Relationship Between Decision Conflict and Decision Regret Among Postoperative Breast Cancer Patients in China: The Regulating Role of Decision-Making Preparation

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Research Article

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Abstract

Objective: Different surgical methods have different risks and benefits. The Chinese breast cancer(BC) patients' decision-making of surgical treatment become a critical research question. Patients are often offered several options before surgery, and decision preparation play an important role in decision process. However some patients regret the original decision afterward. To understand the current situation, this study explore mainly explores the status of decision regret among newly diagnosed BC patients, and tests the relationship between decision conflicts, decision-making preparation, and decision regrets.

Methods: A cross-sectional survey was conducted. Totally 320 postoperative BC patients were studied using a self-made general data scale, Decision Regret Scale, Decision Conflict Scale, and Preparation for Decision Making Scale. Basic descriptive analyses, Pearson's correlation analyses and regression analyses were performed.

Results: The average score of decision regret among BC patients after surgery was 34.28. Decision regret was positively associated with decision conflict ($r=0.853$, $p<0.01$), and negatively associated decision preparation ($r=-0.404$, $p<0.01$). Decision-making preparation plays a regulatory role for the emergence of decision conflicts and regrets. The correlation between decision conflicts and decision regrets increases with the increase of decision-making preparation.

Conclusion: The adverse effects of decision conflicts on decision regrets gradually increase with the increase of decision-making preparation. Results indicate that reducing decision preparation can be expected to improve the level of decision regret among Chinese BC patients. Thus, Clinical staffs should encourage patients to actively participate in decision-making, provide specialized information support, and improve the level of decision regret among Chinese BC patients after surgery.

Introduction

Breast cancer is the most common cancer in women worldwide. According to global cancer data in 2020, there are more than 2.26 million new cases of breast cancer each year, accounting for 11.7% of all tumors[1]. In China, the median age of diagnosis is 48-50 years old, and the 5-year survival rate has reached 85% to 88%[2]. Surgical treatment is one of the important methods for comprehensive treatment of breast cancer patients. The surgical decision-making is a complex and difficult progress for Chinese BC. Breast-conserving surgery and breast reconstruction have become milestones in surgical treatment. The rate of breast-conserving in USA was 64.5% [3,4] and the rate of breast reconstruction was 40%, however, The majority of BC patients in China are still dominated by mastectomy, and 20-40% chose breast-conserving and only 10.7% chose breast reconstruction [3,5]. Different surgical methods proved to have an impact on the quality of life[6]. Therefore, the Chinese BC patients' decision-making of surgical treatment become a critical research question.

In china, cancer is a family event. Facing with complicated treatment decisions, BC patients always require to weigh efficacy, safety, post-operation complications, cost, quality of life and follow-up treatment. A qualitative research have reveal the decision-making progress were influenced by many factors, such as financial burden, family factors, traditional culture and fatalism in china[7].When confronted with surgical decision, BC patients always experienced anxiety, illness uncertainty , depress, hesitation and decision conflict[8].Facing with many treatment options, BC patients experienced moods fluctuate and always given the decision-making right to physicians ,which just considered survival time and didn't consider patients' preference . A survey showed 6-23% of cancer patients experience decision regret[9]. Therefore, different surgical decision-making may contribute to different quality of life and body image.

Decision regrets is a measure of the quality of decision making. Regrets was often considered to be negative psychological and emotional feelings related with considering a past or future choice[9,10].Prior studies have shown that the active involvement in treatment decision can get more satisfaction about decision-making process^[11,12]. Influenced by traditional medical environment, more patient play a passive role in decision-making progress and tend to let the physicians or family members make treatment decision in China[7]. The decision regret associated with various factors including lack of treatment information, individual value, personality traits, decision conflict, decision attitudes and culture factors[13,14]. Berry et al.'s research has shown that if patients make decisions with insufficient participation, in the long run the probability of regret will increase and the quality of decision-making will decrease[15]. Share decision-making is the peak form of patient-centered care, which encourage patients actively participate in their own treatment decisions[16]. The surgical options is a challenging and perplexing process and largely depend on each patient's personal values and preferences. Even though some research conducted in other countries, little is known about the decision regret, influencing factor and mechanism among newly diagnosed BC patients in China.

This study mainly explores the status of decision regret among newly diagnosed BC patients,and tests the relationship between decision conflicts, decision preparation, and decision regrets. The hypothetical model is shown in Figure 1, which details treatment decisions for breast cancer patients. New information will provide a theoretical basis for improving patients' ability to make relevant decisions.

Methods

Participants

A convenient sampling method was used to recruit participants from the Breast Reconstruction Ward of the Tianjin Cancer Hospital from May to October in 2018. The inclusion criteria for selection included: (1)aged 18 years or older, (2)newly diagnosed as stage I-II BC, (3) undergone breast cancer surgery. Exclusion criteria included: (1) had other malignant tumors in the past, (3)have an additional serious cardiopulmonary dysfunction, (4)being cognitively impaired, and/or having a mental illness. A total of

320 women were enrolled and they all signed the informed consents. This study was approved by the Institutional Review Board of Tianjin Cancer Hospital, Tianjin, China.

Measures

The demographic questionnaire was self-designed by researcher to collect patients' demographic and clinical characteristics. The information collected was age, religious beliefs, occupational status, educational level, marital status, medical expenses, surgical decision-makers, and disease details.

Decision Regret

The Decision Regret Scale was developed by Brehaut [17] in 2003 to assess the level of regret of a patient's treatment-related decision after surgery. The scale consists of 5 items and each item was rated on a 5-point Likert scale, with 1 for complete agreement and 5 for complete disagreement. The scores of item is subtracted from the raw score and the result is multiplied by 25. The total (mean) scores range from 0 to 100, with a higher score indicating patient's more decision regret. The Chinese scale has good reliability and validity, with a Cronbach's α of 0.86 [18]. It has been widely used in breast cancer patients. The Cronbach's α coefficient in this study was 0.834.

Decision Conflict

The Decision Conflict Scale was used to assess the uncertainty about choices, factors that lead to decision conflicts, and perceptions of effective decision-making [19]. The study used Chinese version of Decision Conflict Scale by Li [20]. The scale consists of 16 items and 16 items are divided into 3 dimensions: decision uncertainty (3 items), factors leading to decision uncertainty (9 items), and perceived effectiveness of decisions (4 items). The scale uses the 5-point Likert scale from 0-4 (from strongly agree to strongly disagree). The total score ranges from 0-64. The converted total score firstly were summed all item scores, then was divided by 16 and multiplied by 25. The converted total scores range from 0 to 100, with a higher score indicating a higher level of decision conflict [21]. A total scores of less than 25 is considered as absence of a decision-making dilemma. More than 37.5 indicated the presence of a decision-making dilemma, which often delays decisions. The Chinese scale has good reliability and validity, with a Cronbach's α of 0.941. And the Cronbach's α coefficient in this study was 0.926.

Decision Preparation

The Preparation for Decision Making Scale (PrepDM) was developed by Bennett [22] in 2010 to assess patients' perceptions during the decision-making process. The Chinese version of Decision Preparation Scale [20] was translated by Li. The scale consists of 10 items. Each item used 5-point Likert scale. The Chinese version of the Preparation for Decision Making questionnaire contained 10 items. The scores of each item are added to the mean value, multiplied by 20, and converted to 0-100 points. A total score of more than 60 points indicates better decision preparation. The Cronbach's α coefficient in this study was 0.916.

Data collection method

The researchers instructed the patients to carefully read the questionnaire instructions and explained the purpose and significance of the research. Each patient completed the questionnaire independently and the questionnaire were collected on the spot. All the participants signed informed consent. All the 330 potential patients completed the questionnaires, and 320 included in the final analysis.

Statistical Analysis

Data analysis were performed by SPSS 20.0 and STATA 15.0. Statistical significance was set as $P < 0.05$. The means (standard deviations) and frequencies (percentages) were used to describe the characteristics of the participants. Pearson's correlation analyses were used to exam the relationship among decision regrets, decision conflict and decision preparation. Multivariate stepwise regression analysis was used to find the influencing factors of decision regret, and to exam whether decision-making preparation moderate the relationship between decision conflict and decision regrets when demographic and clinical characteristics were controlled in regression model . If the moderation effect of decision-making preparation exists, then the Johnson-Neyman technic was applied to explore the conditional effect of decision regrets on decision conflict across the range of decision-making preparation.

Results

330 patients participant in thisi survey and 320 questionnaires were effective with a response rate of 97%. The participant aged between 25 and 76 years, mean age was 49.25 years (SD=10.26). only 12.5% patients have religious belief. 91.25% patients married, and . Of this total, 176 patients(55%) made surgery treatment with family. But if give another chance, 147 patients(45.96%) want to make decision by herself. Meanwhile,61.25% patients didn't do decision preparation.The distribution of demographic characteristics is shown in Table 1.

Decision regret scores of post-operation breast cancer patients

The average score of the 320 participants' postoperative decision regret was 34.28(SD=20.18).

Bivariate Correlations Among the main variables

Pearson correlation analysis showed that decision regret was positively associated with decision conflict ($r=0.853$, $p<0.01$), and negatively associated decision preparation ($r=-0.404$, $p<0.01$). Further, decision conflict was negatively related with decision preparation ($r=-0.524$, $p<0.01$).

The regulating effect of decision preparation on the relationship between decision conflict and decision regrets

Controlling all demographic and clinical characteristics in the analysis process, the results showed that decision-making preparation played a regulatory role in the emergence of decision conflict and decision

regret (decision-making preparation $\times$ decision conflict: $\beta=1.408$, $p<0.05$), the detailed results are shown in Table 2.

Note: All demographic variables were adjusted. * $p\leq 0.05$ ** $p\leq 0.01$

The Johnson-Neyman technique was used to further explore the boundary value of the decision-making preparation adjustment effect and the range of the statistically significant decision-making preparation. Analysis found that the correlation between decision conflicts and decision regrets increases with the increase of decision-making preparation, indicating that the adverse effects of decision conflicts on decision regrets gradually increase with the increase of decision-making preparation. The 95% confidence interval does not include 0, as shown in Figure 2.

Discussion

To date, the interplay between decision regret, decision conflict and decision preparation has not been indirectly tested via a mediation model. Several studies have found that decision regret was related with decision conflict, but there are no research to exam the possible mechanism for this correlation. We found decision regret BC patients more negatively engage in decision progress, and this was related with less decision preparation and developed more decision conflict.

The results of this study show that the postoperative decision regret score of 320 breast cancer patients was 34.28 ± 20.18 , which is higher than the decision regret level in Chinese American women with BC[18]. The reasons could be that the inclusion population live in different countries and share a different medical service. In China, BC patients play a passion role in decision progress, and they didn't have enough time to do a preferred decision because of the heavy patient's burden[7]. In USA, the decision regret is associated with financial barriers and consultation limitation by language. Our finding is similar with several investigation [9,23] which are carried on BC patients aiming to exam the level of decision regret after surgery. With the spread of Shared decision making, the physicians encourage patients to participant in treatment decision aiming to meet patients' needs and preference[24]. Most Chinese patients still prefer survival rate rather than quality of life. Because of traditional culture and patients' perception, the mastectomies is the best treatment in economic cost and survival[25]. Meanwhile, one research found that age affects decision regret among breast cancer patients, especially among patients after total mastectomy, such that younger patients experienced more decision regret[9]. The high incidence of young patients' decision regrets is related to fertility, and the reason why the results of this study are inconsistent with the results of Japanese research may be due to the fact that 83.75% of the subjects included in the present study were older than 40 years old and had fewer fertility concerns[9]. In addition, the types of surgical procedures and different occupational types affect patients' decision regret. Because of women who engage in contract or part-time work have a lower probability of experiencing decision regret than women with working full-time. A previous research in German[26] found that patients were more inclined to consult doctors and think their doctors would show more sympathy. In our study, 55% BC patients do surgical options with family. The reasons is that BC patients build a poor

communication with clinicians and have no time to discuss the type of cancer, its treatment, and a person's preferences and perceptions of treatment choices[27-30]. Therefore, health professionals build a systematic shared decision-making model to provide adequate information and enough decision-making time, do a high-quality decision and relieve the level of decision regret.

In this study, decision-making preparation had a regulatory effect between decision conflicts and decision regrets. The prerequisite for patients to participate in treatment decision-making included 2 basic conditions: 1) patients are willing to participate in treatment decisions and 2) patients have the ability to participate in decision-making[32]. Decision-making preparation manifests as participation competence in decision-making process with their doctor[22]. In China, cancer patients are highly motivated to participate in treatment decision, but more than 40% patients depend on physicians to make treatment decision and 62.8% patients make decision with family actually[32]. One explanation is traditional Chinese cultural centered on family since ancient times. In addition, Ottawa's decision support theory based on decision conflict theory and social support theory[16] have determined that participation competence is a prerequisite for the decision-making process. Decision-making is a complex process, and there are many influenced factors such as social statistics and clinical characteristics, expectations, values, decision conflicts, social support, decision-making roles, and personal resources[24]. When BC patients actively participate in treatment decision, they will seek the amount of information about available options and reduce decision regret[33]. However, this study found the influence of decision conflicts on decision regrets increases with decision-making preparation increases. One possible explanation is that the source of information mainly relies on the internet in Chinese medical environment. Network information is not strictly screened and often causes greater decision conflicts in decision-making. Thus, medical staff shouldn't blindly pursue the increase of patient participation and should provide specialization information support for breast cancer patients to increase decision preparation and eliminate decision conflict.

Our finding also has an important clinical implication for relieve the level of decision regret. We found that greater decision conflict predicted a higher level of decision regret, and similar result also found in a previous study[34]. The reason is that different breast surgical operation have different risks and benefits. Because of there are no adequate information support to introduce costs, surgical sites, potential complications, and femininity with post-operation. These results are similar with the shared decision-making model[23, 35], which determine the importance of patients' information needs before decision-making, and encourage patients actively participating in decision-making experience less regret than women who delegate treatment decision-making to their physicians. A research shown that breast cancer treatment was widely selective and active. Because of various medical advice may make patients feel overwhelmed and they have a difficulty to understanding medical information [36, 37]. A study in Australia showed that the Breast Reconstruction Decision Support Program significantly reduced decision conflicts and increased satisfaction with information [38]. The overall cost of breast reconstruction decision support programs was less than that of other medical interventions. This suggests that in the process of intervention, we cannot blindly pursue the increase of patient participation and, more importantly, must improve patients' understanding during the process of assisting decision-making in order to improve

interventions. For Chinese American women, providers need to develop decision support interventions to support breast cancer patients in making high-quality decisions, but these interventions must also identify established socio-demographic factors[39]. Meanwhile,our prior study found decision aids also reduce the level of decision regret by guiding decision-making and clarifying value preference[40]. Future studies should focus on the impact of caregivers on decision-making with breast cancer patients.

Limitations and Future Direction

This study investigated t the regulatory role of decision-making preparation between decision conflicts and decision regrets. However, this study also had several limitations. On the one hand, this study utilized a cross-sectional design and it is not possible to infer a causal relationship. Further research should focus on qualitative study to deeply mini the relationship between decision conflict and decision regret. On the other hand,, this study only collected questionnaires in one hospital in which participants were recruited from an cancer institute in northern part of China. thus.more patients from various parts of the country make the research object more diverse and extensive and facilitate national comparison in future research. Lastly, there were few variables included in this study. Further research should focus on testing what other influenced factors between decision conflict and decision regret.

Conclusion

In summary, this study demonstrated the relationship among the three variables (decision preparation,decision conflict, and decision regret). Decision-making preparation was negatively associated with decision- conflicts and decision regrets, and Decision preparation have a regulatory effect between decision conflicts and decision regrets.. As decision-making preparation increases, so did influence of decision conflicts on decision regrets. Results indicate that reducing decision preparation can be expected to improve the level of decision regret among Chinese BC patients, by the regulatory role of decision preparation.

Declarations

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Authors' contributions: Yan Wang is responsible for the entire design and writing of the paper.Qingyue Zhang is responsible for part of the design and writing of the paper. Jianmei pang is responsible for the

data analysis and writing of the paper. Liyuan Shi, Xiaoyuan Wang and Di Yan are responsible for data collection. Jian Yin is responsible for expert consultation on paper. Wanmin Qiang guides the design and writing of papers.

Consent to participate: N/A

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Tables

Table 1 Participants’ characteristics

Variable	N (%)
Ageyears	
≤40	5216.25
41-50	14043.75
51-60	7924.69
≥60	4915.31
Religious	
Yes	4012.5
No	28087.5
Educational level	
≤Elementary	4413.75
Junior high school	9028.13
High school	8827.5
College	9228.75
Graduate or above	61.9
Incomeyuan	
<1000	4112.81
1000-3000	11435.63
3000-5000	11134.69
5000-10000	3510.94
>10000	195.94
Occupation status	
Yes	11736.56
No	20363.44
Marital status	
Married	29291.25
Unmarried	92.81
Widowed/Divorced	195.94
Medical expenses	

Rural medical insurance	75	23.44
Town medical insurance	217	67.81
Other	28	8.75
Operation		
Mastectomy	176	55.00
Breast conserving surgery	78	24.38
Breast reconstruction	66	20.62
Primary decision-maker		
With family	176	55.00
Patient himself	36	11.25
Doctors	108	33.75
Who you want to make surgical decision if we give you another choice		
With family	104	32.5
Patient himself	147	45.94
With Doctors	69	21.56
decision conflict		
≤25	28	8.75
25-37.5	192	60.0
≥37.5	56	17.5
Decision-making preparation		
≤60	196	61.25
≥60	124	38.75

Table 2 Analysis of the adjustment effect of decision-making preparation between decision conflicts and decision regrets

Variable	Step 1		Step 2	
	β	<i>SE</i>	β	<i>SE</i>
decision conflict	15.326**	0.984	15.918**	1.016
Decision-making preparation	0.587	0.817	1.092	0.846
decision conflict × Decision-making preparation			1.408*	0.654
R ²	0.798		0.801	
ΔR ²	0.798		0.003	
F	46.382**		45.326**	

Figures

Figure 1

Hypothetical model

Figure 2

Conditional Effect of Decision Preparation to Regulate Decision Conflict on Decision Regret