Journal of Multidisciplinary Healthcare

Dovepress
open access to scientific and medical research

Open Access Full Text Article

ORIGINAL RESEARCH

Participation in Multidisciplinary Teams Among Healthcare Professionals: A Discrete Choice Experiment in Tertiary Public Hospitals in China

Jie Jia[1,*], Tao Sun[1,*], Jiamin Tang[1], Kaidi Sun[1], Zhengnan Meng[1], Hailong Zhu[2], Xianhong Huang[1]

[1]Department of Health Policy and Management, School of Public Health, Hangzhou Normal University, Hangzhou, 311121, People's Republic of China; [2]Department of Sociology, School of Public Administration, Hangzhou Normal University, Hangzhou, 311121, People's Republic of China

*These authors contributed equally to this work

Correspondence: Xianhong Huang, Department of Health Policy and Management, School of Public Health, Hangzhou Normal University, Hangzhou, 311121, People's Republic of China, Tel/Fax +86-571-2886-5627, Email hxh974291@163.com

Purpose: Healthcare professionals' participation is crucial for the efficient implementation of multidisciplinary team (MDT) collaboration models. We identified the key factors influencing healthcare professionals' preference to participate in MDTs in tertiary hospitals.

Methods: To clarify the attributes and levels of the discrete choice experiment (DCE), we conducted a targeted literature review and conducted in-depth interviews with MDT service providers. Following this, a DCE was designed to evaluate healthcare professionals' preferences for MDT participation, and the influence of factors such as salary subsidies, leadership attention, patient participation, quality assessment, working intensity, and case complexity. A conditional logit model estimated the utility of each attribute. Willingness-to-pay estimates were derived by taking the negative ratio of the coefficients of non-economic and economic attributes. A series of policy simulation analyses were conducted.

Results: Two hundred healthcare professionals completed the questionnaire, with 180 valid responses used for analysis. All attributes were statistically significant. Leadership attention and working intensity were the primary factors influencing staff willingness to participate in MDTs, followed by quality assessment and salary subsidies. Significant preference differences were observed between respondents; compared with mid-level staff, senior-level healthcare professionals believed patient engagement would be more helpful in boosting participation. The policy simulation showed that changing leadership attention from "neglect" to "emphasis" would increase the probability of staff choosing to participate in MDTs from 24.4% to 66.98%.

Conclusion: Leadership attention was the primary concern for healthcare professionals in MDTs. To effectively motivate staff participation in MDTs, policymakers should adopt a holistic approach that considers work motivation and individual backgrounds, including competitive salary packages and a positive work environment. They should concurrently introduce MDT case complexity measurement tools to optimize resource allocation. Addressing staff members' unique needs and career aspirations by creating targeted training programs, pathways for advancement, and personalized career development plans are also crucial.

Keywords: multidisciplinary medical services, participation motivation, health services research, discrete choice experiment

Introduction

Owing to the rapid growth of medical knowledge and specialization in medical practice, patients facing complex disease diagnoses and treatment often need to consult multiple specialists, which can lead to delays in treatment and reduce patient satisfaction.[1] In response to this challenge, the multidisciplinary team (MDT) collaboration model has been widely adopted and promoted globally.[2] MDT collaboration refers to providing patients with one-stop comprehensive medical services centered on patient needs through the joint participation of interdisciplinary professionals, implemented via regular case discussion meetings.[3] In China, the application of MDT collaboration has expanded from tumor treatment to high-difficulty diseases in various departments of comprehensive hospitals, becoming a core component

Received: 24 April 2024
Accepted: 4 September 2024
Published: 7 September 2024

of medical quality and safety.[4] Standardizing the multidisciplinary development process and implementing high-quality multidisciplinary development has become a top priority in the construction of tertiary hospitals.

Effective MDT collaboration has been proven to result in more comprehensive and safer treatment plans, 83% of which are implemented, thus ensuring the safety of patient care.[5] Concurrently, MDT was able to optimize the quality of survival and outcomes of patients with lung cancer by enabling a 33% higher five-year survival rate compared to patients receiving traditional care approaches,[6] and it increased patient satisfaction to 83%.[7] Additionally; this model helps strengthen healthcare professionals' teamwork capabilities, facilitates their professional growth, and enhances team cohesion,[8] thereby achieving win-win outcomes for both patients and providers.

Although the theoretical benefits of MDT collaboration have been widely recognized, its application and sustainability in clinical practice have yet to reach the expected levels.[9] A survey conducted among members of the Australian Lung Cancer Committee revealed that over 20% of healthcare professionals' participation in MDT meetings required skill improvement.[10] A similar issue was observed in China, where a study of tertiary hospitals in Anhui Province indicated that the participation rate of healthcare professionals in MDTs was only 19.2%.[11] A survey conducted in tertiary hospitals in Southwestern China revealed that healthcare professionals' willingness to participate in MDT collaboration was 63.2%.[4] The low participation of healthcare professionals in MDTs has proven to be a considerable obstacle for clinical decision-making, which in turn leads to inefficiencies.[12] Therefore, to truly leverage the advantages of MDTs, it is imperative to analyze the preferences of healthcare professionals regarding their participation in MDT collaborations.

However, stimulating sustained enthusiasm among healthcare professionals to participate in MDTs is not an easy task. Currently, the number of cases discussed in MDT meetings is increasing dramatically, putting immense time pressure on healthcare professionals.[13] For instance, it is estimated that over one million person-hours are dedicated to attending meetings in the UK annually. Specifically, radiologists spend 2 hours, while pathologists spend 2.4 hours preparing for each hour of a team meeting.[14] MDT-related work is also more challenging to quantify than daily scheduled activities. Therefore, it is often difficult to obtain the corresponding resources or salary support,[15] which can generate negative sentiments among healthcare professionals and hamper their motivation to participate in MDT, thereby impacting its effectiveness. Balasubramaniam et al[16] indicated that if management treated MDT meetings as a protected meeting, healthcare professionals' willingness to participate would increase. However, prior research predominantly relied on qualitative interviews and lacked quantitative assessments of the factors influencing healthcare professionals' preferences for MDT participation. Evidence regarding staff preferences in different scenarios for MDT participation is also relatively limited.

Discrete choice experiments (DCEs) are effective quantitative techniques for elucidating preferences and assessing the effects of the influencing factors.[17] DCE differs from traditional quantitative methods in that it presents different work scenarios and analyzes individual choices.[18] Thus, this approach not only captures preferences more accurately in different situations than attitudes alone but also offers greater specificity. DCE has been widely adopted in healthcare, with its applications ranging from optimizing medical service delivery to accurately satisfying patient needs and even guiding the rational allocation of healthcare human resources.[19–24] DCE can reveal key preferences and influencing factors through simulating various scenarios and analyzing individual choices. Therefore, DCE can be used to identify the key attributes influencing healthcare professionals' willingness to participate in MDTs, helping managers implement more targeted policy interventions.

This study aims to examine healthcare professionals' preference attributes and their relative importance regarding participation in MDTs in tertiary public hospitals through a DCE, contributing towards enhancing the motivation of healthcare professionals to engage in MDT and ensuring their active participation in the process. It also calculated the willingness to pay (WTP, calculated as the marginal rate of substitution between non-monetary attributes and those with monetary value). Additionally, we simulated different policy scenarios to quantify staff choice propensities in various decision-making contexts to provide evidence-based support for developing strategies conducive to sustainable and efficient MDT implementation.

Materials and Methods

Study Setting

Hangzhou is the capital city of Zhejiang Province, China, with a population of 12.37 million in 2022 and abundant smart healthcare resources.[25] With the development of medical technology and the growing social demand for medical and health services, tertiary hospitals in Hangzhou began exploring a multidisciplinary treatment model in 2018. This model considers patient needs at the core, utilizes information technology as support, and provides stagewise and disease-specific full-cycle MDT services for both outpatients and inpatients. Tertiary hospitals in Hangzhou are accelerating the construction of specialized MDT centers to expand the coverage of quality medical resources and establish internationally influential MDT brands. To date, 20 tertiary hospitals in Hangzhou have successfully implemented mature MDT services, with over 50,000 MDT cases annually, and involving at least 3,000 experts.

Identification of Attributes and Levels for DCE

This study followed the International Society for Pharmacoeconomics and Outcomes Research (ISPOR) Good Research Practice Report for conducting DCEs in healthcare.[26] To identify the attributes and levels, we conducted a targeted literature review[14,27] and preliminarily identified nine preference attributes (economic and non-economic) influencing healthcare professionals' preferences regarding participation in MDTs and defined levels for each of them. The attributes included salary subsidies, leadership attention, patient participation, quality assessment, work intensity, case complexity, team composition, leadership style, and team atmosphere. Subsequently, in-depth interviews were conducted with 14 MDT service providers to validate these attributes and finalize the levels. Based on their suggestions on the importance and feasibility of attributes and levels, we excluded three attributes (team composition, leadership style, and team atmosphere). We ultimately designed a DCE questionnaire containing six attributes. Table 1 presents the attribute descriptions and levels.

Design of the Experiment and the Questionnaire

A full factorial design that considered all possible combinations of attributes and levels would generate 192 ($3\times2^4\times4$) choice sets, which would not be feasible for individual respondents. Therefore, using SPSS 26.0, a fractional factorial design was adopted to reduce the number of choice sets to a more manageable level, ultimately yielding 12 MDT choice sets. Figure 1 illustrates an example of a choice set. The remaining choice sets are presented in Supplementary Figures 1–11. To further reduce cognitive burden, the 12 choice tasks were randomly divided into two versions of six choice sets each. The respondents

Table 1 Attributes and Associated Levels Identified for the Discrete Choice Experiment

Attribute	Description	Level
Salary subsidies	Average pay subsidy per MDT case attended	100 CNY [Reference]
		200 CNY
		300 CNY
Leadership attention	Level of importance attached to MDTs by hospital leadership	Emphasize
		Neglect [Reference]
Patient participation	Whether or not the patient participates in MDTs	Participation in MDTs
		No participation in MDTs [Reference]
Quality assessment	Whether hospitals assess the quality of MDT consultation and treatment	Assess quality
		None [Reference]
Working intensity	Average duration of MDTs per case	Meeting duration <0.5 h [Reference]
		Meeting duration 0.5–1 h
		Meeting duration 1–1.5 h
		Meeting duration > 1.5 h
Case complexity	Complexity of MDT cases	Generally complex [Reference]
		Extremely complex

Notes: The meaning of "Reference" in this table is to designate this level as the point of comparison or reference, and it does not refer to a placeholder for a reference citation.

Attribute	Situation A	Situation B
Salary subsidies	100 CNY	300 CNY
Leadership attention	Neglect	Emphasize
Patient participation	Participation in MDT	No participation in MDT
Quality assessment	None	Assess quality
Working intensity	Meeting duration<0.5h	Meeting duration 1-1.5h
Case complexity	Generally complex	Extremely complex
In which situation would you prefer to participate in MDT?	○	○

Figure 1 Choice task example in the discrete choice experiment.

were asked to answer one version at random. Additionally, we included one repeated-choice set in each version to check for internal consistency in the responses. Respondents who did not pass the internal validity check were excluded from the analysis. The questionnaire consisted of two parts: part one included the choice scenario questions and part two collected respondents' socio-demographic characteristics, including gender, age, occupational groups, professional title, and years of participation in MDT. Prior to the final study, a pilot study was conducted to validate the understandability and acceptability of the questionnaire, with modifications for enhanced clarity based on feedback.

Study Population, Sample Size, and Data Collection

Based on Johnson and Orme's[28] empirical rule for calculating the required sample size, the formula is $n \geq (500c)/(ta)$, where "c" represents the maximum number of levels among attributes, "t" the number of choice tasks, and "a" the number of alternatives in each choice task. Thus, this study required a minimum of 167 participants $(500\times4)/(6\times2)$. Considering the possibility of invalid questionnaires, we increased the sample size by an additional 20% to ensure study reliability. Face-to-face surveys were distributed to 200 healthcare professionals. Interviewers alternated between questionnaire versions during the investigation to balance the sample size distribution between the two versions.

The data were collected between October 2021 and March 2022. To ensure representativeness and balance, we selected three different areas in Hangzhou as the research sample based on their geographical distributions: eastern (including Linping and Xiaoshan), central (including Xihu and Gongshu), and western (including Linan and Tonglu). In each area, we selected one tertiary public hospital that conducted MDT diagnosis and treatment and surveyed 20–40 healthcare professionals based on the MDT scale and implementation in the target hospital. The inclusion criteria were as follows: (1) clinical doctors, nurses, and technicians participating in MDTs; (2) working in the hospital during the survey period and participating in MDT for over six months; and (3) willingness to participate in this study. The exclusion criteria were as follows: (1) not on duty or refusing to participate, (2) healthcare professionals who only observed MDT case discussions, and (3) administrative and logistics staff involved in MDT organizations and management.

Ethical Considerations

This study was approved by the Ethics Review Committee of Hangzhou Normal University (approval number 2022–1121). Before the questionnaire surveys, we briefly presented the purpose of the study to the participants and obtained their written informed consent. All procedures were performed in accordance with the ethical standards of the Committee on Human Experimentation and Declaration of Helsinki.

Statistical Analysis

All data analyses were performed using STATA (version 18.0; StataCorp). The results of the descriptive analysis of participants' socio-demographic characteristics are presented as frequencies and percentages. Except for the salary subsidy variable, which is continuous, all other attributes were set as discrete variables. With a preference for MDT participation as the dependent variable, conditional logit modeling was used to analyze the data and quantify the preferences of healthcare professionals regarding its different attributes. This model is based on the random utility framework, in which the utility function can be expressed as:

$$U_{njt} = V_{njt} + \varepsilon_{njt} = \beta_n^{'} X_{njt} + \varepsilon_{njt}$$

where U_{njt} refers to the utility that respondent N obtains, by choosing alternative J in choice scenario t. U_{njt} comprises an observable component V_{njt}, and an unobservable component. ε_{njt} The utility of the observable component is equal to attribute level vector X_{njt}, multiplied by coefficient vector. $\beta_n^{'}$ The unobservable part is a random error term.

Based on this, we can calculate the relative importance of each attribute, which is the proportion of the preference weight (the utility value of the best level minus the utility value of the worst level for the same attribute) of that attribute to the sum of all attribute weights. Additionally, this study measured healthcare professionals' WTP for participation in MDTs by calculating the ratio of the utility values of each attribute level to the negative utility value of the salary subsidies attribute. This indicates healthcare professionals' willingness to forgo salary subsidies to improve other incentives. Further subgroup analyses were conducted based on gender, age, occupational group, professional title, and years of participation in MDTs. By comparing the WTP values of the subgroups to improve the five factors, we drew policy implications for effectively enhancing non-economic incentives and increasing healthcare professionals' willingness to participate in MDTs. Finally, a simulation study was conducted to understand how the probability of healthcare professionals choosing to participate in the MDT changes with variations in the levels of different attributes.

Results

Respondent Characteristics

A total of 180 healthcare professionals completed the questionnaire (excluding those who did not pass the internal validity test; n=20), with a response rate of 90%. Among them, the majority (51.7%) were female, with ages predominantly distributed between 41 and 50 years old (47.2%). Doctors accounted for 78.9% of the occupational groups. Additionally, 46.7% of the participants had 5 or more years of experience in MDT work. Only 31.2% of participants had an intermediate title level. Table 2 presents the socio-demographic data of the respondents included in the analysis.

DCE Analysis and Logit Model

Table 3 presents the results of the conditional logit model. All attributes were statistically significant, indicating that the selected attributes influenced professionals' willingness to participate in MDT. Specifically, healthcare professionals paid particular attention to leadership attitudes and strongly preferred to be supported rather than ignored by leadership (β=2.417; p<0.001). Additionally, healthcare professionals were more inclined to participate in MDTs implementing quality assessment instead of those without quality assessment (β=0.922; p<0.001). Similarly, patient participation (patient participation in MDTs vs non-participation) increased healthcare professionals' willingness to participate in MDTs, but the impact was relatively small (β=0.574; p<0.001). However, heavy workloads (meeting duration >1.5 h vs meeting duration <0.5 h) and more complex cases (extremely complex vs generally complex) hindered healthcare professionals' willingness to participate in MDTs (β=−1.730; p<0.001; β=−0.543; p=0.003).

The WTP analysis revealed the salary subsidies healthcare professionals were willing to forgo for ideal MDT attribute levels compared with the reference standards. Specifically, compared with situations without leadership attention, professionals were willing to give up CNY 277.6 to participate in the MDT and receive leadership support. For patient participation, professionals were willing to sacrifice CNY 65.9 to gain experience with MDTs where patients could directly participate in discussions and decision-making. Additionally, compared to MDTs without quality assessment,

Table 2 Descriptive Information and Statistics of Study Participants

Characteristics	N=180	%
Gender		
Male	87	(48.3)
Female	93	(51.7)
Age, y		
30–40	64	(35.6)
41–50	85	(47.2)
>50	31	(17.2)
Occupational groups		
Doctors	142	(78.9)
Nurses and medical technicians	38	(21.1)
Professional Title		
Intermediate title	56	(31.2)
Deputy Senior Professional Title	62	(34.4)
Senior professional title	62	(34.4)
Participation in MDT, y		
<1	32	(17.8)
1–2	34	(18.9)
3–4	30	(16.7)
≥5	84	(46.7)

Table 3 Conditional Logit Estimates and WTP (N = 180)

Attributes and their levels	Coefficients	SE	*P*-value	95% CI	WTP	95% CI
Salary subsidies (unit: 100 CNY)	0.871	0.114	<0.001	0.648 to 1.094		
Leadership attention (ref: Neglect)						
Emphasize	2.417	0.211	<0.001	2.003 to 2.831	−2.776	−3.522 to −2.030
Patient participation (ref: No participation in MDT)						
Participation in MDT	0.574	0.163	<0.001	0.255 to 0.892	−0.659	−1.003 to −0.314
Quality assessment (ref: None)						
Assess quality	0.922	0.166	<0.001	0.597 to 1.246	−1.059	−1.504 to −0.613
Working intensity (ref: Meeting duration <0.5 h)						
Meeting duration 0.5–1 h	−0.755	0.213	<0.001	−1.172 to −0.337	0.867	0.354 to 1.379
Meeting duration 1–1.5 h	−1.695	0.239	<0.001	−2.163 to −1.228	1.947	1.368 to 2.526
Meeting duration >1.5 h	−1.730	0.265	<0.001	−2.249 to −1.211	1.987	1.246 to 2.728
Case complexity (ref: Generally complex)						
Extremely complex	−0.543	0.185	0.003	−0.906 to −0.180	0.623	0.138 to 1.108
LR chi2(8)	555.380					
Number of observations	2160					
Log-likelihood	−1175.509					
AIC	2369.019					
BIC	2419.915					

Notes: SE: standard error, CNY: Chinese yuan, ref: reference, AIC: Akaike information criterion, BIC: Bayesian information criterion, 95% CI: 95% confidence interval; instances with a meeting duration of exactly one hour are included in the "Meeting duration 0.5–1 h" group.

professionals were willing to forfeit CNY 105.9 to engage in MDTs with quality assessment. However, the situations differed in terms of work intensity and case complexity. Compared with lower work intensity, professionals required an additional compensation of CNY 173 to participate in higher-intensity MDTs. As opposed to generally complex cases, they needed additional CNY 54.3 to discuss extremely complex ones.

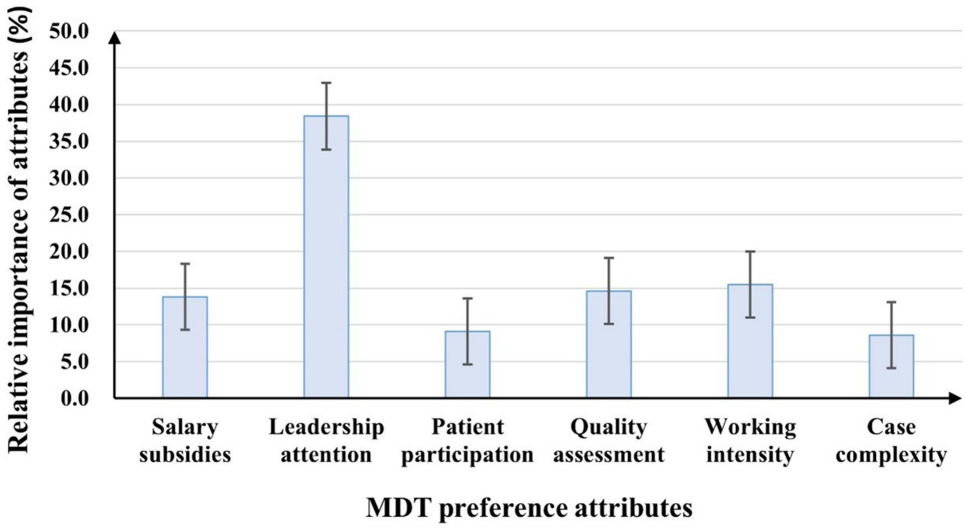

Figure 2 Relative importance of preference attributes of MDTs.

Figure 2 shows the relative importance scores, indicating that healthcare professionals emphasized leadership attention most (score of 38.4%), with a markedly higher priority than other attributes such as salary subsidies, quality assessment, and working intensity. Patient participation and case complexity had relatively low importance scores at 9.1% and 8.6%, respectively.

Subgroup Analysis

The detailed results of the subgroup analyses are shown in Supplementary Tables 1–5, and the WTP results for the subgroups are shown in Figure 3, which indicate that most attributes were statistically significant in influencing healthcare professionals' preferences for MDT participation. However, patient participation and case complexity exhibited differentiated preference patterns among the subgroups. Compared to healthcare professionals aged 30–40, with nursing and medical qualifications, intermediate professional titles, and less than 5 years of work experience, those over 40 years old, with doctoral qualifications, senior professional titles, and over five years of work experience, were more inclined to collaborate in MDTs involving patient participation. Furthermore, compared to healthcare professionals under 40 years old and over 50 years old, those aged 41–50 were more inclined to participate in MDT for cases with a lower level of complexity.

Simulation of Different Scenarios

Figure 4 presents the results of the analysis of different scenarios. The benchmark scenario was set for a salary subsidy of CNY 100 without leadership attention, no patient participation, lack of quality assessment, high working intensity (meeting duration >1.5 h), and extremely complex cases. Compared with the benchmark and keeping other conditions unchanged, 66.98% of professionals chose to participate in MDTs if leadership attention improved from "neglect" (benchmark scenario) to "emphasis" (Scenario 3). In Figure 4, (A) represents the optimal incentive combination, which is derived from screening and combining the most significant levels of incentive attributes (salary subsidy of CNY 200, leadership attention, patient participation, quality assessment, meeting duration <0.5 h, and generally complex cases). This combination could raise the probability of healthcare professionals' participation to 93.83%.

Discussion

This study conducted an in-depth exploration of healthcare professionals' preferences regarding MDT participation in Hangzhou, China. The key factors influencing healthcare professionals' willingness to participate were analyzed from both economic and non-economic perspectives. The results indicated that leadership attention was the most critical factor that affected their willingness to participate in MDTs. Factors such as salary subsidies, quality assessment, and work

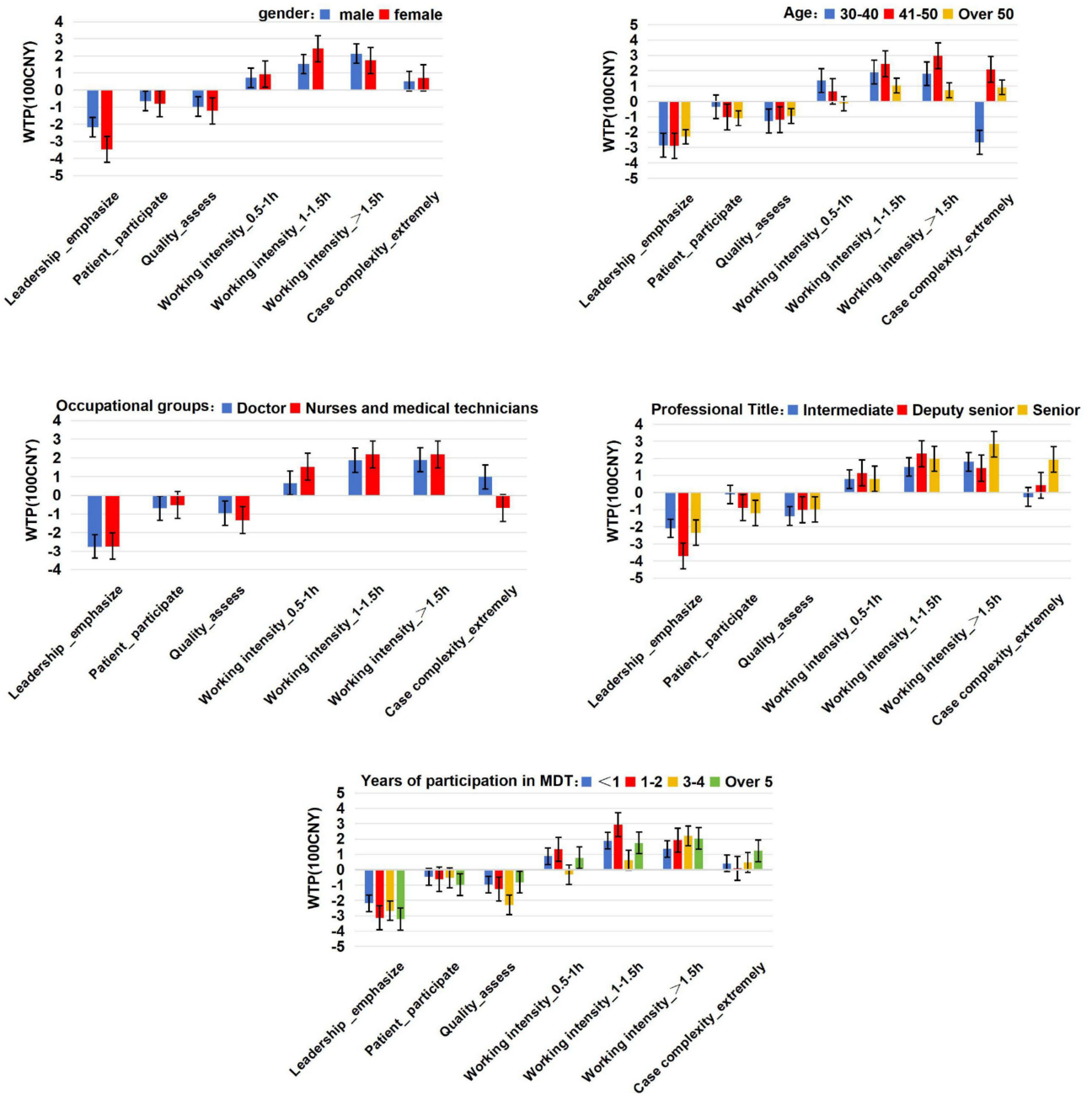

Figure 3 Willingness-to-pay estimation for subgroup population.

intensity also played important roles, with their importance surpassing that of patient participation and case complexity. Differentiated preference patterns among the subgroups were also identified. This study revealed the complex dynamics of healthcare professionals' preferences for MDT participation and highlighted the importance of dynamically formulating incentive policies.

The results demonstrate that economic incentives are crucial to ensuring healthcare professionals' participation in MDT. Increasing salary subsidies can effectively enhance these professionals' positivity toward participation, but it also diminishes the marginal utility of an increase in subsidies. This is consistent with Rynes et al's[29] results regarding employee incentive measures, which revealed that compensation level is one of the most concerning incentives for employees and can effectively inspire staff enthusiasm. Given that preparing healthcare professionals for case discussions often requires extra time and effort, providing appropriate economic compensation becomes necessary because it can

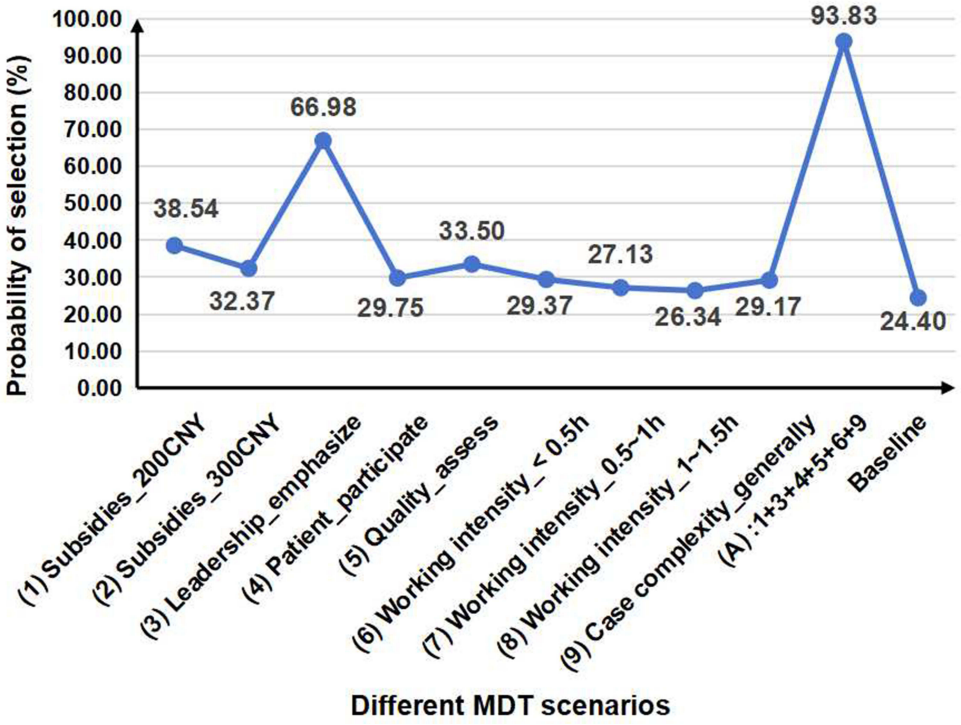

Figure 4 Policy simulation analysis for accepting MDTs with specific attributes.
Notes: (**A**) represents the optimal incentive combination, which is derived from screening and combining the most significant levels of incentive attributes (salary subsidy of CNY 200, leadership attention, patient participation, quality assessment, meeting duration <0.5 h, and generally complex cases).

stimulate their work enthusiasm and strengthen their willingness to participate in MDTs.[15] Balasubramaniam et al[16] also supported the view that healthcare professionals regard compensation subsidies as a form of recognition for their labor value; thus, ensuring the fairness and reasonability of subsidies can promote improvements in work motivation and job satisfaction. From the perspective of economic incentive theory,[30] using salary subsidies as rewards for participating in MDTs is an effective approach to enhance healthcare professionals' motivation to participate. Therefore, our study emphasizes the importance of providing appropriate salary subsidies for healthcare professionals and suggests implementing differentiated salary subsidy strategies based on their different roles and contributions to MDTs. In addition, outstanding MDTs can be selected once every quarter or every 6 months, and a unique reward fund can be established to felicitate and recognize them, to encourage healthcare professionals to participate in MDT.

Among the non-economic incentive factors, the degree of leadership attention to MDTs promoted healthcare professionals' willingness to participate. Similar results have been reported in studies from Europe,[31] Canada,[32] and Australia,[33] wherein if the management regards MDTs as "real work", it usually means MDT implementation can gain more resource support, such as adequate staffing, advanced technical equipment (eg, video conference systems, radiologic image display devices), and suitable space facilities. This allows healthcare professionals to feel that their efforts and contributions are recognized and valued, increasing their self-worth and improving their willingness to participate in MDTs.[34] Hospitals should therefore establish specialized MDT reporting systems that strengthen the promotion of in-hospital MDTs. This system requires MDTs to regularly submit detailed work reports to the management to demonstrate their effectiveness and value. These reports can cover key indicators such as therapeutic effects, cost-effectiveness, and patient satisfaction, thereby promoting sustained leadership attention and support for MDT work.

Patient participation also exerted a positive influence on healthcare professionals' preferences for participating in MDTs, which is consistent with the conclusions made by Berben[35] and Dongen et al.[36] Patient participation in MDTs can promote open and participatory communication between patients and doctors, enhance mutual understanding, recognition, and trust. This could help build closer doctor-patient relationships and strengthen healthcare professionals' willingness to participate in MDTs.[37] A further subgroup analysis showed that, compared with nursing and technical staff

with shorter work experience and intermediate titles, senior doctors with longer work experience considered positive patient participation more conducive to enhancing their preferences for participating in MDTs. This situation is understandable, as physicians with more clinical practice experience have richer experience and professional knowledge and can better appreciate the importance of patient-centered approaches in medical services. Simultaneously, a promotion implies increased clinical decision-making responsibility, and patient participation in MDTs can help decision-makers enhance their decision confidence.[38] Therefore, this study encouraged appropriate patient and family participation in MDT discussions through the following approaches. First, healthcare professionals educated patients and their families on health issues and explained the advantages of MDTs to enhance their understanding and trust. Second, we set up dedicated patient participation sessions, to ensure that patients' voices were fully heard and considered by healthcare professionals.

Quality assessment is also a key factor in promoting healthcare professionals' preferences for participating in MDTs, consistent with the conclusions of Taylor et al,[39] who found that 85% of healthcare professionals believed that quality assessment was crucial for MDT implementation. Pursuing excellence in patient healthcare quality is an important driving force for healthcare professionals' active participation in MDTs. Quality assessment provides clear goals for healthcare professionals and helps drive the continuous improvement and enhancement of healthcare quality, thereby strengthening their motivation to participate in MDTs.[40] Therefore, it is critical to establish an open and transparent quality assessment mechanism for evaluating and monitoring MDT quality. A practical and feasible strategy would be linking assessment results to healthcare professionals' performance incentives (ie, adopting a strategy combining incentives and constraints) to effectively guide their commitment to quality improvement work and stimulate their enthusiasm. The assessment results can also serve as an important reference factor for healthcare professionals' future career development, encouraging them to improve their professional skills and accumulate valuable experience, thereby enhancing their intrinsic motivation to participate.

In addition, the influence of working intensity on MDT work should not be ignored. Our results showed that the average duration of MDT discussions had a negative impact on healthcare professionals' preferences for participating in MDTs. Prior longitudinal research has also provided similar evidence that excessively long MDT discussion times lead to decision fatigue in healthcare professionals, subsequently inducing work fatigue and reducing their willingness to participate.[41] In the current healthcare system of China, due to the relative weakness of primary healthcare forces, the incomplete and ineffective implementation of the tiered diagnosis and treatment system, as well as the entrenched medical-seeking mindset of some patients that is difficult to change rapidly, healthcare professionals in tertiary hospitals are confronted with immense diagnostic and treatment pressures.[4] Though most healthcare professionals participating in MDTs are experienced experts, when faced with the high intensity of clinical workloads, they often struggle to dedicate sufficient energy to fully and deeply engage in MDT work, subsequently diminishing their ongoing willingness to participate. In this case, the MDT coordinators play a critical role[42] and should provide full administrative and documentation support for pre-, intra-, and post-meeting MDT case discussions. This will ensure the efficient organization and implementation of MDTs, such as preparing the required clinical data, clarifying meeting agendas, and recording key patient management decisions. Reasonably controlling MDT working hours helps alleviate the working intensity of healthcare professionals.

This study also found that case complexity hindered healthcare professionals' preference for participating in MDTs. Extremely complex cases may involve more uncertainty, highly stressful work environments, and heavier decision burdens, putting tremendous work pressure on healthcare professionals and weakening their willingness to participate in MDTs.[43] Unlike the conclusions of Nisbet et al[44] junior-ranked healthcare professionals tended to consider complex cases as opportunities for professional learning and growth, which boosted their preference for participating in MDTs. This discrepancy may stem from the different topics for different titles. This study mainly included intermediate and senior-title healthcare professionals who expressed concerns about the practicality of the teaching functions of MDT meetings and better understood the risks hidden in handling extremely complex cases; thus, they may have a more prudent attitude.[45] The subgroup analysis showed that case complexity had a stronger inhibitory effect on the preferences of healthcare professionals aged 41–50 years compared to those aged below 40 and above 50 years. This may be related to the fact that they were in the plateau period of their careers, with more career fatigue, making them less willing to

devote time and effort to exploring and handling extremely complex cases. To alleviate this problem, highly motivated healthcare professionals should be prioritized when establishing MDT expert teams, taking into full consideration their calling for MDT collaboration. Furthermore, the introduction of an MDT Case Complexity Measurement Tool is recommended to categorize cases based on their degree of difficulty, enabling the prioritization of resources like advanced expert guidance and cutting-edge equipment support to be allocated to teams or individuals who frequently handle highly complex cases. Continuous professional training and education should be also provided to boost their professional confidence and reduce uncertainty in managing complex cases, and thereby strengthen the subjective initiative of healthcare professionals.

Limitations

This study has some limitations. First, it focused solely on healthcare professionals in Hangzhou, China, a developed region in eastern China, but did not include central or western China. The economic and population differences between regions may, therefore, limit the generalizability of the results. Future research should expand the sample selection scope, use stratified random sampling methods, and conduct surveys separately by region based on the economic level of each province to improve representativeness. Second, while the study attempted to identify key factors influencing healthcare professionals' preferences for participating in MDTs through a combination of literature review and qualitative interviews, factors such as team atmosphere, leadership style, and team composition may have been overlooked. Therefore, subsequent research should delve deeper into how these factors affect healthcare professionals' preferences for participation in MDTs.

Conclusion

To the best of our knowledge, this is the first survey to explore the preferences of tertiary hospital healthcare professionals in China regarding MDT participation. Our findings highlight that leadership attention to MDTs, work intensity, and quality assessment are the top three critical factors influencing healthcare professionals' willingness to participate in MDTs, whereas case complexity has the lowest impact. In addition, our analyses revealed significant differences in preferences among subgroups of healthcare workers, suggesting the need for more targeted incentive policies. An in-depth understanding of healthcare professionals' preferences for MDT participation is essential for designing effective incentive policies. Hospital administrators should consider demonstrating their support for MDTs. They should also establish and refine a multi-dimensional performance evaluation system for hospital MDTs, utilize MDT case complexity measurement tools to categorize different cases based on their difficulty levels, and allocate additional salary subsidies and special honors to healthcare professionals who engage in discussions on more complex cases. Policymakers should introduce supportive policies that align with the healthy development of MDTs, enabling tertiary hospitals to free up or redirect a portion of their human and material resources and fostering the implementation of MDTs in these institutions.

Data Sharing Statement

The raw data supporting the conclusions of this article will be made available from the corresponding author upon request.

Informed Consent Statement

Informed consent was obtained from all participants involved in the study.

Acknowledgments

We want to express our deepest gratitude to the Health Commission of the Zhejiang Province for their support in conducting this study. We would also like to thank all study participants for their time. We are also grateful to Jixiang Lai, who helped us improve this paper.

Author Contributions

All authors made a significant contribution to the work reported, whether that is in the conception, study design, execution, acquisition of data, analysis 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

This research was funded by the National Natural Science Foundation of China Project (grant number 72274049) and the Philosophy and Social Science Project of Zhejiang Province (grant numbers 23YJRC11ZD and 23YJRC11ZD-3YB).

Disclosure

Professor Hailong Zhu reports grants from Zhejiang Social Science Union, during the conduct of the study. The authors declare no other competing interests in this work.

References

1. Makary MA. Multidisciplinary teams and clinics: better care or just more care. *Ann Surg Oncol*. 2011;18:2105–2106. doi:10.1245/s10434-011-1678-3
2. Harrison JD, Choy ET, Spillane A, Butow P, Young JM, Evans A. Australian breast cancer specialists' involvement in multidisciplinary treatment planning meetings. *Breast*. 2008;17(4):335–340. doi:10.1016/j.breast.2008.03.001
3. European Partnership Action Against Cancer consensus group, Borras JM, Albreht T, Audisio R, et al. Policy statement on multidisciplinary cancer care. *Eur J Cancer*. 2014;50(3):475–480. doi:10.1016/j.ejca.2013.11.012.
4. Zhong X, Zeng X, Zhao L, Tao C, Min X, He R. Clinicians' knowledge and understanding regarding multidisciplinary treatment implementation: a study in municipal public class III grade A hospitals in Southwest China. *BMC Med Educ*. 2023;23(1):916. doi:10.1186/s12909-023-04891-0
5. Walke LM, Rosenthal RA, Trentalange M, et al. Restructuring care for older adults undergoing surgery: preliminary data from the co-management of older operative patients en route across treatment environments (CO-OPERATE) model of care. *J Am Geriatr Soc*. 2014;62(11):2185–2190. doi:10.1111/jgs.13098
6. Bilfinger TV, Albano D, Perwaiz M, Keresztes R, Nemesure B. Survival outcomes among lung cancer patients treated using a multidisciplinary team approach. *Clin Lung Cancer*. 2018;19(4):346–351. doi:10.1016/j.cllc.2018.01.006
7. Lecat CSY, Fisher A, Atta M, et al. High patient satisfaction and increased physical activity following a remote multidisciplinary team in a multiple myeloma clinic. *Support Care Cancer*. 2023;31(2):127. doi:10.1007/s00520-023-07587-9
8. Deneckere S, Euwema M, Lodewijckx C, et al. Better interprofessional teamwork, higher level of organized care, and lower risk of burnout in acute health care teams using care pathways: a cluster randomized controlled trial. *Med Care*. 2013;51(1):99–107. doi:10.1097/MLR.0b013e3182763312
9. Wolk CB, Stewart RE, Eiraldi R, Cronholm P, Salas E, Mandell DS. The implementation of a team training intervention for school mental health: lessons learned. *Psychother*. 2019;56(1):83–90. doi:10.1037/pst0000179
10. Bydder S, Hasani A, Broderick C, Semmens J. Lung cancer multidisciplinary team meetings: a survey of participants at a national conference. *J Med Imaging Radiat Oncol*. 2010;54(2):146–151. doi:10.1111/j.1754-9485.2010.02154.x
11. Rui L, Xiaohu W, Mo Z, Song W. Analysis on the influencing factors and countermeasures of the implementation of multiple disciplinary team in a tertiary general hospital in Anhui Province (in Chinese). *Anhui J Prev Med*. 2020;26(02):96–98.
12. Jalil R, Ahmed M, Green JS, Sevdalis N. Factors that can make an impact on decision-making and decision implementation in cancer multidisciplinary teams: an interview study of the provider perspective. *Int J Surg*. 2013;11(5):389–394. doi:10.1016/j.ijsu.2013.02.026
13. Soukup T, Lamb BW, Arora S, Darzi A, Sevdalis N, Green JS. Successful strategies in implementing a multidisciplinary team working in the care of patients with cancer: an overview and synthesis of the available literature. *J Multidiscip Healthc*. 2018;11:49–61. doi:10.2147/JMDH.S117945
14. Taylor C, Munro AJ, Glynne-Jones R, et al. Multidisciplinary team working in cancer: what is the evidence? *BMJ*. 2010;340:c951. doi:10.1136/bmj.c951
15. Maharaj AD, Evans SM, Zalcberg JR, et al. Barriers and enablers to the implementation of multidisciplinary team meetings: a qualitative study using the theoretical domains framework. *BMJ Qual Saf*. 2021;30(10):792–803. doi:10.1136/bmjqs-2020-011793
16. Balasubramaniam R, Subesinghe M, Smith JT. The proliferation of multidisciplinary team meetings (MDTMs): how can radiology departments continue to support them all? *Eur Radiol*. 2015;25:3679–3684. doi:10.1007/s00330-015-3760-x
17. Haddadfar A, Emamgholipour S, Razani M, Salehnejad MH. Nurses' job preferences for working in deprived areas in Tehran: a discrete choice experiment. *Hum Resour Health*. 2023;21(1):91. doi:10.1186/s12960-023-00875-9
18. Rockers PC, Jaskiewicz W, Wurts L, et al. Preferences for working in rural clinics among trainee health professionals in Uganda: a discrete choice experiment. *BMC Health Serv Res*. 2012;12:212. doi:10.1186/1472-6963-12-212
19. Wang X, Song K, Chen L, Huang Y, Birch S. Eliciting preferences of providers in primary care settings for post hospital discharge patient follow-up. *Int J Environ Res Public Health*. 2021;18(16):8317. doi:10.3390/ijerph18168317
20. Tobin K, Maguire S, Corr B, Normand C, Hardiman O, Galvin M. Discrete choice experiment for eliciting preference for health services for patients with ALS and their informal caregivers. *BMC Health Serv Res*. 2021;21:213. doi:10.1186/s12913-021-06191-z
21. Mansfield C, Gebben DJ, Sutphin J, et al. Patient preferences for preventive migraine treatments: a discrete-choice experiment. *Headache*. 2019;59(5):715–726. doi:10.1111/head.13498
22. Shrime MG, Weinstein MC, Hammitt JK, Cohen JL, Salomon JA. Trading bankruptcy for health: a discrete-choice experiment. *Value Health*. 2018;21(1):95–104. doi:10.1016/j.jval.2017.07.006

23. Liu P, Liu S, Gong T, Li Q, Chen G, Li S. Job preferences of undergraduate pharmacy students in China: a discrete choice experiment. *Hum Resour Health*. 2021;19:79. doi:10.1186/s12960-021-00626-8
24. Tian Z, Guo W, Zhai M, Li H. Job preference of preventive medicine students during the COVID-19 pandemic: a discrete choice experiment survey in Shandong Province, China. *BMC Med Educ*. 2023;23(1):890. doi:10.1186/s12909-023-04873-2
25. Hangzhou Municipal Bureau of Statistics. Hangzhou city population main data bulletin; 2022. Available from: https://tjj.hangzhou.gov.cn/art/2023/3/2/art_1229279682_4144649.html. Accessed August 11, 2024.
26. Bridges JF, Hauber AB, Marshall D, et al. Conjoint analysis applications in health—a checklist: a report of the ISPOR good research practices for conjoint analysis task force. *Value Health*. 2011;14(4):403–413. doi:10.1016/j.jval.2010.11.013
27. Powell HA, Baldwin DR. Multidisciplinary team management in thoracic oncology: more than just a concept? *Eur Resp J*. 2014;43(6):1776–1786. doi:10.1183/09031936.00150813
28. Orme B. *Getting Started with Conjoint Analysis: Strategies for Product Design and Pricing Research*. Madison: Research Publishers LLC; 2006.
29. Rynes SL, Gerhart B, Minette KA. The importance of pay in employee motivation: discrepancies between what people say and what they do. *Hum Resour Manag*. 2004;43(4):381–394. doi:10.1002/hrm.20031
30. Weninger Henderson M. The economic case for meeting employees' needs. *J Nurs Manag*. 2020;28(1):17–23. doi:10.1111/jonm.12897
31. Van Belle S. How to implement the multidisciplinary approach in prostate cancer management: the Belgian model. *BJU Int*. 2008;101(S2):2–4. doi:10.1111/j.1464-410X.2007.07489.x
32. Look Hong NJ, Gagliardi AR, Bronskill SE, Paszat LF, Wright FC. Multidisciplinary cancer conferences: exploring obstacles and facilitators to their implementation. *J Oncol Pract*. 2010;6(2):61–68. doi:10.1200/JOP.091085
33. NHMRC National Breast Cancer Centre (Australia). *Multidisciplinary Meetings for Cancer Care: A Guide for Health Service Providers*. National Breast Cancer Centre; 2005.
34. Guerra S, Lambe K, Manolova G, Sadler E, Sheehan KJ. Multidisciplinary team healthcare professionals' perceptions of current and optimal acute rehabilitation, a hip fracture example A UK qualitative interview study informed by the theoretical domains framework. *PLoS One*. 2022;17(11):e0277986. doi:10.1371/journal.pone.0277986
35. Berben K, Dierckx E, Van Hecke A, Verhaeghe S. Participation of inpatients in multidisciplinary team meetings: an explorative study of mental healthcare workers' perception. *Arch Psychiatr Nurs*. 2022;41:277–285. doi:10.1016/j.apnu.2022.07.030
36. van Dongen JJJ, Habets IGJ, Beurskens A, van Bokhoven MA. Successful participation of patients in interprofessional team meetings: a qualitative study. *Health Expect*. 2017;20(4):724–733. doi:10.1111/hex.12511
37. Taylor C, Finnegan-John J, Green JS. "No decision about me without me" in the context of cancer multidisciplinary team meetings: a qualitative interview study. *BMC Health Serv Res*. 2014;14:488. doi:10.1186/s12913-014-0488-2
38. Soukup T, Lamb BW, Green JSA, Sevdalis N, Murtagh G. Analysis of communication styles underpinning clinical decision-making in cancer multidisciplinary team meetings. *Front Psychol*. 2023;14:1105235. doi:10.3389/fpsyg.2023.1105235
39. National Cancer Action Team. The Characteristics of an effective multidisciplinary team (MDT): 2010. Available from: http://www.ncin.org.uk/cancer_type_and_topic_specific_work/multidisciplinary_teams/mdt_development. Accessed March 27, 2024.
40. Lamb BW, Green JS, Benn J, Brown KF, Vincent CA, Sevdalis N. Improving decision making in multidisciplinary tumor boards: prospective longitudinal evaluation of a multicomponent intervention for 1,421 patients. *J Am Coll Surg*. 2013;217(3):412–420. doi:10.1016/j.jamcollsurg.2013.04.035
41. Soukup T, Gandamihardja TAK, McInerney S, Green JS, Sevdalis N. Do multidisciplinary cancer care teams suffer decision-making fatigue: an observational, longitudinal team improvement study. *BMJ Open*. 2019;9(5):e027303. doi:10.1136/bmjopen-2018-027303
42. Fleissig A, Jenkins V, Catt S, Fallowfield L. Multidisciplinary teams in cancer care: are they effective in the UK? *Lancet Oncol*. 2006;7(11):935–943. doi:10.1016/S1470-2045(06)70940-8
43. Eigenmann F. Multidisciplinary team meetings encourage overtreatment. *BMJ*. 2015;351:h4630. doi:10.1136/bmj.h4630
44. Nisbet G, Dunn S, Lincoln M. Interprofessional team meetings: opportunities for informal interprofessional learning. *J Interprof Care*. 2015;29(5):426–432. doi:10.3109/13561820.2015.1016602
45. Raine R, Xanthopoulou P, Wallace I, et al. Determinants of treatment plan implementation in multidisciplinary team meetings for patients with chronic diseases: a mixed-methods study. *BMJ Qual Saf*. 2014;23(10):867–876. doi:10.1136/bmjqs-2014-002818