospitals had an average monthly MDT service volume of 50 people or less. Among the 157 hospitals that have implemented outpatient MDT, 14 (8.9%) have established MDT for rare diseases. The five most commonly developed rare disease MDT categories are neuroendocrine tumors, amyloidosis, neurofibroma, retinoblastoma, and hypertrophic cardiomyopathy.

In terms of information construction, 36 (22.9%) hospitals have specialized information system support work, of which 33 (21.0%) hospitals have built standardized MDT database to manage patients (see Table 2 for details).

**Table 2** Outpatient MDT Operation Status (N = 203)

Variables	n	%
Whether to provide outpatient MDT services		
Yes	157	77.3
No	46	22.7
Year of conducting outpatient MDT work		
2013 and earlier	4	2.6
2013-2016	8	5.1
2017-2020	47	29.9
2021-2024	98	62.4
Whether there is dedicated personnel for MDT management		
Yes	114	72.6
No	43	27.4
Is there a dedicated MDT consultation room		
Yes	135	86.0
No	22	14.0
The form of outpatient MDT is (Multiple choice questions)		
Offline outpatient MDT	155	98.7
Internet hospital online MDT	19	12.1
Remote collaboration MDT between medical institutions	33	21.0
Others	7	4.5

(Continued)

**Table 2** (Continued).

Variables	n	%
Outpatient MDT visit mode (Multiple choice questions)		
Fixed personnel	76	48.4
Fixed time	74	47.1
Fixed location	114	72.6
Temporary personnel arrangement	97	61.8
Temporary arrangement of time	83	52.9
Temporary arrangement of location	34	21.7
Outpatient MDT appointment method (Multiple choice questions)		
Doctor recommendation	122	77.7
On-site audit application	117	74.5
Online appointment for patients	58	36.9
Out-of-hospital referral	29	18.5
The number of types of outpatient MDT services that have been established.		
10 or less	137	87.3
11-40 pieces	16	10.2
41-70 pieces	1	0.6
71 or more	3	1.9
Monthly average service volume of outpatient MDT		
50 persons or less	140	89.2
51-100 persons	9	5.7
101-300 persons	6	3.8
300 or more persons	2	1.3
Does the established outpatient MDT cover rare MDT diseases*?		
Yes	14	8.9
No	143	91.1
Is there a dedicated information system to support the work		
Yes	36	22.9
No	121	77.1
Is there a standardized MDT database established		
Yes	33	21.0
No	124	79.0
Is there a clear fee standard for outpatient MDT services		
Yes	88	56.1
No	69	43.9
The fee standard (in RMB) for outpatient MDT is		
400 or less RMB	56	63.6
401–600 RMB	32	36.4

**Notes:** \*According to Chinese national regulations, rare diseases are defined as conditions that simultaneously meet three core criteria: a neonatal incidence rate of less than 1 in 10,000, a prevalence rate of less than 1 in 10,000, and a total national patient population of fewer than 140,000 for a single disease.<sup>18</sup>

In terms of charging standards, currently outpatient MDT in Sichuan Province has not been included in medical insurance reimbursement. About 88 (56.1%) of the government departments in the urban areas where hospitals are located have issued clear outpatient MDT charging standards. Out of 88 hospitals, 56 (63.6%) have a charging standard of 400 RMB or less per patient visit, while 32 (36.4%) have a charging standard of 401–600 RMB per patient visit.

## Outpatient MDT Organizational Management

The survey results showed that 152 (96.8%) hospitals had a clear outpatient MDT system, 111 (70.7%) hospitals had a standard approval process for the establishment of outpatient MDT, 121 (77.1%) hospitals required at least three or more

departments to form an MDT team, while 36 (22.9%) hospitals formed an MDT team on demand, without the requirement of the number of departments.

In terms of personnel management, regarding the qualification requirements for MDT team leaders: 79.7% of hospitals demand that the MDT leader should hold the qualification of Senior Registrar; 14.0% of hospitals require the MDT leader to have at least 5 years of experience as a Registrar; 6.4% of hospitals have no specific requirements. As for the qualification criteria for MDT team participating experts: 52.2% of hospitals insist that MDT participating experts must meet the criteria of Senior Registrar; 40.1% of hospitals demand that participating experts have at least 5 years of experience as a Registrar; 7.7% of hospitals have no such requirements. Furthermore, 75.2% of hospitals' MDT teams are supported by dedicated secretaries to assist with team work, and 88.5% of hospitals provide training for MDT team members.

In terms of operation and management, 61 hospitals (38.9%) have established inclusion criteria for MDT team discussions, while 96 hospitals (61.2%) lack specific inclusion criteria. It is up to the MDT team experts to review and decide whether patients require an MDT discussion. Among the 157 hospitals that have implemented outpatient MDT, 70.1% assess doctors' visits to the MDT clinic through the following methods: manual check-in (63.1%) and system check-in (7.0%). Additionally, 94 hospitals (59.9%) currently utilize MDT electronic medical records and 134 hospitals (85.4%) conduct follow-up management for patients after diagnosis (See [Table 3](#) for details).

**Table 3** Outpatient MDT Quality Management

Variable	N	%
Is there a clearly established outpatient MDT system in place?		
Yes	152	96.8
No	5	3.2
Is there a standard approval process for the establishment of outpatient MDT?		
Yes	111	70.7
No	46	29.3
Requirements for the number of departments to be established by the outpatient MDT team?		
At least 3 or more	121	77.1
Formed as needed, no specific number required	36	22.9
The qualification requirements for the head of the outpatient MDT team		
Senior Registrar	125	79.6
At least 5 years of experience as a Registrar	22	14.0
No standard	10	6.4
The qualification requirements for experts participating in the outpatient MDT team		
Senior Registrar	82	52.2
At least 5 years of experience as a Registrar	63	40.1
No standard	12	7.7
Is the MDT team provided with a dedicated secretary?		
Yes	118	75.2
No	39	24.8
Whether corresponding training is provided to MDT team members?		
Yes	139	88.5
No	18	11.5
Does each MDT team have clear inclusion criteria for discussing case discussions?		
Yes	61	38.8
No, it will be reviewed and decided by MDT experts.	96	61.2
What is the check on work attendance method for MDT outpatient doctors?		
Manual check-in	99	63.1
System check-in	11	7.0
No assessment	47	29.9

(Continued)

**Table 3** (Continued).

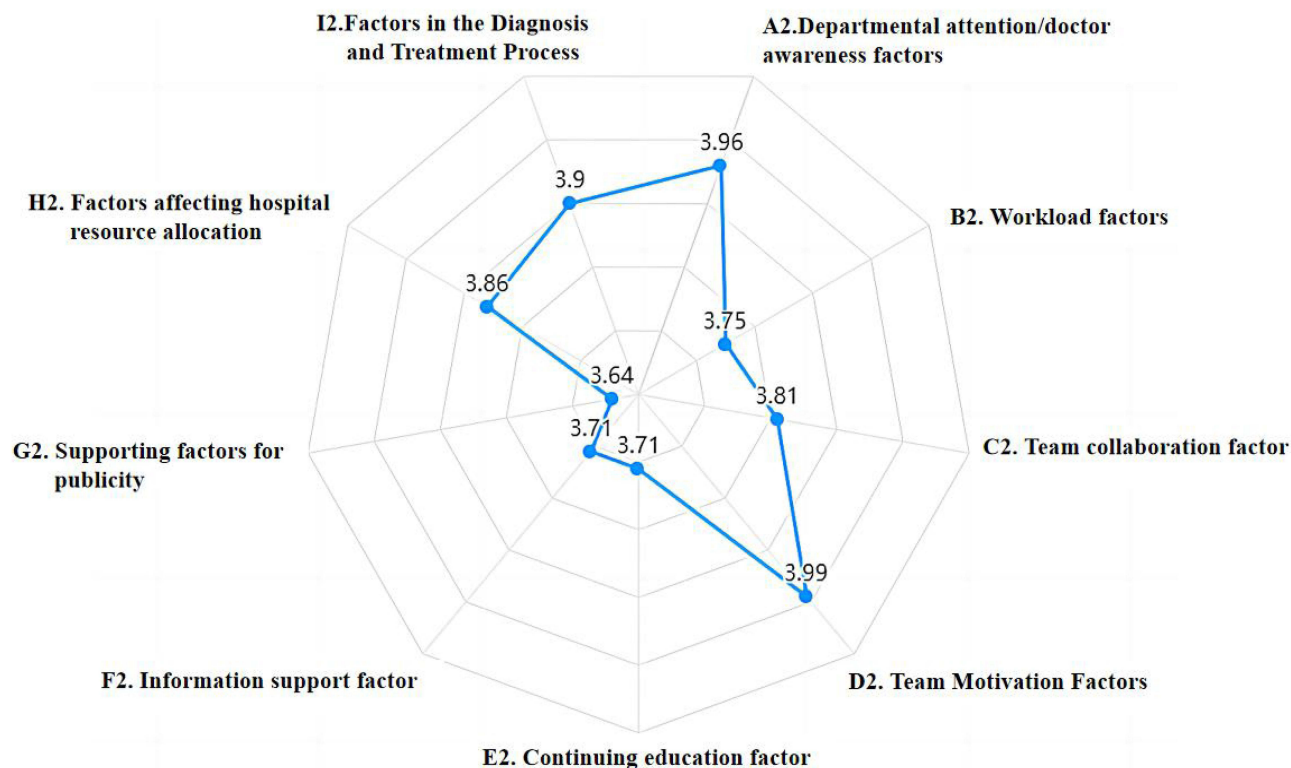
Variable	N	%
Has MDT electronic medical record been adopted?		
Yes	94	59.8
No	63	40.2
Is follow-up conducted for patients after consultation?		
Yes	134	85.4
No	23	14.6

In terms of performance management and incentive mechanisms, among the 157 hospitals that have implemented outpatient MDT, 56 (35.7%) have incorporated the workload of outpatient MDT into the performance evaluation of participating departments, while 25 (15.9%) have included it in the performance evaluation of participating doctors.

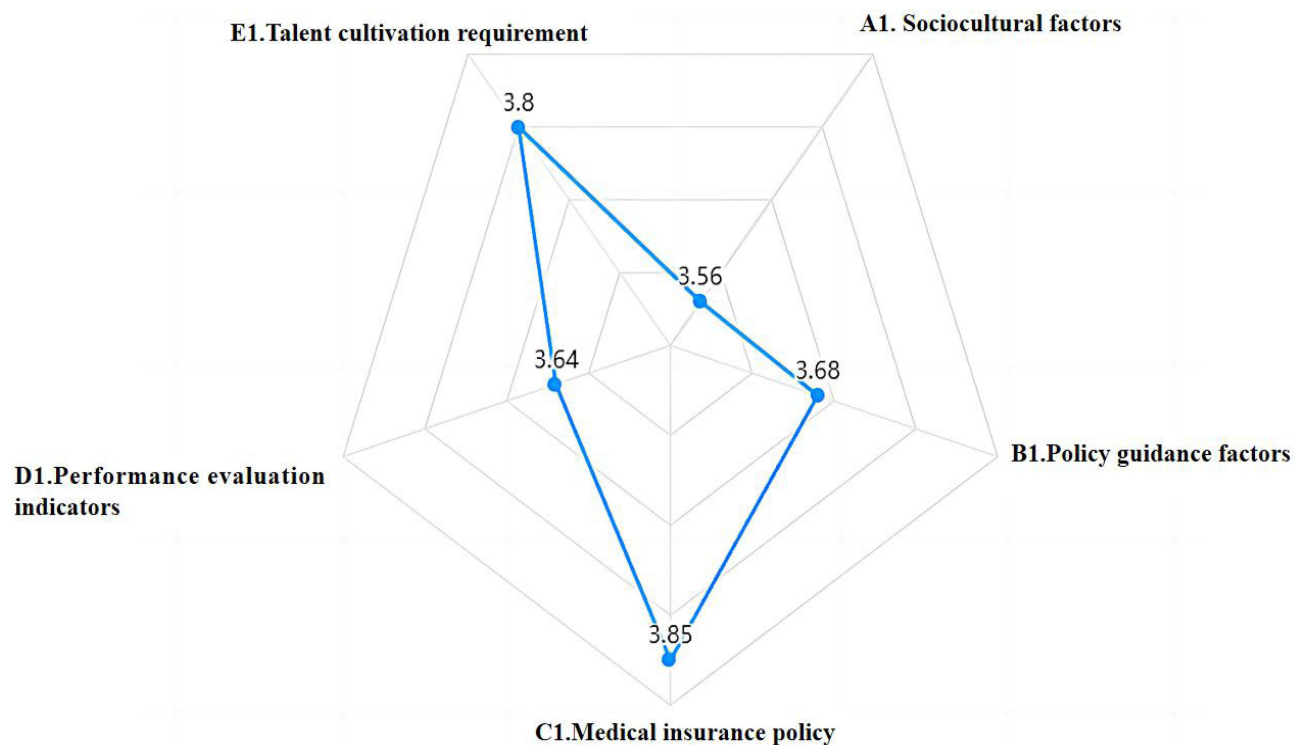
### Internal and External Influencing Factors of Outpatient MDT Development

To further analyze the internal and external factors influencing the development of outpatient MDT, the research team adopted the Likert 5-point scale, with the outpatient department managers rating the influencing factors on a scale of 1 to 5. The survey results revealed that the most significant internal factor affecting outpatient MDT was “team dynamics: effective MDT assessment and incentive mechanisms” (mean = 3.99), while the foremost external factor was “medical insurance policy: clear charging standards and policy support” (mean = 3.85) (Refer to [Figures 1](#) and [2](#) for details).

To analyze and compare the differences in the scores of influencing factors for MDT development between Grade III Class A hospitals and Grade III Class B hospitals, the research team categorized the data into these two groups to assess disparities between hospitals of different levels. The statistical results indicated that hospitals of different levels exhibited differences in various internal and external sub-factors influencing the development of outpatient MDT. Among these, the



**Figure 1** Radar chart of internal influencing factors in outpatient MDT.



**Figure 2** Radar chart of external influencing factors for outpatient MDT.

sub-factor with the greatest difference in external factors was “health insurance policy support” (Cohen’s  $d = 0.741$ ), while the sub-factor with the most significant difference in internal factors was “diagnosis and treatment process” (Cohen’s  $d = 0.6$ ). Please refer to [Table 4](#) for further details.

**Table 4** Analysis of Differences in the Scores of Factors Affecting MDT Development Between Grade III Class A and Grade III Class B Hospitals

Variable	Sub Variable Name	Variable Value	Sample Size	Median	Standard Deviation	Statistic	*P*	Median Value Difference	Cohen's d Value
XI External influencing factors	A I. Sociocultural factors: patients' perception of MDT	Class A	96	4	1.199	3824.5	0.001***	1	0.611
		Class B	61	3	1.504				
		Total	157	4	1.379				
	B I. Policy guidance factors: national level standardized guidance for MDT operation and quality management	Class A	96	4	1.111	3720	0.003***	1	0.512
		Class B	61	3	1.285				
		Total	157	4	1.214				
	C I. Medical insurance policy: clear fee standards, supported by medical insurance policies	Class A	96	5	1.032	3981.5	0.000***	1	0.741
		Class B	61	4	1.465				
		Total	157	4	1.292				

(Continued)

Table 4 (Continued).

Variable	Sub Variable Name	Variable Value	Sample Size	Median	Standard Deviation	Statistic	*P*	Median Value Difference	Cohen's d Value
	D1. Performance evaluation indicators: formulating performance evaluation indicators and incentive policies at the national level	Class A	96	4	1.225	3774	0.002***	1	0.551
		Class B	61	3	1.47				
		Total	157	4	1.368				
	E1. Talent cultivation requirement: to foster medical students' awareness and ability for multidisciplinary diagnosis and treatment	Class A	96	4	1.074	3753.5	0.002***	0	0.568
		Class B	61	4	1.392				
		Total	157	4	1.249				
X2 Internal influencing factors	A2. Departmental attention/doctor awareness factors: the level of attention and participation enthusiasm of departments and doctors	Class A	96	5	1.045	3640.5	0.006***	1	0.522
		Class B	61	4	1.443				
		Total	157	4	1.25				
	B2. Workload factors: the rationality of clinical doctors' work schedule encompassing medical, teaching, research, and administrative tasks	Class A	96	4	1.086	3731.5	0.003***	0	0.519
		Class B	61	4	1.267				
		Total	157	4	1.192				
	C2. Team collaboration factor: the roles and responsibilities of MDT team members are clearly defined	Class A	96	4	0.995	3614	0.010**	0	0.489
		Class B	61	4	1.286				
		Total	157	4	1.144				
	D2. Team Motivation Factors: Effective MDT Assessment and Incentive Mechanisms	Class A	96	4	0.969	3376.5	0.088*	0	0.349
		Class B	61	4	1.26				
		Total	157	4	1.104				
	E2. Continuing education factor: the intensity of training for doctors' MDT-related abilities	Class A	96	4	1.078	3500	0.033**	0	0.368
		Class B	61	4	1.205				
		Total	157	4	1.144				
	F2. Information support factor: the level of support provided by the information platform	Class A	96	4	1.119	3720.5	0.003***	0	0.561
		Class B	61	4	1.473				
		Total	157	4	1.311				
	G2. Supporting factors for publicity: MDT's promotional efforts	Class A	96	4	1.128	3774	0.002***	1	0.545
		Class B	61	3	1.287				
		Total	157	4	1.23				
	H2. Factors affecting hospital resource allocation: scientific and rational performance allocation of departments and doctors	Class A	96	4	0.976	3524	0.024**	0	0.476
		Class B	61	4	1.386				
		Total	157	4	1.179				
I2. Factors in the Diagnosis and Treatment Process: standardization and convenience of the MDT diagnosis and treatment process	Class A	96	4	0.91	3694.5	0.004***	0	0.6	
	Class B	61	4	1.362					
	Total	157	4	1.15					

Notes: \*\*\*P < 0.01, \*\*P < 0.05, \*P < 0.1, respectively.

## Discussion

The survey results show that the development rate of outpatient MDT in tertiary medical institutions in Sichuan Province is 77.3%, and the development time is mainly concentrated in the past five years. About 87.3% of hospitals have fixed MDT teams  $\leq 10$ , reflecting that they are still in the primary stage of development. Compared with European and American countries, the German Cancer Center certification requires that the MDT case coverage rate be  $\geq 90\%$ ,<sup>19</sup> while the National Health Service (NHS) in the UK requires all cancer patients to accept MDT through legislation, and the MDT participation is included in the core index of hospital evaluation.<sup>20,21</sup> Whether the government puts forward mandatory requirements for MDT coverage may be one of the institutional factors affecting development.

In terms of the organization and management of MDT, 96.8% of the hospitals have issued relevant management systems, but they have different understanding of the concept and functional orientation of MDT, and there are great differences in the form of development and outpatient mode. For example, with regard to the outpatient MDT model, although the National Health Commission of China issued the Interim Provisions on outpatient quality management in medical institutions in June 2022, which proposed that “the outpatient MDT should be provided with multidisciplinary medical services by a relatively fixed expert team at a fixed time and place”, that is, the “three fixed” outpatient model. The survey results show that the current outpatient MDT implementation rate of the “three fixed” visiting mode is relatively low, only 36.9% of the hospitals implement it, and some hospitals still stay in the traditional consulting mode, that is, temporarily initiate the consultation, temporarily establish the expert team, and arrange the consultation time. Due to the lack of fixed team cooperation, it may lead to the lack of multi-disciplinary cooperation, and it is difficult to reach a consensus. Compared with European and American countries, the UK National Health Service (NHS) ensures service consistency through standardized MDT processes (such as weekly fixed meetings and electronic case sharing),<sup>22,23</sup> while Germany requires that MDT meetings must be regularly attended by core specialists.<sup>19</sup> This shows the importance of standardized management of MDT operation.

In terms of hospital internal management mechanism, only 35.7% of hospitals included MDT in department assessment, and 15.9% included physician performance. This shows that most hospitals generally ignore the incentive mechanism construction closely related to the personal interests of departments and doctors when promoting the implementation of MDT. The study found that “team dynamics factor” was the largest internal factor affecting the development of outpatient MDT, which also confirmed that medical institutions should promote the sustainable development of MDT through system design (assessment and performance), cognitive improvement and management tool innovation. The survey shows that “medical insurance policy” is the primary external factor affecting the development of outpatient MDT, which is consistent with international experience. For example, Germany included MDT in the DRG payment system and compensated according to the case weight; The national health service system (NHS) in the UK has set up a special package charge for MDT to encourage departments to continue to participate.<sup>24,25</sup> Therefore, clarifying and standardizing the MDT charging standard is the core measure to promote its development, which should be the key development direction in the future.

The outpatient MDT model is still in the stage of continuous development in China. Our research method has limitations in using cross-sectional survey research. It is necessary to comprehensively and objectively reflect the overall development status of outpatient MDT in medical institutions in China. In the future, we will conduct cluster stratified sampling research and analysis on tertiary hospitals in China, so as to provide reference for further promotion and development of outpatient MDT model.

## Conclusion

This study, conducted through a survey of tertiary medical institutions in Sichuan Province, revealed that outpatient MDT services currently lack a unified standard in crucial aspects, including organizational structure, personnel qualifications, operational modes, and service procedures. It is advisable for medical institutions to enhance the institutional management of outpatient MDT, establish clear and standardized workflows, devise scientific and effective evaluation mechanisms, and integrate core aspects of outpatient MDT into the hospital's quality management system, encompassing indicators such as the standardization rate of MDT case discussions and project implementation rates. Additionally,

medical institutions should offer corresponding performance incentive schemes to motivate doctors' participation, thereby fostering the continuous optimization and refinement of outpatient MDT services.

## Data Sharing Statement

Results data are available upon request to the corresponding author.

## Ethical Approval

This study has been approved by the Biomedical Ethics Review Committee of West China Hospital, Sichuan University.

## Acknowledgments

This study received substantial support from the Sichuan Medical and Health Quality Control Center, enabling the successful completion of the research task.

## Author Contributions

All authors made a significant contribution to the work reported, whether that is in the conception, study design, execution, acquisition of data, analyses and interpretation, or in all these areas, took part in drafting, revising or critically reviewing the article, gave final approval of the version to be published; have agreed on the journal to which the article has been submitted; and agree to be accountable for all aspects of the work.

## Funding

National Natural Science Foundation of China (NSFC): 72374148, Science/Technology Project of Sichuan province: 2024YFFK0061 and 1·3·5 Projects for Artificial Intelligence (ZYAI24015): West China Hospital, Sichuan University.

## Disclosure

The authors reports no conflicts of interest in this work.

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