A Mixed-Methods Study on Behavioral Characteristics of Physician Participation in Shared Decision-Making: Postprint

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Date: 2022-08-01T00:00:00+00:00

Abstract

Background Doctor-patient shared decision-making, as an important manifestation of "patient-centered" care, has not been ideally implemented in clinical practice. As physicians are key agents in promoting the implementation of doctor-patient shared decision-making, research on physician behaviors in the shared decision-making process remains scarce. Objective To explore the process and primary behavioral characteristics of physician participation in doctor-patient shared decision-making, and to provide evidence for promoting the clinical implementation and application of shared decision-making. Methods A convergent design mixed-methods study was employed to collect quantitative and qualitative data simultaneously. The quantitative component used convenience sampling to survey practicing clinicians at a tertiary Grade A hospital in Shanghai from May to December 2020, exploring the current status of physician participation in shared decision-making and conducting K-means clustering on physician shared decision-making behaviors to analyze their distribution characteristics. The qualitative component used convenience and purposive sampling to conduct semi-structured interviews with 23 physicians from the quantitative study between June and December 2020, exploring the process and experiences of physician participation in shared decision-making and identifying the main behavioral characteristics at each decision-making stage. Results Quantitative results: Among 325 physicians, the mean score for participation in shared decision-making behaviors was (80.44$±$14.88). Physicians demonstrated highest participation levels in "explaining advantages and disadvantages of treatment options" and "providing multiple treatment options" ; lowest participation levels were in "informing patients about the need to make an important decision together" and "jointly deciding on a treatment option" . Cluster analysis revealed three behavioral profiles: the "Informed Consent group" , "Partial Patient Participation group" , and "Shared Decision-Making group" . Qualitative results: Physician participation behaviors in the

doctor-patient shared decision-making process comprised: (1) creating decision awareness, (2) providing information, (3) checking patient understanding of information, (4) clarifying values, (5) joint deliberation (evaluation of treatment options), and (6) decision-making and implementation. Mixed-methods results: During the decision-making process, physicians focused predominantly on information provision while neglecting behavioral elements at the doctor-patient communication level that facilitate patient participation, with varying characteristics across different physician participation behaviors. Conclusion The implementation of doctor-patient shared decision-making behaviors is limited, and physicians harbor misconceptions about the shared decision-making behavioral process. Interventions addressing knowledge and attitudes can help physicians clarify the shared decision-making process, deepen their understanding through scenario simulation and role-playing, and enhance their recognition of patient decision-making values, thereby promoting genuine implementation of doctor-patient shared decision-making in clinical practice.

Full Text

Preamble

A Mixed-Methods Study on Behavioral Characteristics of Physician Participation in Shared Decision-Making

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Abstract

Background: Shared decision-making (SDM), as a crucial manifestation of patient-centered care, has seen suboptimal implementation in clinical practice. Physicians are key participants in promoting SDM implementation, yet few studies have examined physician behavior during the SDM process.

Objective: To explore the process and primary behavioral characteristics of physician participation in SDM, providing evidence for promoting and implementing SDM in clinical practice.

Methods: A mixed-methods convergent design was employed to collect and analyze quantitative and qualitative data simultaneously. The quantitative study used convenience sampling to survey in-service physicians at a tertiary Grade A hospital in Shanghai from May to December 2020, exploring the current status of physician participation in SDM. K-means clustering was performed to ana-

lyze the distribution characteristics of physician SDM behaviors. The qualitative study used convenience and purposive sampling to conduct semi-structured interviews with 23 physicians from the quantitative sample between June and December 2020, exploring the process and experiences of physician participation in SDM and identifying key behavioral characteristics at each decision-making stage.

Results: Quantitative results: The average score for physician participation in SDM behaviors among 325 physicians was (80.44$±$14.88). Physicians showed highest participation in "explaining treatment options' advantages/disadvantages" and "providing multiple treatment options" ; lowest participation was observed in "explicitly stating a joint decision is needed" and "jointly selecting a treatment option." Cluster analysis revealed three behavioral characteristic groups: "Informed Consent Group," "Partial Patient Participation Group," and "Shared Decision-Making Group." Qualitative results: Physician participation behaviors in SDM comprised: (1) creating decision awareness, (2) providing information, (3) checking patient understanding, (4) clarifying values, (5) joint deliberation (treatment option evaluation), and (6) decision-making and implementation. Mixed-methods results: During the decision-making process, physicians focused primarily on information provision while neglecting communication-level behaviors that facilitate patient participation. Behavioral characteristics varied significantly among physicians.

Conclusion: SDM behaviors are implemented to a limited extent, and physicians have misconceptions about the SDM behavioral process. Interventions should target knowledge and attitudes to help physicians clarify the SDM process, deepen understanding through scenario simulation and role-playing, and enhance recognition of patients' decisional values to promote genuine SDM implementation in clinical practice.

[**Keywords**] Shared decision-making; Behavioral characteristics; Mixed-methods study

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Introduction

Modern medicine advocates a "patient-centered" service philosophy, with shared decision-making (SDM) as a key manifestation that has garnered widespread attention and endorsement in healthcare [1]. SDM refers to a process where healthcare providers and patients thoroughly discuss treatment options' benefits and risks alongside patients' values and preferences, ultimately reaching a mutual agreement on the final decision [2]. However, research [3, 4] indicates that SDM implementation remains unsatisfactory. Healthcare providers often equate information provision with SDM, neglecting the clarification of patients' values and preferences, which substantially compromises the quality of physician-patient communication. Ineffective communication prevents patients from properly understanding medicine's limitations and treatment uncertainties, fostering

unrealistic expectations. When unexpected outcomes or suboptimal results occur, patients may blame healthcare providers, leading to conflicts and disputes [5]. Therefore, exploring physician behaviors in decision-making is crucial for advancing SDM implementation. While tools exist to measure physician participation in SDM, studies [6] show that despite high SDM questionnaire scores, certain SDM behaviors are not actually exhibited during decision-making. To obtain a more comprehensive perspective and uncover deeper insights, this study employs a mixed-methods approach to comprehensively analyze the process, experiences, and primary behavioral characteristics of physician participation in SDM, aiming to help healthcare providers understand the SDM process and inform targeted intervention strategies for promoting SDM implementation.

1.1 Study Design

Mixed-methods designs include explanatory sequential, exploratory sequential, and convergent designs [7]. This study adopted a convergent design, collecting and analyzing quantitative and qualitative data simultaneously. The quantitative component used questionnaires to explore the current status of physician SDM participation and cluster analysis to identify behavioral distribution characteristics, enabling targeted optimization measures. The qualitative component employed semi-structured interviews to explore physicians' SDM processes, experiences, and key behavioral characteristics. The two datasets were then integrated to comprehensively interpret findings. Compared to other mixed-methods designs, the convergent approach compensates for each dataset' s weaknesses with the other' s strengths, expanding both breadth and depth. See [Figure 1: see original paper].

1.2 Participants

1.2.1 Quantitative Study Participants

Using convenience sampling, in-service physicians at a tertiary Grade A hospital in Shanghai were selected from May to December 2020. Inclusion criteria: (1) licensed physicians in clinical departments with direct patient contact; (2) $ $1 year of clinical experience; (3) informed consent and ability to complete the questionnaire. Exclusion criteria: (1) physicians absent from clinical work for $ $3 months; (2) interns or trainees; (3) physicians in technical departments (e.g., radiology, laboratory). Sample size was estimated at 10-15 times the number of independent variables, with 15-20% attrition, yielding a minimum of 127 participants. Ultimately, 325 eligible physicians were enrolled.

1.2.2 Qualitative Study Participants

From June to December 2020, convenience and purposive sampling were used to select clinical physicians from the quantitative study for semi-structured interviews, using the same inclusion/exclusion criteria. After contacting hospital and department leaders to explain the study purpose and criteria, researchers

purposefully selected participants from different departments, educational backgrounds, and professional titles to maximize representativeness. Sampling continued until data saturation (no new themes emerged). All participants provided informed consent.

1.3 Research Tools

1.3.1 Theoretical Framework

The Interprofessional Shared Decision-Making Model (IP-SDM), proposed by Légaré et al. [8] in 2011, structures SDM across three levels: individual (micro), meso, and macro. The micro-level deconstructs SDM behaviors into: (1) identifying the decision context and creating choice awareness; (2) information exchange; (3) clarifying values/preferences; (4) option feasibility analysis; (5) making or deferring decisions; and (6) implementing and evaluating decisions. This framework provides theoretical grounding for analyzing physician SDM processes and behavioral characteristics.

1.3.2 Quantitative Research Instruments

1.3.2.1 General Information Questionnaire

Developed by researchers based on literature review of key factors influencing SDM, this questionnaire included: gender, age, education, professional title, clinical experience years, department, oncology practice, teaching responsibilities, SDM knowledge level, and overseas study experience (given SDM' s earlier development abroad).

1.3.2.2 Shared Decision-Making Questionnaire-Physician Version (SDM-Q-Doc)

Developed by Scholl et al. [9] from the patient version (SDM-Q-9), this physician-perspective tool assesses SDM behavior levels. The Chinese version by Miao Aiyun [3] demonstrated good reliability (Cronbach' s α=0.938) and validity (content validity=0.95). It contains 9 single-dimension items using a 6-point Likert scale (0=completely inconsistent, 5=completely consistent), with total scores converted to a 100-point scale. Higher scores indicate greater SDM behavior levels. Cronbach' s α in this study was 0.917.

1.3.3 Qualitative Research Instruments

The interview guide was developed through systematic literature review and research team discussion, focusing on study objectives and SDM-Q-Doc content. After pilot interviews with 3 participants and subsequent revisions, the final guide included: (1) How do you develop treatment plans with patients, especially when multiple options exist? (2) What information do you provide, how, and can patients understand it correctly? (3) Do you help patients understand information and weigh risks/benefits together? (4) How important are patients' opinions, and why? (5) Who typically makes final treatment decisions? (6)

How do you understand SDM? Can you share experiences? After understanding physicians' routine decision-making and SDM conceptualization, researchers introduced SDM definitions and clinical examples using standardized language before further exploring participants' SDM experiences.

1.4 Data Collection

1.4.1 Quantitative Data Collection

After obtaining hospital and departmental approval, the researcher distributed questionnaires in person, explaining the study purpose and principles of voluntariness, confidentiality, and informed consent. Physicians were instructed to complete questionnaires independently after full comprehension. The researcher provided on-site clarification for questions and immediately checked returned questionnaires for completeness, supplementing any missing items.

1.4.2 Qualitative Data Collection

The researcher conducted face-to-face semi-structured interviews. Prior to the study, the researcher had completed systematic qualitative research training and established trust with participants through clinical observation as a nursing intern. Interviews were scheduled in advance and conducted in quiet, comfortable, undisturbed locations (conference rooms or offices). After explaining the study purpose and obtaining consent, interviews proceeded with minimal prompting and attention to nonverbal cues. With permission, interviews were audio-recorded (30-60 minutes each). Participants received a summary of key points, and data were transcribed within 48 hours with memos and contact summary sheets documenting reflections.

1.5 Data Analysis

1.5.1 Quantitative Data Analysis

SPSS 24.0 was used for statistical analysis. Normally distributed continuous data were described as mean±SD; non-normally distributed data as median and interquartile range. Categorical data were described using frequencies and percentages. $P<0.05$ indicated statistical significance.

Cluster analysis groups similar objects into classes based on "properties," overcoming subjective classification and revealing relationships. This study used K-means clustering on physician SDM behaviors to clearly visualize behavioral differences and inform targeted optimization strategies.

1.5.2 Qualitative Data Analysis

Analysis was conducted independently by the researcher and a master's-prepared nurse with qualitative research experience, with discrepancies resolved through team discussion. Nvivo 12.0 software managed the data. Colaizzi' s seven-step

method [10] was used for coding and theme development: (1) importing and repeatedly reading transcripts; (2) extracting significant statements; (3) coding recurrent viewpoints; (4) aggregating codes and refining meanings; (5) writing comprehensive descriptions; (6) identifying similarities and conceptualizing themes; (7) returning findings to participants for validation.

1.5.3 Mixed-Methods Integration

Given the alignment between qualitative questions and quantitative items, researchers linked quantitative results to each qualitative theme, identifying discrepancies. The merge technique integrated datasets, with joint display highlighting similarities and differences [11, 12].

2.1 Quantitative Results

2.1.1 Confirmatory Factor Analysis of SDM-Q-Doc

Confirmatory factor analysis of the single-dimension structure using maximum likelihood estimation showed that except for RMR, initial model fit indices (GFI, RMSEA, CFI, NFI, NNFI) failed to meet reference standards. Based on modification indices >10, error covariation was set between items 7 and 8. The revised model showed adequate fit, with all indices except RMSEA meeting or approaching reference standards. See .

Table 1. Confirmatory Factor Analysis Model Fit Indices Before and After Modification

Index	GFI	RMSEA	RMR	CFI	NFI	NNFI	IFI
Reference	>0.9	<0.1	<0.05	>0.9	>0.9	>0.9	>0.9

Note: GFI=Goodness-of-Fit Index, RMSEA=Root Mean Square Error of Approximation, RMR=Root Mean Square Residual, CFI=Comparative Fit Index, NFI=Normed Fit Index, NNFI=Non-Normed Fit Index, IFI=Incremental Fit Index

2.1.2 Physician Demographics

Of 360 distributed questionnaires, 360 were returned. After excluding 35 with patterned responses or incomplete data, 325 valid questionnaires remained (90.3% valid response rate). Participants' ages ranged 22-57 years, with mean $(37.62\$\pm7.41) years and median 38 (32, 42) years. Clinical experience ranged 1 – 36 years, with mean (12.28±$8.27) years and median 12 (5,18) years. Notably, 71.7% had >5 years of experience, and 64.9% participated in teaching. Additionally, 53.5% reported limited SDM knowledge, and 49.8% spent <20 minutes discussing treatment options with patients. See .

2.1.3 Physician SDM Behavior Scores

The average SDM behavior score was (80.44$±$14.88). Substantial variation existed across behaviors. Highest participation occurred in "explaining treatment options' advantages/disadvantages"and "informing patients about multiple treatment options." Lowest participation was in "explicitly stating a joint decision is needed" and "jointly selecting a treatment option with patients." See .

Table 3. Physicians' SDM Behavior Scores (N=325)

Item	Mean±SD	Rank
4. Explained treatment options' advantages/disadvantages in detail	4.38$±0.74|1||3.*Informedpatients~~a~~boutmultipletreatmentoptions*|4.30±0.84|2||6.*Ask*	

2.1.4 Cluster Analysis of Physician SDM Behavioral Characteristics

K-means clustering requires determining the number of clusters (K). This study tested K=2-5. Based on statistical analysis of each solution, K=3 was optimal, yielding three behavioral characteristic groups:

- **Group 1 (Informed Consent Group, n=34):** Lowest participation across most behaviors but relatively higher on items 4 and 9, indicating focus on information provision.
- **Group 2 (Partial Patient Participation Group, n=145):** Moderate participation overall, with relatively higher scores on items 3, 4, 6, and 9, showing attention to patient preferences and values alongside information provision.
- **Group 3 (Shared Decision-Making Group, n=146):** Highest participation across all behaviors, particularly item 7 ("fully weighing pros/cons with patients"), indicating partnership with patients.

See [Figure 2: see original paper].

2.2 Qualitative Results

2.2.1 Interviewee Demographics

Twenty-three physicians (D1-D23) were interviewed: 12 surgeons, 8 internists, and 3 oncologists. See .

2.2.2 Interview Findings

Based on the IP-SDM model [8], physician participation behaviors were categorized as: (1) creating decision awareness, (2) providing information, (3) checking

patient understanding, (4) clarifying values, (5) joint deliberation (treatment option evaluation), and (6) decision-making and implementation.

2.2.2.1 Creating Decision Awareness

Creating decision awareness is the first SDM step, achieved by explicitly explaining that multiple viable treatment options exist, each with trade-offs, necessitating a treatment decision. Decision contexts typically involve choosing among multiple treatments or between treatment and watchful waiting. Interviews revealed that only a minority of physicians explicitly explained the decision context upfront. Most skipped this step, beginning discussions with inquiries or information provision, which often left patients unaware of their opportunity to participate or uncertain how to engage.

D1: "We first explain the condition and its consequences, then the proposed solution, its purpose, risks, and costs. After this, patients usually just sign."

D14: "When patients have options a and b with no clear superiority, we tell them both are available, but we don' t know which is better—they must choose based on their actual situation."

2.2.2.2 Providing Information

Information exchange is a prerequisite for SDM [8]. Physicians should objectively provide information about treatment options, including the health problem, alternatives, benefits, drawbacks, risks, and psychosocial impacts, avoiding intentional or unintentional steering.

Presenting Treatment Options: Most physicians objectively presented viable alternatives. However, some reported typically offering only one option, with personal preferences limiting patients' choice range and hindering SDM.

D18: "From an evidence-based perspective, we objectively tell patients about available good options and which apply to their situation."

D4: "Most cases have only one option. Even with alternatives, we express preference, which may guide patients toward our favored direction—we have some inducement."

Providing Risk-Benefit Information: Some physicians exhibited inducement behavior by preferentially explaining certain options' advantages to guide patients toward their preferred choice.

D5: "During discussion, I tend to emphasize option a is relatively better, with lower risk and more benefits. Patients can tell. When they hear mortality rates of 50% for a and 60% for b, they' ll choose a."

D8: "As physicians, we certainly have preferences. We think one treatment may be better, so we guide families or patients to choose it. Even if drawing lots, it' s what we hope they' ll select."

2.2.2.3 Checking Patient Understanding

Assessing patient comprehension is prerequisite for weighing risks/benefits and clarifying values. Few physicians directly checked understanding or used plain language and diagrams.

D10: "We confirm whether patients understand by asking if they have questions

after explaining. Sometimes we draw diagrams while talking."
Most physicians failed to verify true comprehension, with some believing signed consent forms indicated understanding.
D1: "*It' s hard to know if they (patients/families) truly understand. I know we can' t make them fully understand, but at least we' ve said what needs to be said.*"
D2: "*There' s no better method. We rely on medical documents. If patients sign, it represents understanding—whether true understanding exists is unknown, but signing indicates approval.*"

2.2.2.4 Clarifying Values

Patient values clarification is the cornerstone of SDM, promoting understanding of patients' thoughts, concerns, and facilitating preference formation. Physicians typically assessed values indirectly through subtle probing or subjective inference based on patient characteristics or family circumstances.
D6: "*Through communication, we can roughly guess which option patients will choose, then guide discussion in that direction.*"
D12: "*During rounds, we may not directly ask, but subtly learn about their wishes or actual situation, including family relationships, finances, or fertility requirements, making conversations more targeted.*"
Some physicians acknowledged considering patient values but prioritized medical indicators when conflicts arose with treatment principles (e.g., survival rates).
D7: "*Both patient values and survival rates matter, but personally, I think survival rates are more important.*"

2.2.2.5 Joint Deliberation (Treatment Option Evaluation)

Treatment evaluation involves helping patients weigh different options' risks/benefits, analyzing feasibility, and clarifying personal preferences to inform decision-making [8]. Only a minority viewed themselves as partners with patients in jointly evaluating options; most left deliberation to patients and families after information provision.
D16: "*We should stand united with patients. Physicians don' t work alone. We should tell patients all viable methods, and when they ask our preference between options a and b, we help them analyze pros/cons together.*"
D10: "*For weighing pros/cons, we usually have several family members present, explain all viable options, and tell them they can discuss for a day or two before responding···Economics aren' t our primary concern; our main purpose is treating the disease.*"

SDM involves more than information exchange—it requires deep value alignment. Patients facing decisions are often confused and struggling, needing physician assistance to weigh options and clarify values. When patients experiencing decisional difficulty sought physician opinions, some respondents stated they couldn' t help—this was the patient' s choice. Others said they only provided recommendations to trusted patients.
D14: "*We can' t provide help. They must choose themselves. Outsiders can' t*

make decisions for them; we' re not their parents."
D6: "*Only if the patient trusts me deeply can I share my personal recommendation based on my perspective.*"

2.2.2.6 Decision-Making and Implementation

Treatment decision-making and implementation involve reaching agreement on the final treatment plan after jointly weighing options and clarifying preferences. Only a minority of physicians made decisions jointly with patients; most allowed patients/families to make final choices after communication.
D15: "*The final decision should be made by patients, but both parties can participate in the decision-making process.*"
Some physicians permitted deferred decisions, believing patients—as risk-bearers—needed adequate time for comprehension and deliberation.
D17: "*Most clinical decisions occur during morning rounds, but we try to have all family members present to allow discussion time, not forcing immediate decisions.*"
D12: "*We give patients a thinking process; we don' t require immediate responses, which helps both parties understand each other' s perspectives.*"

2.3 Mixed-Methods Results

Based on qualitative themes, quantitative results were linked to each theme, integrating findings regarding SDM behavioral processes and characteristics. Mixed-methods results revealed that physicians exhibited high participation in information provision but poor performance in creating decision awareness, clarifying values, and joint deliberation—neglecting communication-level behaviors that facilitate patient participation. Three distinct behavioral characteristic groups emerged: the "Informed Consent Group" focused on information provision; the "Partial Patient Participation Group" consciously considered patient values; and the "Shared Decision-Making Group" acknowledged patients' principal role, engaged in joint deliberation, and permitted deferred decisions. See .

Table 5. Joint Presentation of Consistency and Contradiction in Analysis Results

Quantitative Findings	Qualitative Findings	Mixed-Methods Integration
"Explicitly stated a joint decision is needed": 3.72$±1.22(*lowestparticipation*)|4.30±0.84(*highparticipation*)|4.38±0.74(*highestparticipation*)|4.06±0.89(*moderateparticipation*)|4.23±0.85(*highparticipation*)|3.87±1.06(*lowparticipation*)|*MakingGroupdemonstratespartnershipthroughjointdeliberationanddeferreddecisions*, 3.74±$1.03 (low participation)	Minority co-decide with patients; most allow	Most physicians perform poorly in joint

3.1 Overall Moderately High Physician SDM Participation

Quantitative findings showed an average SDM behavior score of (80.44$±$14.88), indicating moderately high participation—consistent with the original scale [13] and Santema et al.' s study [6] but higher than Miao Aiyun' s findings [3]. This may reflect recent healthcare model shifts toward patient-centeredness, with patients' roles gaining prominence. Additionally, most participants were from tertiary hospitals with teaching responsibilities, making them more likely to emphasize clinical standards and communication. However, self-assessment may inflate scores; research [4] found physician-reported SDM scores exceed observer ratings, as physicians may conflate routine practice with SDM while observers don' t witness key SDM elements.

3.2 Emphasizing Decision Context Clarification to Enhance Patient Choice Awareness

Significant variation existed across SDM behaviors. Clarifying the decision context is the essential first step, yet physicians frequently overlooked it. Survey results showed lowest participation in "explicitly stating a joint decision is needed." Cluster analysis revealed that the Informed Consent and Partial Patient Participation groups focused primarily on information provision with low decision awareness creation. Qualitative findings corroborated this: physicians typically initiated discussions through questioning or information delivery, neglecting to establish the decision context, thereby limiting patients' awareness of their participation rights and opportunities for bidirectional communication. This aligns with Visser et al. [14] and a systematic review [15] showing that creating decision awareness is commonly missed, forfeiting opportunities for SDM and hindering communication. Kunneman et al. [16] found that clarifying the decision context before traditional three-step processes (information exchange, deliberation, decision implementation) enhances patient participation. There-

fore, cultivating physicians' awareness to provide choices and assessing its link to actual patient participation can inform effective decision communication tools.

3.3 Emphasizing Objective Information Provision to Promote Full Patient Values Expression

Information provision includes presenting options and their risk-benefit profiles. Survey results showed highest participation in "explaining treatment options' advantages/disadvantages" and "informing patients about multiple options." All three cluster groups demonstrated high information provision participation. However, qualitative findings revealed that while physicians provided option information, some offered only one treatment or exhibited inducement when explaining risks/benefits, guiding patients toward preferred choices. This suggests physicians may dominate decision-making through information control, similar to Toerien et al.' s [17] conversation analysis showing clinicians frequently guide decision-making when presenting options or explaining risks. Framing option ranges or preferentially explaining benefits does not represent genuine choice or full patient values expression. Raphael et al. [18] found that information quantity depends on providers, and despite clinicians believing treatment burden is important in breast cancer chemotherapy decisions, few patients actually considered it. Visser et al. [14] noted clinicians often implicitly express treatment preferences as powerful recommendations patients cannot challenge. Miller et al. [19] also found physicians don' t fully share information and use persuasive strategies. Therefore, providers should understand patients' communication needs and concerns, provide options objectively, and use decision aids or question prompt lists to help patients clarify values, avoiding provider-framed information that biases patient choice.

3.4 Strengthening SDM Training to Open New Chapters in Physician-Patient Dialogue

Checking patient understanding is prerequisite for values clarification, yet survey results showed low participation in "helping patients understand all information." Interviews revealed most physicians didn' t consciously verify comprehension, with some equating signed consent with understanding—similar to international findings [14] that most physicians rarely facilitate patient/family understanding, and most patients receive no written disease/treatment information. Values clarification and joint deliberation are also frequently neglected SDM elements. Survey results showed moderate participation in "asking patient preferences" but low participation in "jointly weighing pros/cons." Cluster analysis revealed that compared to the Informed Consent Group, the Partial Patient Participation Group considered patient values, while the Shared Decision-Making Group engaged in joint deliberation. Qualitative findings showed some physicians valued patient input and viewed the physician-patient relationship as a partnership, yet most used indirect methods (subtle probing, inference) to assess values, predicting participation willingness based on patient characteristics. This matches a

systematic review [20] showing physicians don' t directly ask about preferences, erroneously believing they can guess them without inquiry. Loh et al. [21] noted physicians assume patients lack decision capacity or willingness, emphasizing health problem explanation while neglecting option provision. Another mixed-methods study [22] found physicians explained treatment options well but rarely integrated patient values into decisions. However, what clinicians consider "best" may not be optimal for patients. For instance, Lim [23] found that in choosing between thoracotomy and thoracoscopy, two-thirds of thoracic surgery patients selected thoracoscopy despite 3% higher recurrence risk because it was less painful and more cosmetically acceptable.

Regarding decision-making, survey results showed low participation in "jointly selecting treatment options." Cluster analysis revealed the Shared Decision-Making Group had high overall participation, and qualitative findings showed some physicians viewed patients as equal partners, co-deciding and permitting deferred decisions—important elements of partnership. However, most believed final decisions should rest with patients/families, indicating poor joint decision-making performance, possibly due to unclear role perception or conceptual confusion between informed consent and SDM. Therefore, SDM training should clarify communication processes to enhance skills, knowledge, and attitudes, catalyzing SDM behaviors. Mature online resources like the Ottawa Decision Support Tutorial (ODST) and Shared Decision-Making Knowledge Translation website provide essential training for healthcare providers and patients, promoting SDM adoption. Domestic scholars should adapt these models, explore suitable training pathways, and leverage the Shared Decision-Making Group' s positive influence to improve communication quality and unlock harmonious physician-patient relationships.

4 Conclusion

In summary, physicians remain dominant in decision-making, performing well on behaviors ensuring informed consent rights but paying insufficient attention to patient participation in communication. SDM behaviors are implemented in limited fashion. Healthcare institutions should: (1) strengthen patient participation behaviors as basic physician responsibilities; and (2) target knowledge and attitudes to clarify SDM processes through scenario simulation and role-playing, deepening understanding and enhancing recognition of patients' decisional values to promote genuine SDM implementation. Limitations include the single tertiary hospital sample, which may limit representativeness. Future research should expand to different hospital levels and include multiple perspectives (physicians, patients, observers) to inform targeted SDM promotion strategies.

Author Contributions: Yang Linning and Zheng Hongying contributed to conceptualization, design, data collection, and interpretation. Yang Linning drafted the manuscript. Zheng Hongying and Xu Yurui supervised revisions. Yang Yan oversaw quality control and final approval, assuming overall respon-

sibility.

Conflict of Interest: None declared.

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Note: Figure translations are in progress. See original paper for figures.