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RESEARCH

The relationship between medication adherence and illness perception in breast cancer patients with adjuvant endocrine therapy: beliefs about medicines as mediators

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Abstract

Purpose To describe medication adherence, to analyze the relationships among medication adherence, illness perception, and beliefs about medicines, and to determine the mediating effects of beliefs about medicines on the relationship in breast cancer patients with adjuvant endocrine therapy (AET) in China.

Methods A cross-sectional study was conducted on 202 breast cancer patients with AET from September 2017 to February 2019 in China. The Medication Adherence Report Scale (MARS-5), the Chinese version of the revised illness perception questionnaire for Breast Cancer (CIPQ-R-BC) and the Beliefs about Medicines Questionnaire (BMQ) were used.

Results The mean MARS-5 score of our participants was 23.72 (SD = 1.62), and 175 (86.6%) patients were adherent to medications. Moreover, medication adherence was negatively correlated with identity, environmental or immune factors, emotional representations, BMQ-specific concerns, BMQ-general overuse, and BMQ-general harm, as well as being positively correlated with coherence and the total BMQ scores. Furthermore, beliefs in the overuse about medicines functioned as mediators for the influencing effects of coherence and emotional representations on medication adherence.

Conclusion Illness perception not only directly affected medication adherence, but also indirectly affected medication adherence through the beliefs about medicines. Necessary interventions that target beliefs in the overuse about medicines in breast cancer patients with AET with low levels of coherence or high levels of emotional representations could be provided to improve the level of their medication adherence.

Keywords Breast cancer · Adjuvant endocrine therapy · Medication adherence · Illness perception · Beliefs about medicines

Introduction

Breast cancer is the most common cancer in women worldwide, accounting for 24.5% of all cancer cases among women [1]. The condition is even more critical in China, wherein the number of new cases of breast cancer ranks first throughout the world [2]. Meanwhile, approximately 70–80% of diagnosed breast cancer patients are hormone receptor-positive (estrogen receptor-positive [ER +] and/or progesterone receptor-positive [PR +]) [3]. Adjuvant endocrine therapy (AET) is routinely recommended for hormone receptor-positive breast cancer patients and has been shown to significantly reduce the recurrence rate by 40% [4]. According to the American Society of Clinical Oncology (ASCO) Clinical Practice Guideline [5], AET should be conducted for 5 to 10 years after the primary treatment of breast cancer for hormone receptor-positive patients.

Adherence to medication is a primary determinant of the efficacy of AET. "Adherence" is defined as the extent to which a person's behavior corresponds with agreed recommendations from health care providers, including taking

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medication [6]. Another two relevant terms are "compliance" and "concordance." "Compliance" refers to the extent to which a person's behavior matches prescribed by their health care provider [7]. "Compliance" ignores patient participation in treatment advice [8]. "Concordance" highlights an equitable relationship between physician and patient. Nowadays, the concept of "adherence" is more widely accepted. Low medication adherence remains a particularly important challenge that prevents the achievement of expected outcomes in breast cancer patients with AET [9, 10]. However, it has been shown that the medication adherence of breast cancer patients undergoing endocrine therapy is often suboptimal. According to a systematic literature review conducted with breast cancer patients [11], the prevalence of adherence to AET over a 5-year treatment period ranged from 33.3 to 88.6%. Some factors related to the adherence to AET have been identified in several studies. Psychosocial factors, such as illness perception and beliefs about medicines, may be substantial predictors of medication adherence [12, 13].

Illness perception is a modifiable factor and refers to an individual's thoughts and feelings about his or her illness [14]. The self-regulation model (SRM) provides a framework for explaining how patients understand their disease, and their perceptions of illness would regulate their coping behaviors including adherence to medication [15]. Illness perception comprises the following nine dimensions: identity, causes, timeline acute/chronic, consequences, personal control, treatment control, coherence, timeline cyclical, and emotional representations [16]. Studies on the relationship between illness perception and medication adherence have been widely conducted in chronic disease populations [17]. For breast cancer patients with AET, the study of Sun et al. [18] proposed that the treatment control dimension was positively related to medication adherence, whereas identity, timeline acute/chronic, consequences, and emotional representations were negatively associated with medication adherence. This is similar to another study in Indonesia, which reported that more negative illness perceptions (i.e., a more threatening view of illness) were associated with lower medication adherence [19].

Alongside illness perception, beliefs about medicines are considered to be another key predictor of medication adherence [20]. Horne and Weinman [21] proposed that SRM can expand its ability to explain medication adherence by increasing attention to beliefs about medicines. Beliefs about medicines include the persons' general perceptions of medicines, as well as perceptions of medicines in specific conditions such as AET [22]. The general beliefs comprise harm and overuse domains, and the specific beliefs reflecting patients' perceived benefits and costs of medication adherence include necessity and concerns domains [22]. When beliefs in necessity outweigh beliefs in concerns about medicines, patients present with adherence [23]. Consequently, previous studies have shown that beliefs about medicines influence medication adherence among different chronic disease populations [24]. Similar results have also been observed in breast cancer patients with AET; specifically, medication adherence has been shown to be positively related to necessity beliefs but negatively related to concerns beliefs [25, 26].

Furthermore, the interaction between illness perception and beliefs about medicines has been explored in chronic disease populations, and beliefs about medicines may act as mediators to modulate the relationship between illness perception and medication adherence. In the study by Horne and Weinman [21] in asthma patients, the timeline acute/chronic dimension indirectly affected medication adherence through beliefs in the necessity about medicines; additionally, the consequences dimension was both directly related to medication adherence and indirectly associated with it, as mediated by the necessity beliefs about medicines. Similar results were found in a study by Nicklas et al. [12] in patients with chronic pain. They found that the consequences dimension was indirectly related to medication adherence through the mediation of the necessity and concerns beliefs about medicines, and the emotional representations dimension was indirectly associated with medication adherence through the mediation of the concerns beliefs about medicines. However, no studies have evaluated the relative contributions of illness perception and beliefs about medicines to medication adherence among Chinese breast cancer patients with AET.

Thus, the objectives of this study were (1) to describe medication adherence among breast cancer patients with AET, (2) to identify the relationship between medication adherence, illness perception and beliefs about medicines among breast cancer patients with AET, and (3) to explore the mediating role of beliefs about medicines between illness perception and medication adherence among breast cancer patients with AET.

Methods

Design

This was a cross-sectional study.

Participants

This study was conducted at the breast outpatient clinics of a cancer hospital in Guangzhou, China. By using convenience sampling, a total of 220 participants were recruited from September 2017 to February 2019. Women were eligible for the study if they complied with the following criteria: (1) initially diagnosed with breast cancer, (2) with ER + and/

or PR + tumors, (3) received adjuvant endocrine therapy at least one year, and (4) provided informed consent. Patients with recurrences or metastases, other severe diseases or who were participating in drug trials were excluded. According to the requirements for structural equation modeling (SEM), a sample size of 200 was determined [27].

Measurements

Demographic and clinical data

A self-designed general information questionnaire was used to collect demographic data, including age, education level, marital status, family monthly income per person, and payment methods for medical expenses. Clinical data, which were accessed from medical records, included cancer stage, the initial endocrine agents, and a history of benign breast disease.

Medication adherence

The Chinese version of the Medication Adherence Report Scale (MARS-5) [28] was used to evaluate medication adherence in the present study. The MARS-5 is a 5-item scale for the assessment of self-reported medication adherence, which classifies nonadherent behavior into unintentional (forgetting to take the medicine) and intentional (the other alternatives). Each item is measured via a 5-point Likert scale from 1(always) to 5(never), and the total score ranges from 5 to 25. Although there is no gold standard, a cutoff point at ≥ 23 is commonly applied and considered to indicate adherence [29]. The Cronbach's α of the MARS-5 ranged from 0.67 to 0.89 in a range of chronic illnesses [30].

Illness perception

Illness perception was evaluated by using the Chinese version of the Revised Illness Perception Questionnaire for breast cancer (CIPQ-R-BC) [31]. The questionnaire comprises three sections: First, the identity dimension contains 16 symptoms related to breast cancer, and patients responded "Yes (scored 1)" or "No (scored 0)" based on their own beliefs. Second, the causes dimension is composed of 33 items showing 6 possible factors, such as psychological factors, genetic or estrogen factors, environmental or immune factors, behavioral factors, uncontrollable factors, and metabolic comprehensive factors. It was scored on a 5-point Likert scale from 1 (disagree completely) to 5 (agree completely). Third, the latter seven dimensions (timeline acute/chronic, consequences, personal control, treatment control, coherence, timeline cyclical and emotional representations) include 38 items, and three acts as a neutral point [32]. According to the Cronbach's α coefficients (0.62–0.87) and content validity (Item of Content Validity Index, I-CVI = 0.78–1.00; Scale of Content Validity Index, S-CVI = 0.98–0.99), the CIPQ-R-BC was deemed to be reliable [31].

Beliefs about Medicines

The Beliefs about Medicines Questionnaire (BMQ) [22] was selected to assess beliefs about medicines of patients who received endocrine therapy in this study. It includes the following two sections: BMQ-general (8 items) and BMQ-specific (10 items), and each item uses a 5-point Likert scale. The BMQ-general section with two 4-item subscales demonstrates patients' beliefs about the manner in which doctors prescribe medicines (BMQ-general overuse) and that the medicine is harmful to the body (BMQ-general harm). The BMQ-specific section includes two 5-item subscales: BMQ-specific necessity and BMQ-specific concerns subscales. The difference between the necessity score and the concerns score represents the level of the patient's beliefs about medicines, which ranges from − 20 to 20. In this study, the Chinese version of the BMQ translated by Wu Mibin [33] was used, and the Cronbach's α of the total scale was 0.738.

Procedure

The data were collected face-to-face by the first author, and patients were given a clear explanation of the study. After signing the informed consent form, patients were asked to complete questionnaires by themselves, including a self-designed general information questionnaire, MARS-5, CIPQ-R-BC and BMQ. All of the questionnaires were returned on the spot and were checked immediately.

Statistical analysis

SPSS 25.0 and AMOS 26.0 software were used for the data analysis. Statistical tests were two-sided, and $P < 0.05$ was considered to be statistically significant.

Descriptive statistics were performed for demographic and clinical data, medication adherence, illness perception, and beliefs about medicines. For the two group comparisons (adherent vs nonadherent), we used the independent samples *t* test. A Pearson's correlation test was selected to investigate the associations among medication adherence, illness perception, and beliefs about medicines. Finally, the SEM was conducted to confirm the mediating role of beliefs about medicines between illness perception and medication adherence. A bias-corrected bootstrap (with 5000 random samples) was used to estimate the 95% confidence intervals (95% *CIs*) of the coefficients for the direct, indirect, and total effects. The results were considered to be statistically significant if the 95% *CIs* did

not overlap zero [34]. A $\chi 2$/degrees of freedom (df) ratio < 3.0, root mean square of approximation (RMSEA) values < 0.08, standardized root mean square residual (SRMR) < 0.08, and confirmatory fit index (CFI) and Tucker-Lewis index (TLI) ≥ 0.9 indicated an acceptable model fit [35].

Results

Sample characteristics

Eight questionnaires with missing values > 20% were removed. Thus, a total of 202 valid questionnaires were obtained, with an effective recovery rate of 96.2%. The demographic and clinical characteristics are exhibited in Table 1. The mean age was 45.10 years (SD = 9.99, range = 26–75 years). Most of the patients had a junior middle school education or above (93.6%). A total of 87.1% of patients had given birth, and more than 70% of the samples had breastfed. Moreover, the major method for medical payment was medical insurance (65.3%).

Medication adherence, illness perception, and beliefs about medicines

The mean MARS-5 score was 23.72 (SD = 1.62), and 175 (86.6%) patients were adherent (MARS-5 score ≥ 23). The highest scoring item was "I will change the dose of the medicine" with a score of 4.98 ± 0.21, and the lowest was "I forget to take the medicine," with a score of 4.22 ± 0.72.

The results from the CIPQ-R-BC and BMQ are shown in Table 2. When regarding illness perception (CIPQ-R-BC), the mean score of the identity dimension was 2.72 (SD = 1.93). The symptom that most patients believed correlated with breast cancer was a breast lump with no pain (63.4%). The score of 3.67 for psychological factors (SD = 0.63) was higher than other factors in the causes dimension, whereas the metabolic comprehensive factors obtained the lowest score of 2.61 (SD = 0.70). Furthermore, the mean scores of the timeline acute/chronic, consequences, personal control, treatment control, and coherence dimensions were significantly greater than 3, whereas the mean score of timeline cyclical was significantly lower than 3. In addition, the score of the coherence dimension was significantly higher in the adherent group compared to the nonadherent group.

Table 1 Demographic and clinical characteristics of participants ($N = 202$)

Variable	Categories	N	%
Age	< 40 years	64	31.7
	40 ~ 49 years	87	43.1
	50 ~ 59 years	28	13.8
	≥ 60 years	23	11.4
Education	Primary school	13	6.4
	Junior middle school	48	23.8
	High school	61	30.2
	College or more	80	39.6
Marital status	Married	164	81.2
	Single/divorced/widowed	38	18.8
Family monthly income per person	< 4000 yuan (≈ 571 dollars)	34	16.8
	4000 ~ 6000 yuan (≈ 571 ~ 856 dollars)	78	38.6
	> 6000 yuan (≈ 856 dollars)	90	44.6
Payment methods for medical expenses	Self-funded	54	26.7
	Medical insurance	132	65.3
	Publicly-funded	16	7.9
Fertility	Multipara	176	87.1
	Nullipara	26	12.9
Breastfed or not	Yes	146	72.3
	No	56	27.7
Cancer stage	I	82	40.6
	II	88	43.6
	III	32	15.8
The initial endocrine agents	Tamoxifen	99	49.0
	Aromatase inhibitor	45	22.3
	Toremifene	48	23.8
	Others	10	5.0
Whether to take other medications	Yes	57	28.2
	No	145	71.8
History of benign breast disease	Yes	76	37.6
	No	126	62.4

Table 2 Scores of CIPQ-R-BC and BMQ ($N=202$)

Scale/subscale	Whole sample ($N=202$) Mean (SD)	Adherent [MARS-5 score ≥ 23] ($N=175$) Mean (SD)	Nonadherent [MARS-5 score < 23] ($N=27$) Mean (SD)	P
CIPQ-R-BC				
Identity	2.72 (1.93)	2.65 (1.72)	3.15 (2.96)	0.214
Timeline acute/chronic	3.10 (0.54)	3.09 (0.55)	3.22 (0.49)	0.255
Consequences	3.17 (0.51)	3.14 (0.51)	3.31 (0.50)	0.124
Personal control	3.31 (0.41)	3.31 (0.41)	3.36 (0.40)	0.552
Treatment control	3.71 (0.42)	3.70 (0.43)	3.76 (0.32)	0.456
Coherence	3.28 (0.58)	3.32 (0.58)	3.04 (0.59)	0.024
Timeline cyclical	2.36 (0.64)	2.36 (0.67)	2.34 (0.49)	0.871
Emotional representations	2.97 (0.73)	2.93 (0.74)	3.22 (0.60)	0.059
Causes				
Psychological factors	3.67 (0.63)	3.63 (0.62)	3.93 (0.65)	0.017
Genetic or estrogen factors	3.04 (0.53)	3.04 (0.53)	3.05 (0.55)	0.941
Environmental or immune factors	3.28 (0.56)	3.24 (0.54)	3.55 (0.62)	0.009
Behavioral factors	2.91 (0.72)	2.91 (0.71)	2.91 (0.77)	0.999
Uncontrollable factors	2.94 (0.53)	2.93 (0.53)	2.98 (0.50)	0.688
Metabolic comprehensive factors	2.61 (0.70)	2.61 (0.71)	2.62 (0.64)	0.920
BMQ				
Total scores	1.49 (3.30)	1.65 (3.37)	0.48 (2.64)	0.088
BMQ-specific necessity	16.94 (2.79)	16.92 (2.83)	17.07 (2.53)	0.790
BMQ-specific concerns	15.45 (2.81)	15.27 (2.79)	16.59 (2.68)	0.023
BMQ-general overuse	10.99 (1.86)	10.76 (1.77)	12.44 (1.78)	< 0.001
BMQ-general harm	11.25 (1.70)	11.18 (1.69)	11.70 (1.75)	0.135

For beliefs about medicines (BMQ), the mean score was 1.49 (SD = 3.30). The score of BMQ-specific necessity was higher than that of BMQ-specific concerns, thus indicating that our patients have positive beliefs about medicines. Meanwhile, the scores of BMQ-specific concerns and BMQ-general overuse were significantly higher in the nonadherent group.

The relationship between medication adherence, illness perception, and beliefs about medicines

Table 3 depicts the relationship between medication adherence, illness perception and beliefs about medicines. Medication adherence was negatively correlated with identity ($r=-0.239$, $P=0.001$), environmental or immune factors ($r=-0.223$, $P=0.001$), emotional representations ($r=-0.150$, $P=0.033$), BMQ-specific concerns ($r=-0.198$, $P=0.005$), BMQ-general overuse ($r=-0.339$, $P<0.001$), and BMQ-general harm ($r=-0.211$, $P=0.003$) and was positively correlated with coherence ($r=0.222$, $P=0.002$) and the total BMQ scores ($r=0.174$, $P=0.013$).

Beliefs about medicines acting as mediators

The model is presented in Fig. 1. It fit the data well: $\chi^2/df = 0.551$, $P = 0.577$, RMSEA = 0.000, SRMR = 0.018, CFI = 1.000, and TLI = 1.060. First, the direct path "coherence → medication adherence" and the indirect path "coherence → BMQ-general overuse → medication adherence" were significant (direct effect $\beta=0.161$, 95% $CI=0.001$~0.311, $P=0.049$; indirect effect $\beta=0.038$, 95% $CI=0.005$~0.092, $P=0.023$). Therefore, the total effect of coherence on medication adherence was the sum of the direct and indirect effects $0.161+0.038=0.199$. Second, the indirect path "emotional representations → BMQ-general overuse → medication adherence" was significant (indirect effect $\beta=$-0.038, 95% $CI=$-0.130~-0.009, $P=0.038$), whereas the direct path "emotional representations" → "medication adherence" and the indirect path "emotional representations" → "BMQ-specific concerns" → "medication adherence" were not significant. Thus, the total effect of emotional representations on medication adherence was -0.038.

Discussion

To our knowledge, this was the first study to explore the relationships among medication adherence, illness perception and beliefs about medicines in breast cancer patients with AET and to determine whether beliefs about

Table 3 The relationships between medication adherence, illness perception, and beliefs about medicines ($N = 202$)

Scale/subscale	MARS-5
CIPQ-R-BC	
Identity	−0.239**
Timeline acute/chronic	−0.040
Consequences	−0.128
Personal control	0.021
Treatment control	0.024
Coherence	0.222**
Timeline cyclical	0.016
Emotional representations	−0.150*
Causes	
Psychological factors	−0.133
Genetic or estrogen factors	−0.056
Environmental or immune factors	−0.223**
Behavioral factors	−0.057
Uncontrollable factors	−0.055
Metabolic comprehensive factors	−0.021
BMQ	
Total BMQ	0.174*
BMQ-specific necessity	0.006
BMQ-specific concerns	−0.198**
BMQ-general overuse	−0.339**
BMQ-general harm	−0.211**

*$P < 0.05$, **$P < 0.01$

medicines act as mediators in that relationship. Our study showed that illness perception and beliefs about medicines were related to medication adherence and that beliefs about medicines functioned as mediators for the influencing effects of illness perception on medication adherence.

In this study, the proportion of patients with a high level of medication adherence reached 86.6%, which was higher than that in previous studies [36–38]. This may be due to the use of various medication adherence instruments. For example, Deng [39] used the 8-item Morisky Medication Adherence Questionnaire (MMAS-8) and found that 65.2% of participants had high and medium levels of adherence. Furthermore, social desirability bias may also result in patients over-reporting medication adherence. Although we attempted to minimize bias by informing the participants that the data were anonymous, patients might conceal the fact of nonadherence when they were approached by data collector in a face-to-face way. The mean score of MARS-5 was 23.72 (SD = 1.62), which was slightly lower than the research by Jacobs et al. [40]. This might be explained by different health care system in China and the USA.

Meanwhile, we must recognize that implicit unintentional nonadherence and more explicit intentional nonadherence existed in the present study. In this study, our patients mainly manifested unintentional nonadherence (forgetting to take the medicine) as in previous studies [26, 41]. This notion suggests that it is not the fact that the patients do not want to take the medicine, and that health care staff can intervene in the patient's action of forgetting to take the medicine and provide them with advice on avoiding the act of forgetting to take the medicine. This involves actions such as formulating a medication calendar, setting an alarm clock, purchasing a pill bottle with the function of reminding them to take the medicines, or

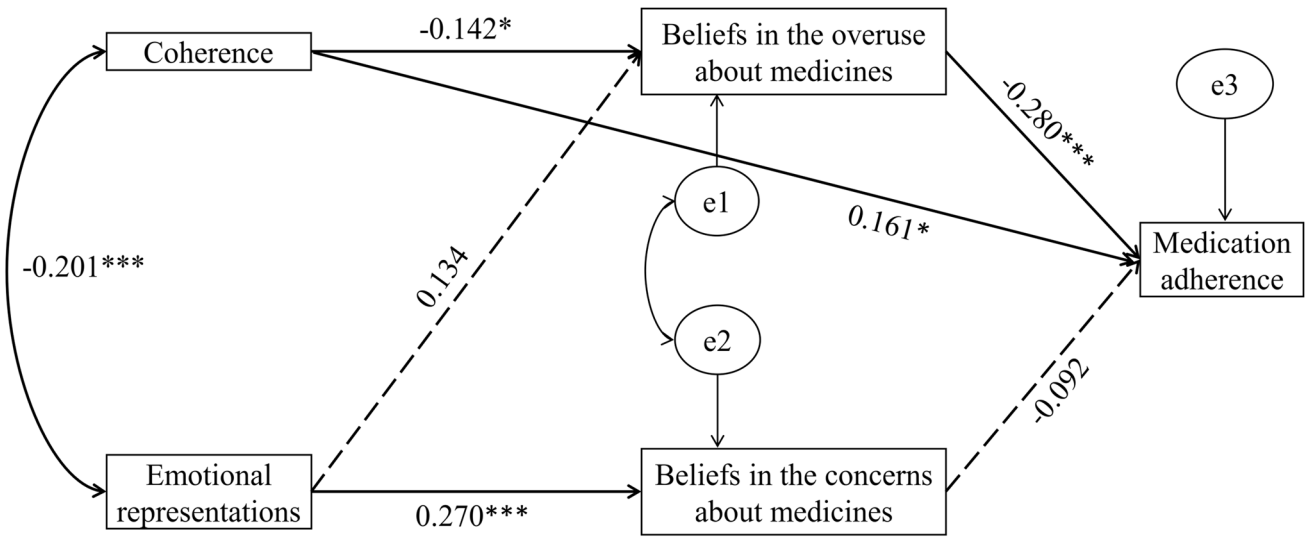

Fig. 1 Structural equation model of beliefs about medicines as mediators of illness perception and medication adherence among breast cancer patients on AET. * $P < 0.05$, *** $P < 0.001$

inviting them to join a WeChat (Tencent Holdings Ltd., Shenzhen, China) group to supervise the behavior of taking their medications.

More importantly, when regarding adherence, WHO recommended that patients need support rather than education or blame [6]. As adherence is complex, Steiner and Earnest [8] supposed that we must evaluate what patients are doing and understand their motivation if we attempt to support them. In line with previous study [42], our study reflected that the medical professionals should identify patients' illness perception and beliefs about medicines in their attempt to improve patients' medication adherence.

When regarding illness perception, in agreement with previous study [43], a low score was found in the identity dimension, which indicated that the patients did not obtain enough knowledge of breast cancer-related symptoms. Furthermore, in line with Ma's [43] research, our patients believed that this illness was less cyclical and controllable through treatment and personal efforts; however, in contrast, our patients perceived themselves to have adequate knowledge of breast cancer. This may be because our participants had longer duration of illness. In addition, our results showed that some dimensions of illness perceptions were correlated with medication adherence. As shown in Table 3, patients who perceived a higher level of emotional representations had lower medication adherence, which was consistent with the study by Sun [18]. Thus, medical staff should pay attention to the impact of emotional factors on patients, and help them to maintain good emotional states. Moreover, the coherence dimension was positively correlated with medication adherence, as was observed in the study by Corter [36], indicating that the patients believed that greater knowledge about the disease corresponded to a higher level of medication adherence. This result revealed that a sufficient understanding of the illness had an important impact on medication adherence, and medical professionals should focus on raising patient awareness of the disease.

In terms of beliefs about medicines, the mean score was 1.49 (SD = 3.30), thus suggesting that our participants had positive beliefs about medicines. This was in line with previous study [36]. Similar to other studies [25, 44], we found that patients who had more concerns, perceived overuse and harmfulness of medicines were more likely to exhibit a low level of medication adherence. A low level of medication adherence has been attributed to misbeliefs about medicines in most cases [23]. Therefore, medication adherence might benefit from reframing rational beliefs about medicines.

About the SEM, distinct from Horne and Weinman's model [21] in asthma patients, we included coherence and emotional representations dimensions, which were significantly associated with beliefs about medicines at the bivariate level. To summarize this model, illness perception had both direct and indirect effects on medication adherence. For direct effects, coherence had direct effects on medication adherence, revealing that patients with poorer understandings about their illness tended to be less adherent. For indirect effects, patients with poorer understandings about their illness or with a higher level of emotional representations expressed more beliefs in the overuse about medicines, with the result being that they were less likely to adhere to the medicines. Therefore, these findings suggest that addressing beliefs in the overuse about medicines among people with these illness perceptions (with a view of reframing their beliefs) may have a beneficial impact on their medication adherence behavior.

However, our study still had several limitations. First, this was a single-center survey, which may limit the representativeness of the sample and the generalizability of the results. Second, this was a cross-sectional study, and further longitudinal studies are expected to explore the mutual impact of the results over time. Finally, self-report questionnaires are the most commonly used method for the measurements of medication adherence, which may lead to the overestimation of medication adherence [45]. In the future, a combination of self-report questionnaires and objective methods may be needed for more accurate measurements of medication adherence.

Medical professionals should be informed that adherence is a complex aspect of human behavior, and illness perception and beliefs about medicines played important roles in medication adherence in breast cancer patients with AET. This study also paves the way for interventions based on the illness perception and beliefs about medicines to be developed in order to enhance medication adherence among breast cancer patients with AET.

Conclusion

In this study, both illness perception and beliefs about medicines played important roles in medication adherence in breast cancer patients with AET. Our results highlighted that coherence has direct effects on medication adherence, and in the meantime, coherence and emotional representations could influence medication adherence through the mediating role of beliefs in the overuse about medicines.

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Declarations

Ethics approval This study was performed in line with the principles of the Declaration of Helsinki. Approval was granted by the Research Ethical Committee of the Sixth Affiliated Hospital of Sun Yat-Sen University (L2019ZSLYEC-001).

Consent to participate All participants included in the study provided written informed consent.

Consent for publication Information is anonymized and the submission does not include images that may identify the person.

Conflict of interest The authors declare no competing interests.

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