


# Barriers and Stimulus in Shared Decision Making Among Aesthetic Dermatologists in China: Findings from a Cross-Sectional Study

Jing Fan<sup>1,2,\*</sup>, Shiyuan Li<sup>3,\*</sup>, Yan Qiang<sup>1,\*</sup>, Zhen Duan<sup>3</sup>, Albert Wu<sup>2</sup>, Ruiping Wang<sup>1-3</sup> 

<sup>1</sup>Clinical Research Center, Shanghai Skin Diseases Hospital, School of Medicine, Tongji University, Shanghai, People's Republic of China; <sup>2</sup>Bloomberg School of Public Health, University of Johns Hopkins, Baltimore, MD, USA; <sup>3</sup>School of Public Health, Shanghai University of Traditional Chinese Medicine, Shanghai, People's Republic of China

\*These authors contributed equally to this work

Correspondence: Ruiping Wang, Email w19830901@126.com

**Introduction:** Shared decision making (SDM) is a collaborative process involving both healthcare providers and patients in making medical decisions, which gains increasing prominence in healthcare practice. But evidence on the level of SDM in medical practice and barriers as well as stimulus during the SDM implementation among aesthetic dermatologists is limited in China.

**Methods:** From July to August 2023, 1938 dermatologists were recruited online in China. Data were collected through an electronic questionnaire covering: (1) demographic features; (2) SDM questionnaire physician version (SDM-Q-Doc); and (3) stimulus and barriers in SDM implementation. Logistic regression was applied to explore factors associated with SDM practice, barriers, and stimulus of SDM implementation, respectively.

**Results:** The 1938 dermatologists included 1329 females (68.6%), with an average age of 35 years. The total SDM score ranged from 0 to 45, with a median value of 40 (IQR: 35–44), and the median stimulus score and barriers scores were 28 (IQR: 24–32) and 19 (IQR: 13–26), respectively. The prevalence of good SDM was 27.2%, logistic regression indicated that female dermatologists (odds ratio, OR=1.21, 95% confidence interval, CI: 0.96–1.51), and dermatologists with more years of aesthetic practice had a higher proportion of good SDM practice (OR was 1.44 for 5–9 years, 1.58 for 10–15 years and 1.77 for over 15 years). Moreover, female dermatologists and dermatologists with higher education level and serviced in private settings had lower barrier scores; female dermatologists and dermatologists with more years of aesthetic practice had higher stimulus scores.

**Conclusion:** Chinese aesthetic dermatologists appear to implement SDM at an active level, with more stimulus and less barriers in SDM implementation. The integration of SDM into clinical practice among dermatologists is beneficial both for patients and dermatologists. Moreover, SDM practice should be strongly promoted and enhanced during medical aesthetics, especially among male dermatologists, dermatologists with less working experience, and those who work at public institutions.

**Keywords:** shared decision making, dermatologist, good practice, barriers, stimulus

## Introduction

Shared decision making (SDM) has gained increasing prominence in healthcare practice with the rising recognition of patient-centered care in past decades.<sup>1-3</sup> It involves a collaborative process where healthcare providers and patients make a medical decision together.<sup>4</sup> The clinician provides information on treatment options, benefits, and risks, while the patient provides information about their preference and treatment goals. Besides achieving an agreement aligned with patient's value, SDM is also equally critical to offer comfort and support to the family or surrogate as an essential aspect of shared decision making.<sup>5</sup> Constantly, patients highlight the communication with the healthcare providers as being one of their most important concerns, with the majority of the patient's family members or surrogates expressing a desire for both themselves and physicians to be actively involved in the medical decision-making process.<sup>6,7</sup> SDM implementation

could increase patients' quality of life, and patients who experience higher levels of SDM participation have better reported health outcomes and decreased healthcare utilization.<sup>7</sup>

Medical aesthetics has been experiencing substantial growth in China since the 1980s due to the cultural attitudes toward beauty, societal pressures, and the growing demand for cosmetic procedures, with a Compound Annual Growth Rate (CAGR) ranging from 17% to 23% in the past 5 years.<sup>8</sup> The overall medical aesthetic market is expected to reach a valuation of \$50 billion by 2026. It is worth noting that medical aesthetic industry in China comprises more than 10,000 facilities, including hospitals, outpatient centers, and clinics, all regulated by the China Healthcare Commission. The aim of medical aesthetic intervention is to enhance an individual's overall appearance and well-being, with procedures typically driven by the patient's desires rather than medical necessity, and the subjective nature of beauty standards, potential psychological implications of aesthetic procedures, and ethical considerations could also influence the decision-making dynamics, all of which demonstrates the significant value of SDM for the selection of treatment options in medical aesthetics.<sup>9–11</sup> However, evidence demonstrating whether SDM is universally applied or not is not yet understood and studied in China.<sup>12,13</sup>

Previous studies indicated that Chinese physicians perceived SDM with high willingness (78.38%) based on the discrete-choice experiment (DCE) survey and the SDM questionnaire physician version (SDM-Q-Doc) survey.<sup>14</sup> However, studies focusing on SDM in the areas of medicine aesthetic or aesthetic surgery are still lacking, especially with the rising medical aesthetic demands in China. Moreover, Koyama et al<sup>4</sup> stated that factors that promote or hinder SDM implementation might be modified by the specific type of hospital where the physicians work. In China, the three main types of clinical institutions are distinctly regulated by various healthcare regulations, they exhibit distinctions at various aspects, encompassing service scope, level of service complexity, area size and service room setting, and number and specialty of healthcare providers. Besides, dermatologists working in public or private institutions encounter distinct leadership dynamics, organizational cultures, revenue structure, and patient expectations. Such differences may strengthen or weaken the SDM implementation upon the institution type. Unfortunately, there is a notable absence of the level of SDM in medical practice among aesthetic dermatologists, and also the comparative studies focusing on the aforementioned research line in China.

In this study, we implemented a cross-sectional survey to investigate the medical decision-making practice, the barriers, and stimulus during medical encounters among aesthetic dermatologists. Besides, to further explore the potential influencing factors associated with a good SDM practice among Chinese aesthetic dermatologists.

## Methods

### Study Design

During July and August 2023, we conducted this cross-sectional survey among Chinese dermatologists online at Umer Doctor APP (Shanghai Maise Information Technology Co., Ltd). Sample size was calculated based on the formula  $n = \left[ \frac{\mu^2}{\alpha/2} * p(1 - p) \right] / \delta^2$  for the cross-sectional study, we set the proportion of aesthetic dermatologists with good SDM practice (those achieving over 80% of SDM scores) as 50%,  $\alpha=0.05$ ,  $\delta=5\%$  of  $p$ , and a non-response rate of 15%, so a total of 1767 aesthetic dermatologists should be recruited. In this study, the aesthetic dermatologist was a convenience sample selected online at Umer Doctor APP, and data for SDM were collected from the spontaneous response among dermatologists with digital informed consent. In this study, 1938 aesthetic dermatologists whose practice license is active in China mainland and practices medical aesthetics with no less than 12 months experience completed the interview and are included in the final data analysis. This study was reviewed and approved by the Institutional Review Board of Shanghai Skin Diseases Hospital, Medical School, Tongji University (2022–31), and was in line with the Helsinki Declaration.

### Data Collection

In this study, data were collected through electronic questionnaire on Umer Doctor APP. The online questionnaire covered four parts: (1) demographic features including age, sex, education, professional qualification, institution type, private or public institutions, and years of practice in medical aesthetics; (2) SDM-Q-Doc,<sup>14</sup> which consists of nine questions, and the response to each items was assessed through a six-point Likert scale with 0=completely disagree, 1=strongly disagree, 2=somewhat disagree, 3=somewhat agree, 4=strongly agree, and 5=completely agree – the total SDM score is the

aggregation of responses to the 9 questions, which ranges from 0 to 45 with a higher score indicating the most active level of SDM implementation in medical encounters; (3) barriers for SDM implementation includes eight questions, the response to each item was assessed through a five-point Likert scale with 1=completely disagree and 5= completely agree – the total score of barriers is an aggregation of responses to the 8 questions, which ranges from 0 to 40 with a higher score indicating more barriers in SDM implementation; and (4) stimulus for SDM implementation consists of seven questions, and the response to each item was also assessed through a five-point Likert scale with 1= completely disagree and 5=completely agree – the total score of stimulus ranges from 0 to 35 with a higher score indicating more stimulus in SDM implementation.

## Index Definition

In this study, good SDM practice among aesthetic dermatologists is defined as those who achieved  $\geq 44$  score out of the total 45 score based on SDM-Q-Doc, which was the 75th percentile value of SDM score. Similarly, we define a higher barrier score as those who achieved  $\geq 26$  score out of the total 50 score based on their responses to barriers in SDM implementation, and define a higher stimulus score as those who achieved  $\geq 32$  score out of the total 35 score based on their responses to stimulus in SDM implementation. In this study, age is classified into  $<30$  years, 30–39 years, 40–49 years and  $>50$  years. Education splits into four groups of college and lower, graduate, master's, and doctor/post-doctor. Professional qualification consists of resident, attending physician, associated chief physician, and chief physician. Institution type refers to the groups of general hospital, specialized hospital, outpatient center, and clinics. Years of aesthetic practice is divided into  $<5$  years, 5–9 years, 10–15 years, and  $>15$  years. Healthcare setting is classified into public institutions and private institutions.

## Data Analysis

In this study, SAS 9.4 was employed for data analysis. Quantitative variables are presented as the mean and standard deviation (SD) or median and interquartile range (IQR) as appropriate. We applied Student's *t*-test or Mann–Whitney *U*-tests to examine the difference between groups for quantitative variables. Qualitative variables were described as frequency counts and proportion (%), and the chi-square test was used for statistical significance testing between groups. The odds ratio (OR) and 95% confidence interval (95% CI) were calculated to explore factors associated with good SDM practice, barriers of SDM implementation, and stimulus of SDM implementation, respectively. The box plot was produced to show the distribution of the SDM practice score, the barrier score, and the stimulus score of SDM implementation, and the scatter plot was produced to show the correlation between them. Moreover, the forest tree plot was produced to show potential influencing factors associated with the good SDM practice, barriers of SDM implementation, and stimulus of SDM implementation based on logistic regression, respectively. In this study, we set a *P* value less than 0.05 as statistically significant.

## Results

In this study, the median age of the 1938 aesthetic dermatologists was 35 years (IQR: 30–40 years). Approximately 68% of dermatologists were female and 42% of them had master's and above education. In this study, fewer than 20% of the dermatologists were chief physician or associated chief physician, 59% of them worked in the general hospital, and fewer than 40% of the dermatologists worked in the private institutions. The median years of aesthetic practice was 5 years (IQR: 3–10 years). Table 1 indicates that male dermatologists were older than female dermatologists, had a higher proportion of master's and above education, had a higher proportion of being chief physician or associated chief physician, with longer years of aesthetic practice, but a lower proportion of servicing in a general hospital than female dermatologists; the differences were all statistically significant ( $P<0.05$ ) (Table 1).

## SDM Scores and Scores for Barrier and Stimulus in SDM Implementation

In this study, SDM implementation among aesthetic dermatologists was evaluated based on the SDM-Q-Doc with 9 questions. Table 2 indicates that the proportion of completely agree (score 5) responses among dermatologists ranged from 40.3% to 57.2%, and the proportion of completely disagree (score 0) responses ranged from 0.1% to 0.4%. The total SDM score ranged from 0 to 45, with a median value of 40 score (IQR: 35–44) (Table 2, Figure 1).

**Table 1** Demographic Features of 1938 Dermatologists Who Practice Medical Aesthetics in China

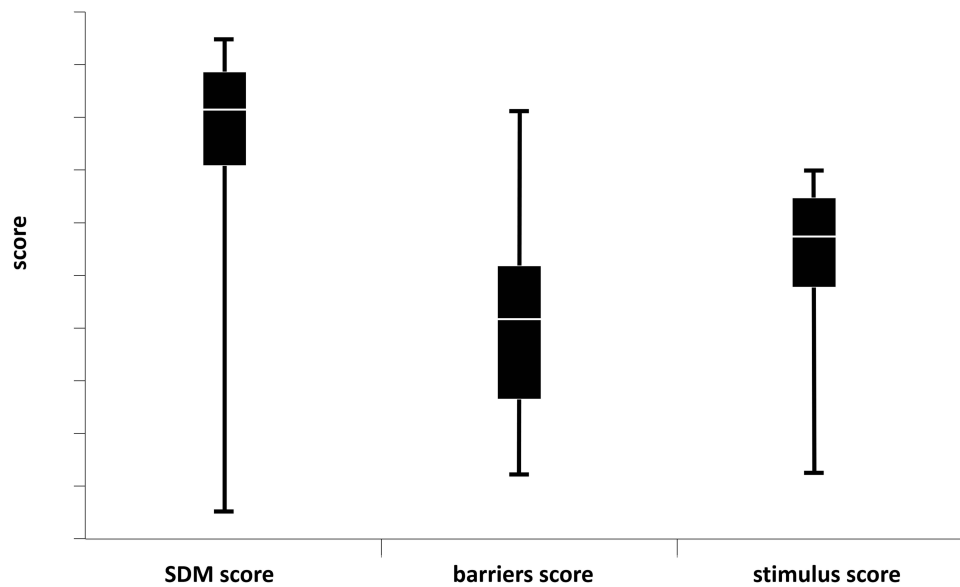
Variables	Dermatologist (n=1938)	Male Dermatologist (n=609)	Female Dermatologist (n=1329)	$z/\chi^2$	P
Age (years), (median, IQR)	35.0 (30.0–41.0)	38.0 (32.0–45.0)	34.0 (30.0–40.0)	8.051	0.000
Age (years), n (%)				58.851	0.000
<30	395 (20.4)	83 (13.6)	312 (23.5)		
30–39	898 (46.3)	256 (42.0)	642 (48.3)		
40–49	482 (24.9)	192 (31.5)	290 (21.8)		
≥50	163 (8.4)	78 (12.8)	85 (6.4)		
Education, n (%)				16.502	0.000
College and lower	144 (7.4)	55 (9.0)	89 (6.7)		
Graduate	984 (50.8)	348 (57.1)	636 (47.9)		
Master's	749 (38.7)	184 (30.2)	565 (42.5)		
Doctor/Ph.D/Post-doctor	61 (3.2)	22 (3.6)	39 (2.9)		
Professional qualification, n (%)				13.532	0.000
Resident	733 (37.8)	194 (31.9)	539 (40.6)		
Attending physician	834 (43.0)	274 (45.0)	560 (42.1)		
Associated chief physician	286 (14.8)	113 (18.6)	173 (13.0)		
Chief physician	85 (4.4)	28 (4.6)	57 (4.3)		
Type of healthcare setting, n (%)				8.292	0.041
General hospital	1148 (59.2)	338 (55.5)	810 (60.9)		
Specialized hospital	283 (14.6)	86 (14.1)	197 (14.8)		
Ambulatory center	268 (13.8)	97 (15.9)	171 (12.9)		
Clinics	239 (12.3)	88 (14.5)	151 (11.4)		
Aesthetic practice years, (median, IQR)	5.0 (3.0–10.0)	5.0 (3.0–10.0)	5.0 (2.0–9.0)	4.147	0.001
Aesthetic practice years, n (%)				17.991	0.000
<5 years	855 (44.1)	229 (37.6)	626 (47.1)		
5–9 years	576 (29.7)	190 (31.2)	386 (29.0)		
10–15 years	302 (15.6)	111 (18.2)	191 (14.4)		
>15 years	205 (10.6)	79 (12.9)	126 (9.5)		
Healthcare setting ownership, n (%)				5.016	0.025
Public institution	1166 (60.2)	344 (56.5)	822 (61.9)		
Private institution	772 (39.8)	265 (43.5)	507 (38.1)		

**Abbreviation:** IQR, interquartile range.

**Table 2** The Total Shared Decision Making (SDM) Score Based on SDM-Q-Doc Among the 1938 Dermatologists Who Practice Medical Aesthetics in China

Nine questions for Shared Decision Making (SDM)-Q-Doc	Responses Among Dermatologists who Practice Medical Aesthetic, n (%) [Completely Disagree (0) to Completely Agree (5)]					
	Score 0	Score 1	Score 2	Score 3	Score 4	Score 5
I made clear to my patient that a decision needs to be made	21 (1.1)	53 (2.7)	141 (7.3)	417 (21.5)	526 (27.1)	780 (40.3)
I wanted to know exactly from my patient how he/she wants to be involved in making the decision	2 (0.1)	16 (0.8)	68 (3.5)	353 (18.2)	600 (31.0)	899 (46.4)
I told my patient that there are different options for treating his/her medical condition	2 (0.1)	6 (0.3)	61 (3.2)	247 (12.8)	526 (27.1)	1096 (56.6)
I precisely explained the advantage and disadvantage of the treatment options to my patient	3 (0.2)	8 (0.4)	49 (2.5)	232 (11.9)	538 (27.8)	1108 (57.2)
I helped my patient understand all the information	2 (0.1)	9 (0.5)	47 (2.4)	342 (17.7)	646 (33.3)	892 (46.0)
I asked my patient which treatment option he/she prefers	7 (0.4)	12 (0.6)	44 (2.3)	262 (13.5)	558 (28.8)	1055 (54.4)
My patient and I thoroughly weighted the different treatment options	5 (0.3)	21 (1.1)	55 (2.8)	338 (17.4)	581 (30.0)	938 (48.4)
My patient and I selected a treatment option together	5 (0.3)	16 (0.8)	58 (3.0)	280 (14.5)	542 (27.9)	1037 (53.5)
My patient and I reached an agreement on how to proceed	8 (0.4)	12 (0.6)	44 (2.3)	268 (13.8)	565 (29.2)	1041 (53.7)

**Notes:** Completely disagree (score 0); strongly disagree (score 1); somewhat disagree (score 2); somewhat agree (score 3); strongly agree (score 4); completely agree (score 5). Adapted from Martin Härter & Isabelle Scholl, University Medical Center Hamburg-Eppendorf, Germany. Creative Commons.



**Figure 1** The score of shared decision making (SDM), score of barriers for SDM implementation, and score of stimulus for SDM implementation among 1938 dermatologists who practice medical aesthetics in China.

Table 3 indicates the scores for barriers in SDM implementation. The proportion of completely disagree (score 1) responses to the eight questions ranged from 22.9% to 52.1%, and the proportion of completely agree (score 5) ranged from 10.3% to 16.1%. The total score of barriers in SDM implementation ranged from 7 to 40, with a median value of 19 score (IQR: 13–26). Table 3 also indicates the scores for stimulus in SDM implementation. The proportion of completely disagree (score 1) responses to the seven questions ranged from 1.1% to 15.9%, and the proportion of completely agree (score 5) ranged from 28.6% to 47.6%. The total score of stimulus in SDM implementation ranged from 7 to 35, with a median value of 28 score (IQR: 24–32) (Table 3, Figure 1).

**Table 3** The Barriers and Stimulus for Shared Decision Making (SDM) Implementation Among the 1938 Dermatologists Who Practice Medical Aesthetics in China

Variables	Responses Among Dermatologists who practice Medical Aesthetic, n (%) [Completely Disagree (1) to Completely Agree (5)]				
	Score 1	Score 2	Score 3	Score 4	Score 5
<b>Barriers for SDM implementation among dermatologists who practice medical aesthetics</b>					
Patients subjectively do not want to participate in clinical diagnosis and treatment decisions	445 (22.9)	323 (16.7)	527 (27.2)	332 (17.1)	311 (16.1)
I do not know what is “Shared Decision Making”	774 (40.0)	337 (17.4)	389 (20.1)	225 (11.6)	213 (11.0)
I lack the specific experience in conducting “Shared Decision Making” implementation	592 (30.6)	344 (17.8)	473 (24.4)	277 (14.3)	252 (13.0)
I do not have enough time to implement “Shared Decision Making” implementation	512 (26.4)	346 (17.9)	514 (26.5)	310 (16.0)	256 (13.2)
The medical environment is too noisy to carry out “Shared Decision Making”	564 (29.1)	384 (19.8)	459 (23.7)	263 (13.6)	268 (13.8)
“Shared Decision Making” is not necessary for me to carry out clinical work	1009 (52.1)	311 (16.1)	260 (13.4)	159 (8.2)	199 (10.3)
No guidelines or literature promoting the application of “Shared Decision Making”	591 (30.5)	340 (17.5)	479 (24.7)	274 (14.1)	254 (13.1)
“Shared Decision Making” between doctors and patients increases the risk of medical responsibility	808 (41.7)	310 (16.0)	411 (21.2)	198 (10.2)	211 (10.9)
<b>Stimulus for SDM implementation among dermatologists who practice medical aesthetics</b>					
Subjectively, patients wish to participate in clinical diagnosis and treatment decisions	22 (1.1)	76 (3.9)	390 (20.1)	598 (30.9)	852 (43.9)
I have enough time to implement “Shared Decision Making” implementation	74 (3.8)	233 (12.0)	566 (29.2)	486 (25.1)	579 (29.9)
Some specific patients are more suitable for conducting “Shared Decision Making (SDM)”	12 (0.6)	50 (2.6)	368 (19.0)	603 (31.1)	905 (46.7)
Conducting SDM can improve my communication efficiency in diagnosis and treatment	15 (0.8)	73 (3.8)	377 (19.5)	604 (31.2)	869 (44.8)
Implementing “Shared Decision Making” can improve the treatment outcomes of patients	17 (0.9)	56 (2.9)	350 (18.1)	592 (30.6)	923 (47.6)
Medical institutions support doctors in carrying out “Shared Decision Making”	65 (3.4)	131 (6.8)	461 (23.8)	550 (28.4)	731 (37.7)
“Shared Decision Making” training program designed specifically for doctors	308 (15.9)	237 (12.2)	446 (23.0)	392 (20.2)	555 (28.6)

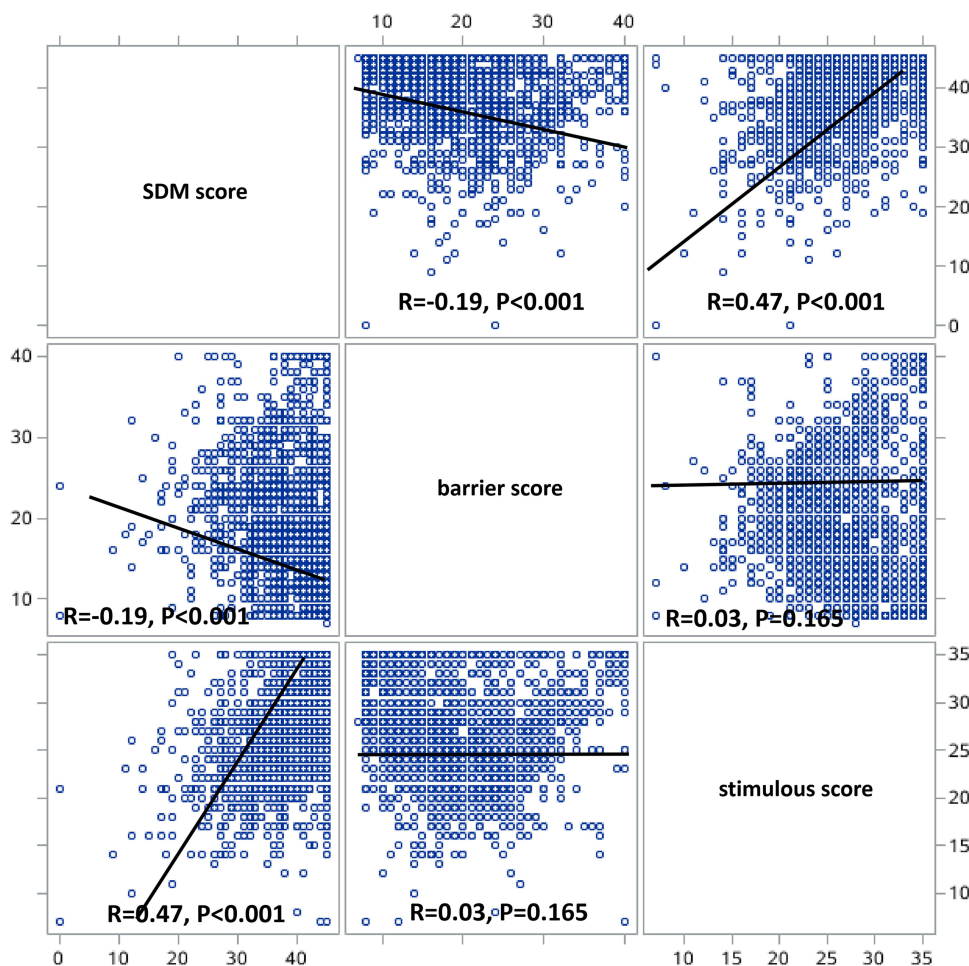
**Notes:** Completely disagree (score 1); strongly disagree (score 2); neutrality (score 3); strongly agree (score 4); completely agree (score 5).

Figure 2 depicts the correlation between SDM score and score of barrier as well as scores of stimulus during SDM implementation. The SDM score of dermatologists was positively correlated with their stimulus score ( $r=0.47$ ,  $P<0.001$ ), and was negatively correlated with their barrier score ( $r=-0.19$ ,  $P<0.001$ ). Whereas the correlation between the barrier score and the stimulus score among dermatologists was not statistically significant ( $r=0.03$ ,  $P=0.165$ ) (Figure 2).

## Factors Associated with Good SDM Practice

In this study, 528 out of 1938 dermatologists achieved  $\geq 44$  scores based on the SDM-Q-Doc, the proportion of good SDM practice was 27.2% (95% CI: 25.3–29.3%). The chi-square test indicated that aesthetic dermatologists with older age had a higher proportion of good SDM practice, and the proportion of good SDM practice was higher among dermatologists with higher professional qualification, with more years of aesthetic practice, and those serving in private institutions and working in ambulatory centers and clinics (Table 4).

The logistic regression indicated that female dermatologists had higher proportion of good SDM practice (OR=1.21, 95% CI: 0.96–1.51) than male dermatologists. Dermatologists with more years of aesthetic practice had higher proportion of good SDM practice, the OR was 1.44 (95% CI: 1.11–1.88) for those with 5–9 years, 1.58 (95% CI: 1.14–2.21) for those with 10–15 years, and 1.77 (95% CI: 1.17–2.67) for those with over 15 years, in comparison with those with less than 5 years of aesthetic practice. Dermatologists serviced in ambulatory center (OR=1.15, 95%: 0.80–1.66) and clinics (OR=1.29, 95%: 0.88–1.89) also tended to have higher proportion of good SDM practice, but without statistical significance (Figure 3).



**Figure 2** The correlation between shared decision making (SDM) score, score of barriers for SDM implementation, and score of stimulus for SDM implementation among 1938 dermatologists who practice medical aesthetics in China.

**Table 4** The Influencing Factors for Those Achieved Higher Shared Decision Making (SDM) Score, Score of Barriers for SDM Implementation, and Score of Stimulus for SDM Implementation Among 1938 Dermatologists Who Practice Medical Aesthetics in China

Variables	Model 1		Model 2		Model 3	
	OR	95% CI	OR	95% CI	OR	95% CI
Gender <sup>†</sup>						
Male	1.00		1.00		1.00	
Female	1.13	0.95–1.34	0.73	0.59–0.90	1.21	0.97–1.50
Age (years) <sup>‡§</sup>						
<30	1.00		1.00		1.00	
30–39	1.22	0.98–1.51	0.83	0.64–1.09	0.82	0.62–1.07
40–49	1.30	1.03–1.66	0.99	0.73–1.33	1.23	0.92–1.64
≥50	2.00	1.44–2.78	1.01	0.67–1.52	1.63	1.12–2.40
Education <sup>†‡§</sup>						
College and lower	1.00		1.00		1.00	
Graduate	0.76	0.56–1.04	0.72	0.49–1.03	0.64	0.45–0.91
Master's	0.68	0.50–0.94	0.44	0.30–0.65	0.45	0.31–0.66
Doctor/Ph.D/Post-doctor	0.66	0.39–1.13	0.54	0.27–1.08	0.44	0.22–0.88
Aesthetic practice years <sup>†‡§</sup>						
<5 years	1.00		1.00		1.00	
5–9 years	1.59	1.31–1.92	0.86	0.67–1.11	1.17	0.92–1.49
10–15 years	1.66	1.31–2.08	1.30	0.97–1.75	1.34	1.00–1.79
>15 years	1.83	1.39–2.41	1.33	0.95–1.86	2.52	1.83–3.45
Professional qualification						
Resident	1.00		1.00		1.00	
Attending physician	1.18	0.98–1.40	0.80	0.64–1.01	0.93	0.75–1.17
Associated chief physician	1.23	0.96–1.57	1.12	0.83–1.52	1.04	0.76–1.40
Chief physician	1.94	1.30–2.91	0.84	0.50–1.43	1.72	1.08–2.73
Healthcare setting ownership <sup>‡§</sup>						
Public institution	1.00		1.00		1.00	
Private institution	1.23	1.04–1.45	0.98	0.80–1.21	1.46	1.19–1.78
Type of healthcare setting <sup>‡§</sup>						
General hospital	1.00		1.00		1.00	
Specialized hospital	1.06	0.84–1.34	0.82	0.60–1.13	1.20	0.90–1.60
Ambulatory center	1.29	1.01–1.63	1.25	0.93–1.68	1.70	1.28–2.26
Clinics	1.37	1.07–1.76	1.03	0.75–1.42	1.62	1.20–2.18

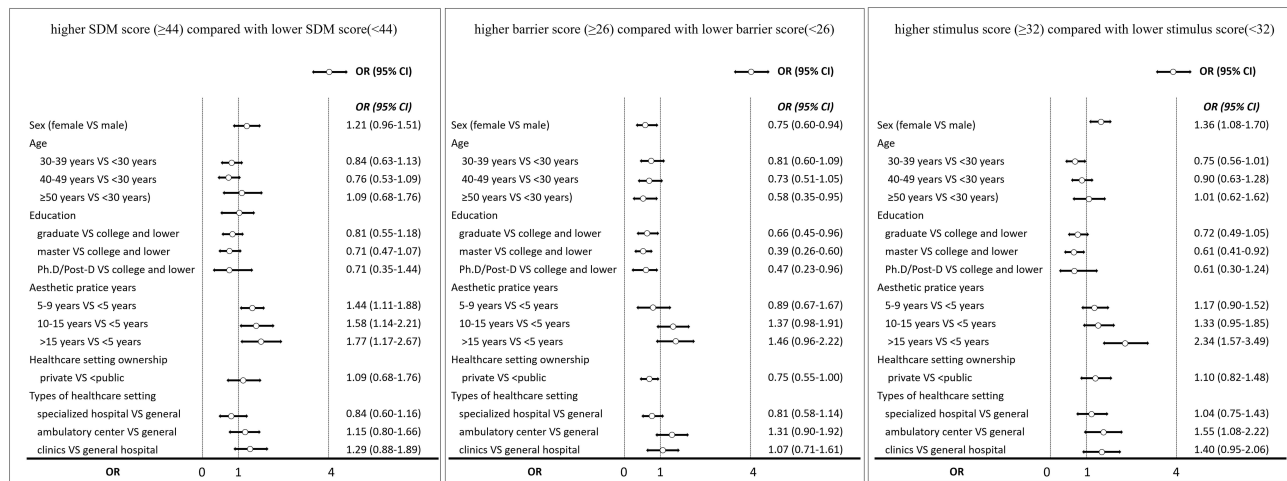
**Notes:** <sup>‡</sup>The difference for SDM scores between groups was statistically significant ( $P<0.05$ ). <sup>†</sup>The difference for SDM implementation barrier scores between groups was statistically significant ( $P<0.05$ ). <sup>§</sup>The difference for SDM implementation stimulus scores between groups was statistically significant ( $P<0.05$ ). Model 1: Univariate logistic regression for factors associated with dermatologists with higher SDM scores ( $\geq 44$ ). Model 2: Univariate logistic regression for factors associated with dermatologists with higher barrier scores ( $\geq 26$ ) for SDM implementation. Model 3: Univariate logistic regression for factors associated with dermatologists with higher stimulus scores ( $\geq 32$ ) for SDM implementation.

**Abbreviations:** OR, odds ratio; CI, confidence interval.

## Factors Associated with the Barriers During SDM Implementation

In this study, 488 dermatologists achieved  $\geq 26$  scores in the evaluation of barriers in SDM implementation, the proportion of dermatologists with higher barrier score was 25.2% (95% CI: 23.3%–27.1%). Chi-square test indicated that female dermatologists had lower proportion of having a higher barrier score than male dermatologists. Moreover, dermatologists with higher education or with less aesthetic practice years were prone to have a lower proportion of achieving higher barrier score (Table 4).

Logistic regression indicated that female dermatologists had lower proportion of achieving higher barrier score (OR=0.75, 95% CI: 0.60–0.94) than male dermatologists. Dermatologists with older age and less aesthetic practice years tended to have lower barrier scores, but without statistical significance. In comparison with dermatologists with college



**Figure 3** The influencing factors for those who achieved higher score of shared decision making (SDM), score of barriers for SDM implementation, and score of stimulus for SDM implementation among the 1938 dermatologists who practice medical aesthetics in China, an analysis based on multivariate logistic regression (MLR).

and lower education, dermatologists with higher education level tended to have lower proportion of achieving higher barrier scores, the OR was 0.66 (95% CI: 0.45–0.96) for those with graduate, 0.39 (95% CI: 0.26–0.60) for those with master's, and 0.47 (95% CI: 0.23–0.96) for those with Ph.D/Post-D education. Moreover, dermatologists serviced in private settings (OR=0.75, 95%: 0.55–1.00) also had lower proportion of achieving higher barrier scores (Figure 3).

### Factors Associated with the Stimulus in SDM Implementation

In this study, 543 dermatologists achieved ≥32 scores in the evaluation of stimulus in SDM implementation, the proportion was 28.0% (95% CI: 26.1–30.0%). Chi-square test indicated that dermatologists with older age had higher proportion of achieving a higher stimulus score, and the proportion of higher stimulus score was higher among dermatologists with more years of aesthetic practice, those serving in private institutions and working in clinics, ambulatory centers, and specialized hospital (Table 4).

Logistic regression indicated that female dermatologists had higher proportion of achieving higher stimulus score (OR=1.36, 95% CI: 1.08–1.70) than male dermatologists. Dermatologists with more aesthetic practice years also had higher stimulus score; the OR was 1.17 (95% CI: 0.90–1.52) for those with 5–9 years, 1.33 (95% CI: 0.95–1.85) for those with 10–15 years, and 2.34 (95% CI: 1.57–3.49) for those with over 15 years, in comparison with those with less than 5 years of aesthetic practice (Figure 3).

### Discussion

To our knowledge, this is the first study in China to explore the SDM implementation among aesthetic dermatologists and its associated barriers and stimulus in SDM practice. The findings indicated that Chinese dermatologists had high perception on SDM during their aesthetic practice, and female dermatologists, dermatologists with longer aesthetic practice years, and serving in ambulatory centers and clinics had higher SDM scores. In addition, the SDM scores was positive associated with the stimulus score, but negatively associated with the barrier score. The gender, education level, and aesthetic practice years were associated with the stimulus score as well as the barrier score among the aesthetic dermatologists.

The SDM-Q-Doc is primarily developed as a psychometrically tested instrument to evaluate the SDM process among physicians.<sup>15</sup> Considering its broadly tested psychometrics and multiple language availability, the SDM-Q-Doc appears to be the prioritized approach to measure the decision-making process from physician perspective. Therefore, the SDM implementation among dermatologists was assessed through the 9-item SDM-Q-Doc in this study, which covered: (1) recognizing the need for a decision; (2) establishing an equal partnership; (3) outlining treatment alternatives; (4) providing details on the advantages and drawbacks of options; (5) assessing the patient’s comprehension and

expectations; (6) pinpointing preferences of both parties; (7) engaging in negotiation; (8) achieving a mutual decision; and (9) organizing follow-up procedures.<sup>16–18</sup>

In this study, most of the dermatologists reported to have a high-level implementation of SDM during the clinical practice. The median SDM sum score was 88.9 after standardizing the raw score (median value was 40) by a linear transformation to convert the score into a scale ranging from 0 to 100, which demonstrates Chinese dermatologists situate a decent level in implementing SDM, and the finding was in line with previous studies.<sup>4,14</sup> A cross-sectional study implemented in Japan showed that the mean SDM score was 76.9 among 129 physicians who worked at university hospital and municipal hospitals.<sup>4</sup> Another Chinese SDM study regarding lung cancer treatment also indicated that the mean SDM score was 85.4 among 185 physicians.<sup>14,19</sup> Meanwhile, It is also worth noting that the high level of self-reported SDM implementation could be partially due to the overestimation of SDM competencies among aesthetic dermatologists in this study. The reasoning is supported by a review which indicated that the actual decision-making behavior appeared to be rather paternalistic, although most physicians had positive attitudes toward SDM.<sup>20</sup>

Apparently, the extent to which physicians use SDM in practice is influenced by individual factors.<sup>21</sup> In this study, we noticed that female dermatologists tend to have higher SDM score than male dermatologists during their SDM practices. Meanwhile, the stimulus scores during SDM implementation were also higher among female dermatologists. The finding regarding sex aligns with previous research indicating that female dermatologists exhibit more favorable SDM behavior compared to their male counterparts.<sup>22</sup> In instances where SDM was more effectively employed by female dermatologists, it encompassed aspects such as assisting patients in comprehending technical information, elucidating the benefits and risks of treatment options, and engaging in a comprehensive evaluation before collectively deciding on the preferred treatment option.

Apart from sex, the results for age suggested consistency with the previous studies stressing that age is a vital factor for SDM practice.<sup>23</sup> In this study, dermatologists with older age tended to have higher SDM scores and stimulus scores, but lower barriers scores. Compared to dermatologists older than 50 years who showed strong preference on SDM implementation, the findings indicated that the preferences of SDM implementation were similarly lower among dermatologists aged 30–39, 40–49, and below 30 years. The findings further confirmed that aesthetic dermatologists below age 50 years hold same preferences to implement SDM; this was partially aligned with a study that demonstrating age was an essential factor for SDM practice,<sup>24</sup> and this might due to the fact that younger dermatologists had more workloads than older dermatologists in China, and they had limited time to implement SDM in their clinical practice. So it worth further research with rigorous design like a prospective cohort to evaluate the effect of age on SDM implementation.

Regarding the years of aesthetic practice, working experience plays an essential role in the career. In this study, aesthetic dermatologists practicing 5 years and more would behave better in SDM and had higher stimulus score during SDM implementation compared to those practicing less than 5 years, and the group with aesthetic practice over 15 years have the strongest preferences. The results held the same points with a study which demonstrated that years of working experience positively relates to the behavioral change outcomes.<sup>25</sup> Rooting the current situation in China, the reason could be that dermatologists with aesthetic practice more than 15 years normally enjoy a great reputation in the industry and are easier to gain trust from patient to adopt shared decision-making practice. For younger physicians, they have less experience and are motivated to serve more patients to build their reputation and trust with the patients, so younger dermatologists have lower participation in SDM practice even with strong willingness. Interestingly, dermatologists with longer years of aesthetic practice in this study also reported more barriers in SDM implementation than those with less aesthetic practice years, and this might be due to that dermatologists with longer aesthetic practice years had higher expectation in SDM implementation to provide better service for their patients. But the true reason needs to be explored by in-depth interview in the future.

Previous studies indicate that the intention to engage in SDM among physicians varies between settings and disciplines.<sup>26,27</sup> In this study, dermatologists who served at private healthcare settings had higher SDM score and stimulus score, but had lower barrier score in SDM implementation than those who served at public healthcare settings. The results for institution type are in alignment with the previous studies that the type of care provided by different institutions would influence the extent to which dermatologists and patients actually participate in decision-making.<sup>28,29</sup> For medical aesthetic

practice in China, dermatologists who work at private institutions have more time to encounter each patient, as they see less number of patients per day than those from public institutions due to very different patient daily traffic; moreover, dermatologists in private institutions mainly see patients who seek aesthetics treatment only, while public dermatologists see patients with higher complexity but less proportion of aesthetics, and this helps understand the ground of why private practice adopts SDM more.

In this study, the Chinese aesthetic dermatologists implement SDM at an active level, with more stimulus and less barriers in SDM implementation. Whereas dermatologists still reported some barriers in SDM practice, which including the limited ability to participate among patients, the extra time need for SDM, and noisy and busy hospital settings. As depicted in a review study by Gravel et al,<sup>30</sup> the most important obstacles to implementing SDM were time constraints, features of patients, and clinical settings, which was in line with the findings in this study. Therefore, stakeholders and dermatologists as well should provide assistance for patients to improve their involvement in SDM practice.<sup>31</sup> Moreover, the incorporation of SDM into health policy objectives and instruments is also important for SDM implementation, and SDM could be promoted by training programs or educational initiatives focused on SDM skills resource development and funding streams, and providing techniques could also help standardize and improve SDM practice across diverse demographic and practice related groups.<sup>32</sup>

This study has some limitations. First, data were collected through spontaneous response among dermatologists through online investigation, which is regarded as convenience sampling, and may weaken the representativeness of this study and could not represent all aesthetic dermatologists in China. Also, dermatologists who are more positive to SDM maybe prone to respond to this survey, while those who do not know or are negative to SDM may not respond. Second, this study missed the patient component; previous studies showed that the involvement of patients' interaction provides a holistic understanding of SDM practice. But most of these studies were conducted in a small sample size, including a 50-physician survey conducted in Dubai<sup>33</sup> and a 66-provider survey conducted in Canada.<sup>34</sup> Given the sample size is approximately 2000 in this study, it is difficult to enroll the same number of patients to explore the interaction which is an inevitable challenge. Third, this study had information bias such as over-reporting; we measure the SDM implementation through self-reported questionnaires by the SDM-Q-DOC scale, and this may raise the possibility of respondents over-reporting their SDM implementation. Fourth, SDM implementation involves multiple stakeholders in healthcare systems, so it is important to consider the barriers and facilitators from multiple stakeholder perspectives to optimize the implementation effect. Whereas this study was only focused on the dermatologist's perspective, which is another limitation. So the incorporation of some improvement such as face-to-face interview, multiple stakeholders, and a patient component in future study could ensure the in-depth understanding of SDM practice in China.

## Conclusions

The integration of SDM into clinical practice among aesthetic dermatologists across various health disciplines worldwide is beneficial both for patients and dermatologists. Chinese aesthetics dermatologists appear to implement SDM at an active level, with more stimulus and less barriers in SDM implementation. Moreover, SDM practice should be strongly promoted and enhanced during medical aesthetics, especially among male dermatologists, junior dermatologists with less working experience, and among dermatologists who work at public institutions.

## Abbreviations

SDM, Shared Decision Making; CAGR, Compound Annual Growth Rate; DCE, Discrete-Choice Experiment; SDM-Q-Doc, SDM Questionnaire Doctor Version; SD, Standard Deviation; CI, Confidence Interval; OR, Odds Ratio.

## Data Sharing Statement

Data in this study can be made available upon request to the corresponding author.

## Ethics Approval and Consent to Participate

The study was reviewed and approved by the Review Board of Shanghai Skin Diseases Hospital of Tongji University (2022-31). Informed consent was signed online by each participant before the questionnaire interview.

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## Author Contributions

All authors in this paper made substantial contributions to conception and design, acquisition of data, or analysis and interpretation of data; took part in drafting the article or revising it critically for important intellectual content; agreed to submit to the current journal; gave final approval of the version to be published; and agree to be accountable for all aspects of the work.

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## Disclosure

The authors report no conflicts of interest in this work.

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