

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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Abstract

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

Methods: A cross-sectional survey was carried out. 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 with 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 regret increases with the increase in decision-making preparation.

Conclusion: The adverse effects of decision conflicts on decision regret gradually increase with the increase in decision-making preparation. Results indicate that reducing decision preparation can be expected to improve the level of decision regret among Chinese postoperative BC patients. Thus, Clinical staffs should encourage patients to take an active part 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 85–88% [2]. Surgical treatment is part of the important methods for comprehensive treatment of breast cancer patients. The surgical decision-making is a complicated and difficult process 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 becomes a critical research question.

In China, cancer is a family event. Facing with many treatment decisions, BC patients always require to weigh efficacy, safety, post-operation complications, cost, quality of life and follow-up treatment [7]. Besides, the decision-making progress were influenced by family factors, traditional culture and fatalism[8]. When confronted with surgical decision, BC patients always experienced anxiety, illness uncertainty, depresses, hesitation and decision conflict[9]. Facing numerous 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[10]. A survey showed 6–23% of cancer patients experience decision regret[11]. Therefore, different surgical decision-making may contribute to different quality of life and body image.

Decision regret is a measure of the quality of decision making. Regret was often considered to be negative psychological and emotional feelings related to considering a past or future choice[11, 12]. Prior studies have shown that the active involvement in treatment decision can get more satisfaction about decision-making process[13, 14]. In China, almost all patients follow the traditional paternalistic medical decision-making model and this decision-making model ignores the patient's right of informed consent [15]. 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 a treatment decision in China[8]. The decision regret associated with various factors including lack of treatment information, individual value, personality traits, decision conflict, decision attitudes and cultural factors[16, 17]. Berry et al.'s research has demonstrated 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[18]. Share decision-making is the peak form of patient-centered care, which encourage patients actively participate in their own treatment decisions[19]. The surgical options are 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 knows 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 regret. The hypothetical model is shown in Fig. 1, which details treatment decisions for breast cancer patients. Further information will provide a theoretical basis for improving patients' ability to make relevant decisions.

Methods

Participants

A convenient sampling method was utilized 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 within the last 6 months. (3) underwent breast cancer surgery. Exclusion criteria included: (1) had other malignant tumors in the past; (3) have an additional acute 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 consent. This study was approved by the Institutional Review Board of Tianjin Cancer Hospital, Tianjin, China.

Measures

The demographic questionnaire was self-designed by the 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 [20] in 2003 to assess the level of regret of a patient's treatment-related decision after surgery. This 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 score of item is subtracted from the raw score and the result is multiplied by 25. The total (mean) score 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 [21]. 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 [22]. The study used a Chinese version of Decision Conflict Scale by Li [23]. 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 total converted score firstly was summed all item scores, then was divided by 16 and multiplied by 25. The total converted score range from 0–100, with a higher score indicating a higher level of decision conflict [24]. Total score 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.

The Preparation of decision-making

Preparation for Decision Making Scale (PrepDM) was developed by Bennett [25] in 2010 to assess patients' perceptions during the decision-making process. The Chinese version of Decision Preparation Scale [23] was translated by Li. The scale consists of 10 items. Each item used 5-point Likert scale from 1–45 (from not at all to a great deal). The Chinese version of the Preparation for Decision Making questionnaire contained 10 items. The score of each item is 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 this purpose and significance of the research. Each patient completed the questionnaire independently and the questionnaire was collected on the spot. All the participants signed informed consent. 330 patients met the inclusion criteria were included in the study. Of these patients, 10 refused to participate in the study and did not sign the informed consent form. Thus, 320 included in the final analysis.

Statistical Analysis

Data analysis was performed by SPSS 20.0 and STATA 15.0. Statistical significance was set at $P < 0.05$. 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 regret, 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 regulates 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 technique was applied to explore the conditional effect of decision regret on decision conflict across the range of decision-making preparation.

Results

330 patients participate in this 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 176 patients(55%) made surgical treatment with family. But if give another chance, 147 patients(45.96%) want to make the decision by themselves. Meanwhile,61.25% patients didn't do decision preparation. The distribution of demographic characteristics is shown in Table 1.

Table 1
Participants' characteristics

Variable	N (%)
Stage	
I	83(25.94)
II	237(74.06)
Age(years)	
≤ 40	52(16.25)
41–50	140(43.75)
51–60	79(24.69)
> 60	49(15.31)
Religious	
Yes	40(12.5)
No	280(87.5)
Educational level	
≤Elementary	44(13.75)
Junior high school	90(28.13)
High school	88(27.5)
College	92(28.75)
Graduate or above	6(1.9)
Income(yuan)	
< 1000	41(12.81)
1000–3000	114(35.63)
3000–5000	111(34.69)
5000–10000	35(10.94)
> 10000	19(5.94)
Occupation status	
Yes	117(36.56)
No	203(63.44)
Marital status	

Variable	N (%)
Married	292(91.25)
Unmarried	9(2.81)
Widowed/Divorced	19(5.94)
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-making 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)

Decision regret scores of post-operation breast cancer patients

The average score of 320 participants' postoperative decision regret was 34.28 (SD = 20.18), the mean score of decision conflict was 28.41 (SD = 6.99), and the average score of decision-making preparation was 57.34 (SD = 20.77).

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 to 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.

Table 2

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

Variable	Step 1		Step 2	
	β	SE	β	SE
Decision-making conflict	15.326**	0.984	15.918**	1.016
Decision-making preparation	0.587	0.817	1.092	0.846
Decision-making conflict \times Decision-making preparation			1.408*	0.654
R ²	0.798		0.801	
ΔR^2	0.798		0.003	
F	46.382**		45.326**	
Note: All demographic variables were adjusted. * $p < 0.05$; ** $p < 0.01$				

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 regret increases with the increase in decision-making preparation, indicating that the adverse effects of decision conflicts on decision regret gradually increase with the increase in decision-making preparation. The 95% confidence interval does not include 0, as showed in Fig. 2.

Discussion

The results of this study showed that the postoperative decision regret score of 320 breast cancer patients was 34.289(SD = 20.18), which was higher than the decision regret level in Chinese American women with BC[21]. The reasons could be that the inclusion population lived in different countries and shares a different medical information. In China, BC patients played a passive role in decision progress, and they didn't have enough time to do a preferred decision because of the heavy patient's burden in the hospital[10]. A qualitative research have found that Chinese BC patients only consider the survival and financial burden during the treatment period[8]. And Chinese patients ignored the aesthetic effect, quality of life or other long-term effects in the postoperative phase. In USA, the decision regret is associated with financial barriers and consultation limitation by language[21]. Our finding is similar with several investigation [11, 26] which are carried on BC patients aiming to exam the level of decision regret after surgery. Because of traditional culture and patients' perception, mastectomies is the best treatment in economic cost and survival in China[27, 28]. one research found that younger patients experienced more decision regret[11], because they experienced fewer fertility concerns. In addition, the study also found women who engaged in a contract or part-time work had a lower probability of experiencing decision regret than women with working full-time[11]. Because of the heavy medical burden in China, BC patients built a poor communication with clinicians and had no time to discuss the type of cancer, treatment, and a person's preferences and perceptions of treatment choices[30–33]. With the spread of shared decision making, the physicians encourage patients to positively participate in treatment decision aiming to meet patients' needs and preference[27]. 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.

This study showed that decision conflict had a signification relationship with decision regret. Meanwhile, decision-making preparation had a regulatory effect between decision conflicts and decision regret. The results reveals that the influence of decision conflicts on decision regret increases with decision-making preparation increases, which is similar with our hypothesis. Cohan investigated the influencing factors of decision regret, and found decision conflict have a direct effect on decision regret[34]. Decision-making is a complex process, and there is many influenced factor such as social statistics and clinical characteristics, expectations, values, decision conflicts, social support, decision-making roles, and personal resources[27]. These include the decision of mastectomy vs. lumpectomy, whether to pursue contralateral prophylactic mastectomy, and whether to pursue reconstructive surgery[35]. These decisions require women to weigh the risks and benefits, recovery time and short and long-term effects associated with the different surgical options[36]. In China, more than 40% patients depend on physicians to make treatment decision and 62.8% patients make decision with family actually[37]. Majority of breast cancer patients had a knowledge gaps in surgical type, and negative changes in body image and sexual satisfaction were related with decision regret[38]. In addition, Ottawa's decision support theory based on decision conflict theory and social support theory[20] determined that participation competence is a prerequisite for the decision-making process. Chinese BC patients had a difficulty in communicating with physicians and clearly expressing their values or preference. 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[39]. Thus, medical staff should be decision-making guides, and provide specialization information support for breast cancer patients to increase decision preparation and eliminate decision conflict.

This study also found that greater decision conflict predicted a higher level of decision regret, and a similar result also found in a previous study[40]. The reason is that different surgical operation has different risks and benefits. Because there are no adequate information support to introduce costs, surgical sites, potential complications, and femininity with post-operation. However, the share decision-making model[26, 41] determined the importance of patients' information needs before decision-making, and encourage patients actively participating in decision-making experience with less regret than women who delegate treatment decision-making to their physicians. A research showed that breast cancer treatment was widely selective and active, because various medical advice may make patients feel overwhelmed and they had a difficulty to understand medical information [42, 43]. A study in Australia showed that the Breast Reconstruction Decision Support Program significantly reduced decision conflicts and increased satisfaction with information [44]. Thus, Clinical nurses cannot blindly pursue the increase of patient participation and need to develop decision support interventions to improve patients' understanding about medical information. Meanwhile, our prior study found decision aids also reduce the level of decision regret by guiding decision-making and clarifying value preference[45]. Future studies should focus on the impact of the family on decision-making with breast cancer patients.

Limitations and Future Direction

There are some limitations in our study. Firstly, this was a descriptive cross-sectional study, the convenience sampling method instead of random sampling method was adopted. Secondly, only one hospital sample was selected which limited the representativeness of the samples. Thirdly, limited by time, this study is a cross-sectional rather than longitudinal design. Further study should be conducted to explore the decision regret, decision conflict and decision preparation in different time points of patients with breast cancer.

Conclusions

In summary, this study demonstrated the relationship among the three variables (decision preparation, decision conflict, and decision regret). Decision preparation was negatively associated with decision-conflicts and decision regret, and Decision preparation have a regulatory effect between decision conflicts and decision regret. As decision preparation increases, so did influence of decision conflicts on decision regret. 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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Conflicts of interest/Competing interests:

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Code availability:

N/A

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.

Ethics approval:

This study was approved by the hospital ethics committee (code number:bc2017024) to protect the rights of patients.

Consent to participate:

N/A

Consent for publication:

All authors expressed the authenticity of the data and agreed to be published in this journal. The work described has not been published previously, that it is not under consideration for publication elsewhere, that its publication is approved by all authors and tacitly or explicitly by the responsible authorities where the work was carried out, and that, if accepted, it will not be published elsewhere in the same form, in English or in any other language, including electronically without the written consent of the copyright-holder.

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Figures

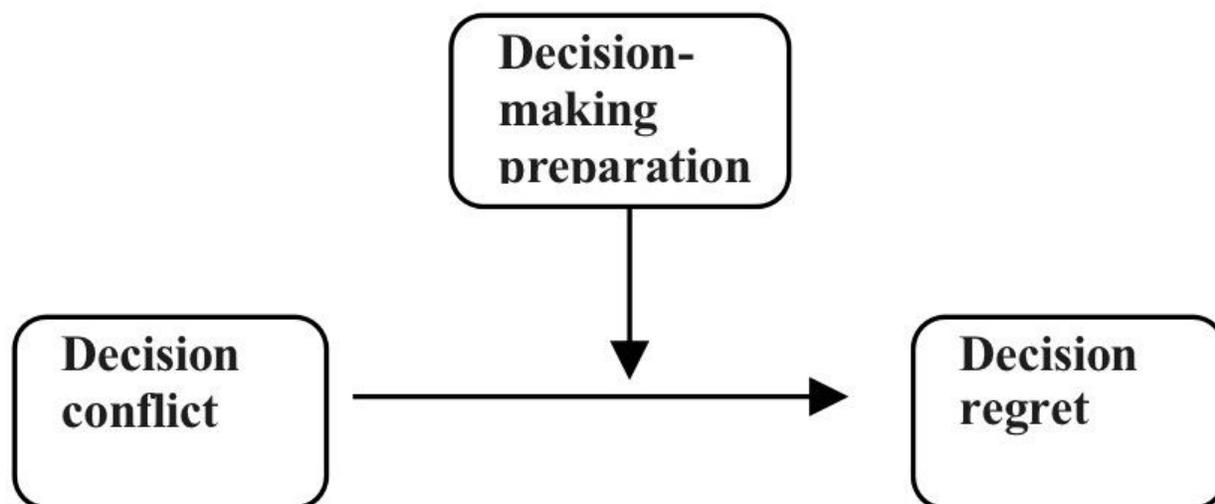


Figure 1

Hypothetical model

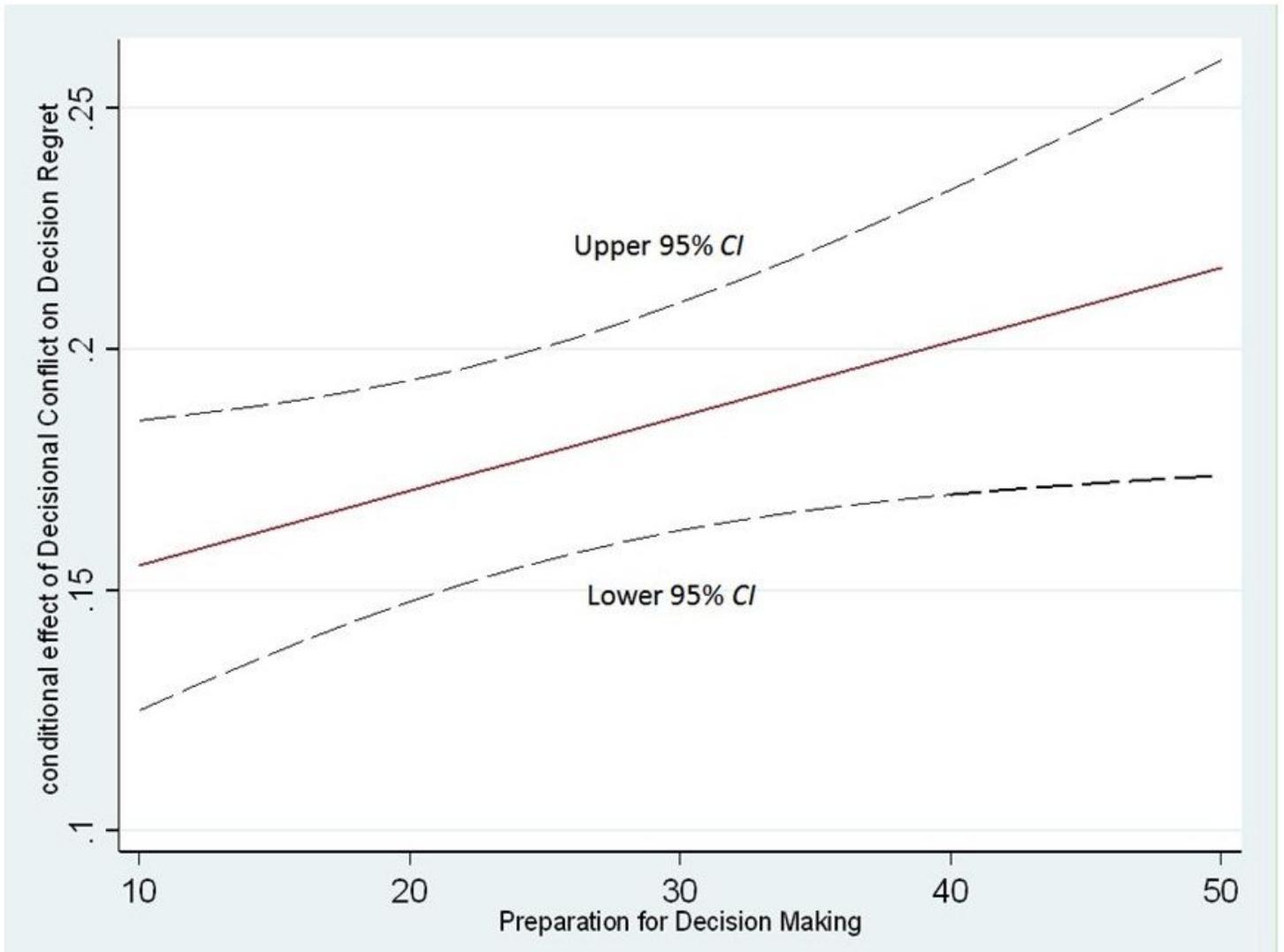


Figure 2

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