Influencing Factors of Lung Cancer Patients' Participation in Shared Decision-making: a Cross-sectional Study

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Abstract

Purpose: The purpose of this study was to investigate and analyze the level of actual participation and perceived importance of shared decision-making on treatment and care of lung cancer patients, to compare their differences and to explore factors that influence them.

Methods: A total of 290 lung cancer patients were collected from the department of oncology and thoracic surgery of a comprehensive medical center in Qingdao from October 2018 to December 2019. Participants completed a cross-sectional questionnaire to assess their actual participation and perceived importance in shared decision-making on treatment and care. Descriptive analysis and non-parametric tests were carried out to assess the status quo of patients' shared decision-making on treatment and care. Binary logistic regression analysis with a stepwise back-wards was applied to predict the factors that affected patients' participation in shared decision-making.

Results: The results showed that patients with lung cancer had a low degree of participation in shared decision-making. There were significant differences between actual participation and perceived importance of shared decision-making on treatment and care. Education level, younger, gender, income, marital status, personality, the course of the disease (>6 months), and the Pathological TNM staging (□) affected the patient's level of participation in shared decision-making.

Conclusion: Actual participation in shared decision-making for the treatment and care of lung cancer patients was low and considered unimportant. We could train oncology nurses to use patient decision aids to help patients and families participate in shared decision-making based patients’ value, preferences and needs.

Introduction

World Health Organization reported that the number of new cases and deaths of lung cancer ranked first in 2018 [1]. The common treatment methods including surgery, chemotherapy, immunotherapy, and targeted therapy have been selected to prolong lifespan [2], which increases the risks of distant metastasis, chemotherapy reaction and so on. During the terminal phase of lung cancer patients may also choose palliative care (nutritional support, psychological care), which focuses more on improving patient's quality of life. Consequently, patients need to weigh the uncertain risks and benefits between supportive treatments focusing on prolonging survival and quality of life [3]. In this sense, a rational, scientific decision-making process is needed to ensure patients select treatments and care methods that are consistent with their concerns, goals, values, preference, and circumstances.

With the transformation of medical models, "shared decision-making" has become the best way to exchange information between clinicians, nurses and patients. As a scientific decision-making process, SDM is a more inclusive and participative approach involving the exchange of information between professionals and patients [4-5]. During the dialogue, both healthcare practitioners and patients think about how to address patient's co-occurring condition based on the relevant evidence and the patients’ values, preference, needs [6]. Elwyn et al. (2017) proposed and revised the three-talk model to guide SDM [7]. The SDM process is divided into 3 stages: 1) team talk: patients, family, and physician form a team to understand patient's goals, describe options and offer support; 2) option talk: various options are discussed using risk communication principles; and 3) decision talk: informed preferences are obtained and informed choices are made. The three-talk model is more concise to help clinicians better understand the core of SDM and implement these processes.

SDM is a disruptive idea and cornerstone of patient-centered care [8]. Compared with informed consent, it pays more attention to the needs, expectations and moral values orientation of patients and is representative of the type of clinical interactive decision-making. Friesen-Storms et al. (2015) have agreed that SDM is the best process whereby health care providers and their patients make information exchange and treatment decisions jointly [8]. Nakayama et al. (2020) find that more prostate cancer patients were willing to actively participate in SDM, with only a minority preferring paternalistic decision-making [9]. Similarly, most breast cancer patients report wanting to be involved in SDM because they have not acquired adequate knowledge concerning risks factors for breast cancer treatment and care [10]. SDM primarily focuses on lung cancer screening when it is applied to lung cancer field [11-12]. Lung cancer screening is very important for high-risk groups (smoking, patients with chronic lung disease),

and it is convenient for early treatment of patients [13]. Similarly, SDM in the field of lung cancer treatment and care is also involved. There is evidence that some lung cancer patients prefer treatment and care options that improve quality of life the pros and cons of different approaches are not explain in detail when they make decisions [14].

Patient decision aids are tools that help them understand options, consider possible hazards and benefits, and encourage patients to make the best choices for specific problems prudently and wisely [15]. The International Patient Decision Aid Standards (IPDAS) [16] and The Ottawa Decision Support Framework（ODSF) [17] are two criteria for evaluating the development process and quality of patient decision assistance tools. IPDAS has developed a checklist to help researchers develop patient decision aids (http://ipdas.ohri.ca/using.html). ODSF can guide the development of patient decision aids from three aspects: decisional needs, decision support and decisional outcome (https://decisionaid.ohri.ca/odsf.html).

While many clinicians believe they implement SDM, they actually do not [10]. Lack of time, skills, and resources are all factors that affect clinicians' implementation of SDM [18]. These factors influence the level and attitude of lung cancer patients to participate in SDM. Some studies have also explored the subjective factors that influence cancer patients' participation in SDM, such as education level [19]. However, there is a gap in research exploring the factors that influence Chinese lung cancer patients' participation in SDM.

To make a thorough inquiry of the actual participation and perceived importance of lung cancer patients' involvement in SDM in terms of treatment and care, we have conducted this cross-sectional survey. The purposes of the current study are to: (1) assess the current status of lung cancer patients' attitudes and actual participation in SDM on treatment and care; (2) explore whether there is a statistical difference between the actual participation and perceived importance of lung cancer patients in SDM on treatment and care; and (3) predict factors affecting lung cancer patients' participation in SDM on treatment and care.

Methods

Design, participants and recruitment

This study adopted a cross-sectional study design. We collected lung cancer patients in the thoracic surgery and oncology department of a comprehensive medical center in Qingdao, China from October 2018 to December 2019. Participants were eligible for inclusion if they: (1) were 18 years older; (2) met the diagnostic criteria for lung cancer and were aware of the condition [20]; and (3) were informed consent and voluntary to participate in this research. Exclusion criteria included: patients suffered: (1) severe damage to other organs (such as heart, brain, liver, kidney, etc.) or other severe malignant tumors; (2) cognitive impairment or mental illness; and (3) disputes between themselves or their family and the medical institutions.

This study used the cross-sectional study calculation formula $N = 4(\mu\alpha S/\delta)^2$, where α was 0.05, δ = 0.5S, and the sample size least was 62 cases. We assumed a 20% loss of follow-up rate, about 75 patients were required. To avoid the bias of results caused by a small sample size. A total of 300 patients with lung cancer were enrolled, eventually. Among them, seven patients gave up answering, and three patients stopped answering because of unstable condition. Finally, a total of 290 lung cancer patients participated in this research (response rate = 96.7%).

The data were collected by the researchers on-spot at the bedside of the patient. Before collecting the data, the researchers explained the purpose and significance of the study in order to gain the trust of the patients. Data about the study participants was collected by a paper questionnaire. The researchers were presented to explain the queries to the patients without using eliciting language. If patients were encountered to be agitated or unstable during the study, responses were terminated and reassurance was provided. After the subjects finished their answers, the researchers retrieved the questionnaire and checked for any omissions. If any, they were made up on the spot.

Measures

Sociodemographic and clinical variables

The module on patient characteristics included gender, age, marital status, comorbidities, medical insurance, education level, number of children, income, personality, course of disease and pathological TNM stage. Based on Jung's theory of psychological types, we divided personality into introverted and extroverted types [21]. Patients who claimed themselves as quiet, eccentric, and preferring solitude to contact with others were considered introverted. Patients who self-reported being enthusiastic, lively, sociable and adaptable to their environment were considered extroverted.

Questionnaire of Cancer patients' decision-making regarding treatment and care

Lung cancer patient's SDM on treatment and care was assessed using the questionnaire compiled by Sainio and Lauri (2003) [22]. The questionnaire consists of four dimensions (actual participation of SDM on treatment and care, perceived importance of SDM on treatment and care) that are rated on a Likert scale from 1 to 3. Finally, we calculated the average value of each part of the scale to evaluate the actual participation degree and perceived importance of people with lung cancer in SDM (≤ 1.5 means high degree of actual participation and perceived importance, > 1.5 means low degree of actual participation and perceived importance).

The Chinese version of the questionnaire has been revised and developed by Ma (2004), in which the first item "Amount of intravenous fluids" and the seventh item "Investigation scheduling" were deleted [23] After measuring the reliability and validity of the Chinese version of the scale, it exhibited an acceptable content validity index (CVI = 0.89) and internal consistency (Cronbach's α 0.851 in the perceived importance subscale, Cronbach's α 0.838 in the actual participation subscale).

Data analysis

The survey data were analyzed using the statistical package IBM SPSS v25.0 (IBM. Corp, New York). Descriptive analyses were applied to analyze socio-demographic variables and disease-related data. We used the Wilcoxon Matched-pairs Signed-rank test to analyze the difference between actual participation and perceived importance. Binary logistic regression analysis with a stepwise back-wards was used to predict the factors that affected actual participation and perceived importance of SDM on treatment and care. A variance inflation factor (VIF) was used to test for multicollinearity, and studies with a VIF of less than 10 were generally considered less likely to have multicollinearity. Because the scales were reversely scored. Thus, in the dummy variable setting of the binary logistic regression model, actual participation in SDM on treatment and care as the dependent variable was 0 for high and 1 for low. Similarly, for perceived importance, importance was 0 and insignificance was 1. The Hosmer-Lemeshow test was used to assess the goodness-of-fit of the model. Statistical significance was set at $P < 0.05$.

Ethical considerations

We strictly followed the Helsinki Declaration of the World Medical Congress to conduct this research. The study was approved by the ethics committee of the university to which the investigators belonged. Written informed consent was obtained from all patients and their legal representatives.

Results

Sample characteristics and situation analysis

Of 290 lung cancer patients completed the study, ageing from 29 to 70 years (56.37±9.05), and almost half of whom were female (47.9%, n = 139). Nearly 72.1% of the 290 patients had a junior high school education or higher, the vast majority had an income above 3000 RMB (96.9%, n = 281), most were diagnosed with stage Ⅲ or Ⅳ (70.7%, n = 205), and more than one-third of patients had a disease course of 3 – 6 months. Specific information is presented in Table 1.

Only 11% of the 290 participants' actual participation in care SDM was higher, as well as 18.3% of the patients felt that care SDM was important. However, 26.9% of patients actually engaged in treatment SDM higher. SDM for treatment was considered more important by 61% compared to SDM in terms of care (Supplementary file 1).

Comparison of the actual participation and perceived importance of SDM on treatment and care

To better understand the differences between patients' actual participation and perceived importance in SDM on treatment and care, we performed Wilcoxon Matched-pairs signed-rank test (Supplementary file 2 and 3). The results showed that both the actual participation and perceived importance of SDM on treatment and care of lung cancer patients were statistically significant (P <0.01).

Prediction of factors affecting actual participation and perceived importance of SDM on treatment

The VIF test results of this study was less than 5, so the likelihood of multicollinearity was minimal. The results of binary logistic regression with a stepwise backward showed that actual participation in SDM was higher among lung cancer patients who were male, younger, had disease course more than 6 months, TNM stage IV, higher education and income (Table 2). However, actual participation was lower among lung cancer patients with a disease course of 3-6 months.

We also found higher awareness of the importance of SDM on treatment among patients with other marital status (e.g., divorced, widowed), higher literacy and income (Table 3). However, patients with stage Ⅲ TNM and disease course of 3 – 6 months had lower perceived importance of SDM on treatment (Table 3).

Prediction of factors affecting actual participation and perceived importance of SDM on care

We found that patients with lung cancer were more willing to participate in care decisions when they possessed higher education, higher income levels, more children, an outgoing personality, and a disease course of more than 6 months (Table 4).

We also found that patients with lung cancer perceived higher importance when they possessed higher education, income level, were male, other marital status (e.g., divorced, widowed), had a disease course of more than 6 months, and had TNM stage Ⅲ (Table 5). Among disease-related factors, lung cancer patients with a course of 3 – 6 months considered it unimportant to participate in SDM on care (Table 5).

Discussions

SDM is important because it ensures that patients' values, preferences, beliefs and their contextual factors guide all clinical decisions in an evidence-based context [24]. The results of this study indicated that actual participation and perceived importance of SDM on treatment and care among lung cancer patients was low. Furthermore, the actual participation of lung cancer patients in SDM on treatment and care was lower than their perceived importance. This suggested that although participants perceived that participation in SDM on treatment and care was important, their actual participation was not high.

The results of this study suggested that patients with higher education actually participated to a greater extent and perceived importance of SDM on treatment and care [19]. Patients with low education level had difficulty in understanding the complexities of medical science or even communicating with healthcare professionals, making it difficult for them to make the best choices. Patients with a high level of education were more likely to receive disease-related information. Studies demonstrated that lung cancer patients would be very interested in the treatment and care process if they had access to sufficient information (19,25-26).

Although Chinese existing health insurance policy has wide coverage, not all anticancer drugs mainly used by cancer patients are included in the healthcare system. It is still a heavy burden especially for low-income cancer patients in rural China [27]. We speculated that this group of patients develop thoughts of abandoning treatment due to the high cost of treatment and care, and had difficulty actively participating in SDM. However, it does not preclude the possibility that some of these patients may be more active in discussing cost-efficient treatment options with clinicians and have a higher level of SDM. Therefore, the impact of income level on lung cancer patients' participation in SDM needs to be further explored.

Divorced and widowed patients considered it was important to participate in SDM on treatment and care. Some studies had shown that family involvement in SDM for cancer patients was associated with a better understanding of cancer-related information [28]. In the absence of family support, divorced and widowed patients would engage in the three-talk model on their own and make informed decisions with clinicians. In this context, medical staff should provide adequate decision support to patients, and information about patient's concerns (treatment modalities, side effects, prognosis).

Men and younger patients were actually more participate in SDM on treatment. Male patients generally took on more responsibility in the family and could analyze treatment more rationally. Younger patients are more receptive to the disease and more knowledgeable about relevant information than the elderly. As a result, male and younger patients more actively participated in SDM on treatment.

We also found that patients who were extroverted and had more children actually had higher levels of SDM involvement in care. We speculated that extroverted patients were willing to participate in care decision and chose more appropriate care for themselves. Patients with more children had stronger family support systems. For complex methods of care, the children of this group of patients would help them understand, which would help increase the patient's motivation to participate in care decisions.

Patients diagnosed with cancer less than 3 months may be in a fear psychological stage [29]. They fear and refuse to acknowledge that they have been confirmed to have lung cancer. Lung cancer patients diagnosed within 3–6 months underwent chemotherapy and experienced intolerable adverse effects that make them resist treatment and care options. As a result, patients at this stage have a low level of actual participation of SDM on their treatment and perceive SDM as unimportant in treatment and care. Lung cancer patients with a course of more than 6 months may be in the adaptation period, accept their own diagnostic facts, actively participate in the treatment and care of SDM and discuss more useful programs.

TNM stage is an important determinant of survival in lung cancer patients [30]. For patients with stage III lung cancer, the five-year survival rate is much lower than for stages I and II, and most patients receive chemotherapy and radiotherapy with enduring adverse reactions [30]. Therefore, we speculated that patients with stage III lung cancer were not better off after receiving treatment and did not consider decision on treatment approach to be important. We found that stage IV patients considered SDM on care to be more important. The five-year survival rate for patients with stage IV lung cancer pathology was estimated to be 13%, compared to 2% for clinical stage IV patients [30]. Patients with stage IV lung cancer present with symptoms such as cough, dyspnea, hemoptysis and chest pain. For these reasons, we speculate that patients prefer care methods that promote a better quality of life rather than pursuing a longer survival rate. Therefore, they focus more on the care approach.

Healthcare professionals can use patient decision aids to help patients understand the treatment process and encourage them to express their wishes. The patient decision aids website, established by the Ottawa Hospital Research Association, is a platform that provides decision support [31]. We can directly download and use the patient decision aids list for lung cancer screening patients on this platform. A patient decision aid for treatment selection for lung cancer patients had been developed in the Netherlands (http://www.keuzehulp-longkanker.nl/). Patients can comprehensively consider the pros and cons of surgery and targeted radiotherapy based on the information on this website and decide together with their clinician.

Decision coaching is another form of patient decision aids, which is developed in accordance with IPADS [32]. Rahn et al. (2018) conducted a preliminary randomized controlled study in which a decision aid implemented by a nurse-led decision coach facilitated patient participation in SDM [33]. Also, there was evidence that decision coaching could avoid decision-making entanglement and improve the quality of communication with patients and facilitate their learning [34].

The MAGIC program, proposed by the British Health Foundation, has developed option grids to help patients engage with SDM [35]. Currently, treatment option grids are used in a wide range of diseases, such as breast cancer, knee joint arthritis, prostate cancer [36-38]. Study confirmed that the application of option grids in lung cancer screening could lead to better SDM experience and advanced knowledge of lung cancer screening [39]. With advances in medicine and the popularity of SDM, it is imperative to encourage lung cancer patients to participate in SDM. Healthcare professionals can use patient decision aids to help patients choose decisions that match their values, preferences, and personal goals.

Clinical implications

In the Chinese cultural context and healthcare system, clinicians lack sufficient time to explain the pros and cons of different treatments to patients. As close partners of clinicians, nurses have more contact with patients than clinicians and are more likely to provide health education and understand patients' wishes regarding treatment and care options. Transitional care is critical for chronic diseases such as cancer, and community health workers are the primary providers of transition care services in the community. Within certain limits of authority, we can train oncology nurse specialists in SDM to join medical staff-patient-family

and hospital-home-communities to provide SDM for patients. We should use SDM to maximize patient autonomy and use patient decision aids to help them make decisions.

Limitation

However, this study has the following limitations. First, this study was conducted in only one comprehensive medical center with limited sample selection. Second, shared decision-making involved not only patients but also their family members. In this study, we didn't collect the opinions from family members. Third, it is best to analyze the study results through questionnaires and interviews. Therefore, we will conduct interviews with lung cancer patients to obtain more detailed information and include patients' family members in future studies. The results of this study could inform the development of the intervention and will include additional factors as well as future family involvement.

Conclusions

Actual participation and perceived importance in SDM on treatment and care among lung cancer patients were low and there was variation between them. Lung cancer patients' actual participation in SDM on treatment and care was affected by background factors (education level, household income) and health care provider factors (lack of time, attitude towards SDM). Therefore, SDM orientation sessions should be designed accordingly to the social background of lung cancer patients to help them actively participate. Due to the limited time available to clinicians, nurses are better suited to act as a liaison between patients and physicians to provide SDM support. Thus, SDM knowledge training for oncology nurses is beneficial in facilitating SDM.

Declarations

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Conflicts of interest/Competing interests:

No conflict of financial or other interest has been declared by the authors.

Availability of data and material:

All authors declared that all data and materials as well as software application or custom code support their published claims and comply with field standards.

Code availability:

Not applicable.

Authors' contributions:

All authors contributed to the study conception and design. Study design and material preparation were performed by Ying Wang, Bo Hu, and Jinna Zhang. Data collection and analysis were performed by Ying Wang, Jinna Zhang, Bo Hu, Jizhe Wang, Laixiang Zhang, Xiaohua Li, and Xiuli Zhu. The first draft of the manuscript was written by Ying Wang, Jinna Zhang, and Bo Hu and all authors commented on previous versions of the manuscript. All authors read and approved the final manuscript.

Ethics approval:

This study was conducted according to the Declaration of Helsinki and were supported by the ethical committee of the university which the researchers affiliated.

Consent to participate:

Before distributing the questionnaires, all the patients signed the informed consents. That indicated that they understood the nature and purpose of the study and they knew that their personal information would not be divulged.

Consent for publication:

Not applicable. Because this is not a case study, but cross-sectional study. We collect data anonymously. We present the results by analysing a large number of quantitative data and there will be no information leakage of any participants.

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Tables

Table 1 Descriptive analysis of sociodemographic data and disease-related data (*N*=290)

Variables	*N* (%)	*N* / %							
		SDM on treatment				SDM on care			
		Actual participation		Perceived importance		Actual participation		Perceived importance	
		High	Low	Importance	Unimportance	High	Low	Importance	Unimportance
Gender									
Male	151 (52.1)	49 (16.9)	102 (35.2)	96 (33.1)	55 (19.0)	23(7.9)	128 (44.1)	36 (12.3)	115 (39.7)
Female	139 (47.9)	29 (10.0)	110 (37.9)	81 (27.9)	58 (20.0)	9 (3.1)	130 (44.8)	17 (5.9)	122 (42.1)
Age									
≤ 40	21 (7.2)	9 (3.1)	12 (4.1)	16 (5.5)	5 (1.7)	2 (0.7)	19 (6.6)	6 (2.1)	15 (5.2)
41 – 50	40 (13.8)	17 (5.9)	23 (7.9)	26 (9.0)	14 (4.8)	7 (2.4)	33 (11.4)	8 (2.8)	32 (11.0)
51 – 60	120 (41.4)	36 (12.4)	84 (29.0)	78 (26.9)	42 (14.5)	15 (5.2)	105 (36.2)	24 (8.3)	96 (33.1)
> 60	109 (37.6)	16 (5.5)	93 (32.1)	57 (19.7)	52 (17.9)	8 (2.8)	101 (34.8)	15 (5.2)	94 (32.4)
Marital status									
Married	267 (92.1)	71 (24.5)	196 (67.6)	160 (55.2)	107 (36.9)	27 (9.3)	240 (82.8)	46 (15.9)	221 (76.2)
Other	23 (8.9)	7 (2.4)	16 (5.5)	17 (5.9)	6 (2.1)	5 (1.7)	18 (6.2)	7 (2.4)	16 (5.5)
Comorbidities									
No	215 (74.1)	60 (20.7)	155 (53.4)	130 (44.8)	85 (29.3)	21 (7.2)	194 (66.9)	34 (11.7)	181 (62.4)
Yes	75 (25.9)	18 (6.2)	57 (19.7)	47 (16.2)	28 (9.7)	11 (3.8)	64 (22.1)	19 (6.6)	56 (19.3)
Medical insurance									
Employee health insurance	141 (48.6)	40 (13.8)	101 (34.8)	92 (31.7)	49 (16.9)	19 (6.5)	122 (42.1)	31 (10.7)	110 (37.9)
Resident health insurance	125 (43.1)	31 (10.7)	94 (32.4)	72 (24.8)	53 (18.3)	11 (3.8)	114 (39.3)	20 (6.9)	105 (36.2)
Own expense	24 (8.3)	7 (2.4)	17 (5.9)	13 (4.5)	11 (3.8)	2 (0.7)	22 (7.6)	2 (0.7)	22 (7.6)
Education level									
Illiteracy / Primary school	81 (27.9)	8 (2.8)	73 (25.2)	39 (13.4)	42 (14.5)	3 (1.0)	78 (26.9)	9 (3.1)	72 (24.8)
Junior high school	111 (38.3)	32 (11.0)	79 (27.2)	66 (22.8)	45 (15.5)	11 (3.8)	100 (34.5)	14 (4.8)	97 (33.4)
High school	49 (16.9)	14 (4.8)	35 (12.1)	37 (12.8)	12 (4.1)	6 (2.1)	43 (14.8)	12 (4.1)	37 (12.8)

Junior college	20 (6.9)	9 (3.1)	11 (3.8)	13 (4.5)	7 (2.4)	3 (1.0)	17 (5.9)	7 (2.4)	13 (4.5)
Bachelor degree and above	29 (10.0)	15 (5.2)	14 (4.8)	22 (7.6)	7 (2.4)	9 (3.1)	20 (6.9)	11 (3.8)	18 (6.2)
Number of children									
≤ 1	129 (44.5)	38 (13.1)	91 (31.4)	94 (32.4)	35 (12.1)	12 (4.1)	117 (40.3)	27 (9.3)	102 (35.2)
2	129 (44.5)	30 (10.3)	99 (34.1)	65 (22.4)	64 (22.1)	13 (4.5)	116 (40.0)	17 (5.9)	112 (38.6)
≥ 3	32 (11.0)	10 (3.4)	22 (7.6)	19 (6.3)	14 (4.7)	7 (2.4)	25 (8.6)	9 (3.1)	23 (7.9)
Income (RMB)									
< 3000	9 (3.1)	0 (0.0)	9 (3.1)	2 (0.7)	7 (2.4)	0 (0.0)	9 (3.1)	2 (0.7)	7 (2.4)
3000 – 5000	76 (26.2)	11 (3.8)	65 (22.4)	31 (10.7)	45 (15.5)	3 (1.0)	73 (25.2)	5 (1.7)	71 (24.5)
5001 – 10000	175 (60.3)	54 (18.6)	121 (41.7)	118 (40.7)	57 (19.7)	22 (7.6)	153 (52.8)	34 (11.7)	141 (48.6)
> 10000	30 (10.3)	13 (4.5)	17 (5.9)	26 (9.0)	4 (1.4)	7 (2.4)	23 (7.9)	12 (4.1)	18 (6.2)
Personality									
Introvert	200 (69.0)	52 (17.9)	148 (51.0)	127 (43.8)	73 (25.2)	14 (4.8)	186 (64.1)	32 (11.1)	168 (57.9)
Extrovert	90 (31.0)	26 (9.0)	64 (22.1)	50 (17.2)	40 (13.8)	18 (6.2)	72 (24.8)	21 (7.2)	69 (23.8)
Course of disease									
< 3 months	120 (41.4)	30 (10.3)	90 (31.0)	87 (30.0)	33 (11.4)	6 (2.1)	114 (39.3)	20 (6.9)	100 (34.5)
3 – 6 months	108 (37.2)	6 (2.1)	102 (35.2)	40 (13.8)	68 (23.4)	4 (1.3)	104 (35.9)	7 (2.4)	101 (34.8)
> 6 months	62 (21.4)	42 (14.5)	20 (6.9)	50 (17.3)	12 (4.1)	22 (7.6)	40 (13.8)	26 (9.0)	36 (12.4)
Pathological typing									
□	48 (16.6)	11 (3.8)	37 (12.8)	34 (11.7)	14 (4.9)	5 (1.8)	43 (14.8)	9 (3.2)	39 (13.4)
□	122 (42.1)	32 (11.0)	90 (32.1)	80 (27.6)	42 (14.5)	9 (3.1)	113 (39.0)	17 (5.9)	105 (36.2)
□	83 (28.6)	14 (4.8)	69 (23.8)	36 (12.4)	47 (16.2)	4 (1.4)	79 (27.2)	8 (2.7)	75 (25.9)
□	37 (12.8)	21 (7.2)	16 (5.6)	27 (9.3)	10 (3.5)	14 (4.9)	23 (7.9)	19 (6.6)	18 (6.2)

Note: SDM: shared decision-making

Table 2 Multi-factor prediction of actual participation in SDM on treatment.

Characteristics	OR	95% CI	*P*
Demographic characteristics			
Gender	1.994	1.108 – 3.587	0.021*
Age	1.040	1.006 – 1.075	0.019*
Marital status	0.564	0.184 – 1.616	0.274
Medical insurance			
Employee health insurance	Reference		0.279
Resident health insurance	0.638	0.335 – 1.215	0.171
Own expense	0.497	0.161 – 1.529	0.223
Education level	0.656	0.508 – 0.846	0.001**
Income (□)	0.458	0.281 – 0.747	0.002**
Disease-related factors			
Course of disease			
< 3 months	Reference		<0.01**
3 – 6 months	5.845	2.252 – 15.167	<0.01**
> 6 months	0.162	0.077 – 0.337	<0.01**
Pathological typing			
□	Reference		0.008**
□	0.673	0.281 – 1.609	0.373
□	1.521	0.543 – 4.259	0.424
□	0.244	0.079 – 0.753	0.014*

Note: OR: odds ratio; CI: Confidence intervals. ** Indicates statistical significance at p≤0.01. * Indicates statistical significance at $P \leq 0.05$. Demographic characteristics: Omnbius Tests of model Coefficients: $P \leq 0.01$; The Hosmer-Lemeshow Goodness-of-Fit Test: $\chi^2 = 8.764$□$P = 0.363$; Disease-related factors: Omnbius Tests of model Coefficients: $P \leq 0.01$; The Hosmer-Lemeshow Goodness-of-Fit Test: $\chi^2 = 6.879$, $P = 0.332$. SDM: Shared decision-making.

Table 3 Multi-factor prediction of perceived importance of SDM on treatment.

Characteristics	OR	95% CI	*P*
Demographic characteristics			
Marital status	0.253	0.085 – 0.754	0.014*
Education level	0.763	0.606 – 0.961	0.021*
Number of children	1.499	0.999 – 2.249	0.051
Income	0.356	0.229 – 0.553	<0.01**
Disease-related factors			
Course of disease			
< 3 months	Reference		<0.01**
3 – 6 months	3.944	2.207 – 7.049	<0.01**
> 6 months	0.562	0.256 – 1.233	0.151
Pathological typing			
□	Reference		0.020*
□	1.015	0.469 – 2.199	0.969
□	2.463	1.080 – 5.618	0.032*
□	0.883	0.311 – 2.511	0.816

Note: OR: odds ratio; CI: Confidence intervals. ** Indicates statistical significance at $P \leq 0.01$. * Indicates statistical significance at $P \leq 0.05$. Demographic characteristics: Omnbius Tests of model Coefficients: $P \leq 0.01$; The Hosmer-Lemeshow Goodness-of-Fit Test: $\chi^2 = 2.852$, P=0.898; Disease-related factors: Omnbius Tests of model Coefficients: $P \leq 0.01$; The Hosmer-Lemeshow Goodness-of-Fit Test: $\chi^2 = 2.388$, $P = 0.935$. SDM: Shared decision-making.

Table 4 Multi-factor prediction of actual participation in SDM on care.

Characteristics	OR	95% CI	*P*
Demographic characteristics			
Education level	0.575	0.425 – 0.778	<0.01**
Number of children	0.361	0.184 – 0.706	0.003**
Income (□)	0.347	0.180 – 0.670	0.002**
Personality	0.244	0.106 – 0.558	0.001**
Disease-related factors			
Course of disease			
< 3 months	Reference		<0.01**
3 – 6 months	1.255	0.330 – 4.769	0.739
> 6 months	0.104	0.037 – 0.295	<0.01**
Pathological typing			
□	Reference		0.002**
□	1.571	0.454 – 5.441	0.476
□	3.325	0.754 – 14.660	0.113
□	0.328	0.090 – 1.195	0.328

Note: OR: odds ratio; CI: Confidence intervals. ** Indicates statistical significance at $p \leq 0.01$. * Indicates statistical significance at $P \leq 0.05$; Demographic characteristics: Omnbius Tests of model Coefficients: $P \leq 0.01$; The Hosmer-Lemeshow Goodness-of-Fit Test: $\chi^2 = 13.090$, $P = 0.109$; Disease-related factors: Omnbius Tests of model Coefficients: $P \leq 0.01$; The Hosmer-Lemeshow Goodness-of-Fit Test: $\chi^2 = 4.738$, $P = 0.692$. SDM : Shared decision-making.

Table 5 Multi-factor prediction of perceived importance of SDM on care.

Characteristics	OR	95% CI	*P*
Demographic characteristics			
Gender	2.302	1.175 – 4.513	0.015*
Marital status	0.320	0.109 – 0.936	0.037*
Education level	0.625	0.487 – 0.801	<0.01**
Income	0.500	0.301 – 0.830	0.007**
Disease-related factors			
Course of disease			
< 3 months	Reference		<0.01**
3 – 6 months	2.945	1.135 – 7.641	0.026*
> 6 months	0.329	0.153 – 0.708	0.004**
Pathological typing			
□	Reference		0.001**
□	1.311	0.520 – 3.303	0.566
□	2.110	0.703 – 6.330	0.183
□	0.251	0.086 – 0.727	0.011*

Note: OR: odds ratio; CI: Confidence intervals. ** Indicates statistical significance at $P \leq 0.01$. * Indicates statistical significance at $P \leq 0.05$. Demographic characteristics: Omnbius Tests of model Coefficients: $P \leq 0.01$; The Hosmer-Lemeshow Goodness-of-Fit Test: $\chi^2 = 10.207$, $P = 0.177$; Disease-related factors: Omnbius Tests of model Coefficients: $P \leq 0.01$; The Hosmer-Lemeshow Goodness-of-Fit Test: $\chi^2 = 1.617$, $P = 0.951$. SDM: Shared decision-making.

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