Systematic Review of Pharmacological Treatment Preferences in Patients with Depression Based on Discrete Choice Experiments and Best-Worst Scaling (Post-print)

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Abstract

Background: Antidepressants constitute one of the primary therapeutic modalities for depression, and comprehensive consideration of patient preferences can effectively enhance medication adherence. While several studies have explored drug selection preferences among patients with depression, no research has yet systematically collated and synthesized these preferences. Objective: To systematically review studies employing discrete choice experiment (DCE) and best-worst scaling (BWS) methodologies to investigate medication treatment preferences in patients with depression, thereby providing reference for rational clinical pharmacotherapy and future preference research. Methods: Using keywords including “DCE”, “BWS”, “depression”, “抑郁症”, “离散选择实验”, and “优劣尺度法”, we conducted systematic searches across six databases (CNKI, Wanfang, VIP, PubMed, Web of Science, and Embase) to identify DCE and BWS studies on drug selection preferences of depression patients published before December 31, 2021. Data extraction was performed on included studies, and quality assessment was conducted using the PREFS checklist. Attributes were categorized into outcome, process, and cost indicators, and the relative importance of each attribute category on patient medication preferences was evaluated. Results: Seven studies were included, all of which were DCE studies. Outcome attributes were incorporated with the highest frequency, followed by process and cost attributes. Synthesis of attribute categories and their relative importance weights across the seven studies revealed that outcome attributes were the most important, followed by cost and process attributes. According to the PREFS checklist, one study scored 4 points and six studies scored 3 points. Most studies required further improvement in the domains of Respondents and Findings. Conclusion: Outcome attributes are paramount in the medication process of depression patients, such as disease remission rates and

weight gain. Clinicians and decision-makers should attend to this consideration and fully incorporate patient preferences and intentions when determining clinical treatment regimens. Existing studies still have room for improvement in dimensions such as reporting of sample differences and experimental design, including reporting differences between respondents and non-respondents, elaborating on whether significant differences exist between included and excluded patients, and selecting appropriate survey modalities. In future research, investigators are recommended to further refine study design in aspects including respondents, findings interpretation, and experimental design to provide higher-quality evidence for depression medication preference research.

Full Text

Preamble

A Systematic Review of Medication Preferences in Depressed Patients—Based on Discrete Choice Experiments and Best-Worst Scaling

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Abstract

Background: Antidepressants represent a primary treatment modality for depression, and incorporating patient preferences can effectively improve medication adherence. While several studies have explored medication choice preferences among depressed patients, no systematic synthesis of this literature has been conducted to date.

Objective: To systematically review studies applying discrete choice experiments (DCE) and best-worst scaling (BWS) to assess patient preferences for depression medication, providing reference for rational clinical prescribing and future preference research.

Methods: Using keywords including "DCE," "BWS," "depression," "discrete choice experiment," and "best-worst scaling," we systematically searched six databases (CNKI, Wanfang, VIP, PubMed, Web of Science, and Embase) for

studies published through December 31, 2021. We extracted data from included studies and assessed quality using the PREFS checklist. Attributes were categorized into outcome, process, and cost domains, and their relative importance was evaluated.

Results: Seven DCE studies were identified. Outcome attributes were most frequently included, followed by process and cost attributes. Synthesis of relative importance weights across the seven studies revealed that outcome attributes were most important, followed by cost and process attributes. Based on PREFS scores, one study received 4 points and six studies received 3 points. Most studies required improvement in reporting on respondents and findings.

Conclusion: Outcome attributes are most important to patients during medication use, such as remission rates and weight gain. Clinicians and policymakers should prioritize these factors and fully incorporate patient preferences when determining treatment plans. Current studies have room for improvement in dimensions such as sample difference reporting and experimental design, including reporting differences between responders and non-responders, describing whether excluded patients differed significantly from included patients, and selecting appropriate survey methods. Future research should enhance study design regarding respondents, findings, and experimental design to provide higher-quality evidence for depression medication preference studies.

Keywords: Depression; Patient Preferences; Medication; Discrete Choice Experiment; Best-Worst Scaling

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Introduction

According to WHO data, approximately 280 million people worldwide suffered from depression in 2019, imposing an increasingly severe disease burden, yet consultation rates and treatment adherence remain low. As a chronic mental disorder, patients may face prolonged medical decision-making. Research indicates that incorporating patient preferences into medical decision-making can enhance intervention effectiveness. The *Chinese Guidelines for the Prevention and Treatment of Depressive Disorders (Second Edition)* explicitly states that psychiatrists should recognize and understand patient preferences, establish patient-centered concepts and friendly doctor-patient relationships, and improve treatment adherence. Currently, pharmacotherapy is a primary treatment for depression. Commonly used antidepressants can be divided into 12 different categories with varying chemical structures and mechanisms of action, resulting in different efficacy, adverse effects, prices, and dosing frequencies that create distinct risk-benefit profiles for patients. Therefore, considering patient preferences is particularly important in medical decision-making for depression.

Discrete choice experiments (DCE) and best-worst scaling (BWS) are powerful tools for measuring patient preferences. In DCE, patients choose between two or

more alternatives described by different attribute levels. In BWS, respondents identify the best and worst items from repeatedly presented subsets. No previous study has systematically reviewed antidepressant medication preference research. Therefore, this study aims to systematically synthesize domestic and international studies using DCE and BWS to measure medication preferences in depressed patients, analyze factors influencing medication choice, and provide reference for developing interventions that promote patient involvement in clinical decision-making.

Methods

1.1 Literature Search

Using a combination of subject headings and free-text terms, we searched six Chinese and English databases (CNKI, VIP, Wanfang, PubMed, Web of Science, and Embase) from inception to December 31, 2021, supplemented by additional sources. English search terms included "discrete choice experiment,""DCE,""best-worst scaling," "BWS," "stated preference," "paired comparison," "depression," "depressive disorder," "major depressive disorder," "MDD," and "bipolar disorder." Chinese search terms included "离散选择实验," "优劣尺度法," "抑郁症," and related terms.

1.2 Inclusion and Exclusion Criteria

1.2.1 Inclusion Criteria: Studies with participants who were depressed patients about to, currently, or previously receiving pharmacotherapy or combination treatment; studies assessing medication choice preferences in depressed patients; studies using DCE or BWS methods; and studies published in Chinese or English.

1.2.2 Exclusion Criteria: Duplicate publications; reviews, conference abstracts, and case reports; studies without accessible full text; studies using other preference elicitation methods; studies not focusing on patient medication choice preferences; and studies not in Chinese or English.

1.3 Literature Screening

Two independent reviewers conducted article identification and screening. Titles and abstracts were first reviewed against predetermined criteria to exclude obviously irrelevant literature. Full texts were then reviewed for final inclusion. Discrepancies between reviewers were resolved through discussion with a third researcher.

1.4 Data Extraction and Analysis

Data extraction and analysis proceeded in three steps. First, Microsoft Excel 2020 was used to summarize study characteristics, including title, author, publication year, country, research objectives, study population, sample size, and depression type. Second, the PREFS quality assessment checklist was applied to score five domains: purpose, respondents, explanation, findings, and significance (1 point per domain, maximum 5 points). Third, attributes were categorized into outcome, process, and cost domains to assess importance. Outcome attributes referred to post-medication outcomes or states (e.g., efficacy, adverse effects); process attributes referred to treatment experiences (e.g., modality, frequency, location); and cost attributes related to medication expenses (e.g., monthly out-of-pocket costs).

Results

2.1 Literature Search Results

The search strategy identified 250 published articles. After removing 64 duplicates, 186 articles remained. Title and abstract screening excluded 166 irrelevant articles, yielding 20 articles for full-text review. After excluding 9 articles not focusing on depressed patient medication preferences, 2 abstracts/protocols, and 2 articles not using DCE/BWS methods, seven studies were finally included [Figure 1: see original paper].

2.2 Study Characteristics

Seven English-language studies published between 2007-2021 were included, all using conjoint analysis or DCE. No BWS studies were identified. All studies were published in medical journals: four from the United States, and one each from Germany, the Netherlands, and Australia. No DCE or BWS studies were found addressing medication preferences in Chinese depressed patients. Detailed characteristics are shown in Table 1 . As this review focused on medication choice preferences, treatment regimen details were not analyzed. Since no BWS studies were found in depression, only DCE results were analyzed.

2.3 Literature Quality Assessment

Table 2 presents PREFS quality assessment results. All studies clearly stated research questions and preference-related purposes. However, none reported differences between responders and non-responders. All studies clearly explained preference assessment methods. Only one study included data from all respondents; while others explained exclusion of respondents (e.g., failing quality checks, incomplete data), they did not describe whether excluded patients differed significantly from included patients. All studies used significance test-

ing to evaluate preference results. Six studies received 3 points, and one study received 4 points.

2.4 Attribute Identification and Questionnaire Development

All included studies reported attribute/level identification methods, which were consistent across studies. Five studies used literature review combined with qualitative research, while two used qualitative research alone. Expert interviews, patient interviews, and focus group discussions were the most common methods. One study conducted individual interviews (respondent status unclear), three conducted expert interviews, three conducted patient interviews, and three used focus groups.

Attribute/level numbers should be tailored to study context and population characteristics. Included studies set 4-9 attributes with 2-5 levels each, though one study included 8 levels for the cost attribute. All seven studies used online surveys; one supplemented this with face-to-face interviews for older and less adherent patients to reduce selection bias toward internet-accessible participants.

The seven studies included 47 total attributes: 41 outcome attributes, 5 process attributes, and 1 cost attribute. Adverse effects (n=23) and efficacy (n=16) were the most frequently included outcome attributes. Weight gain was the most commonly included adverse effect (n=3), followed by fatigue (n=2). Time to treatment response was the most frequently included efficacy attribute (n=3). Visit frequency was the most common process attribute (n=2). Two studies combined outcome and process attributes, four included only outcome attributes, and one included all three attribute categories . All attributes except two outcome attributes (one adverse effect and one efficacy) and one process attribute showed statistically significant preference results.

2.5.2 Relative Importance of Attributes

All seven studies reported relative preference coefficients. Table 3 summarizes relative importance scores across studies. Figure 2 [Figure 2: see original paper] shows the frequency with which attributes were rated most important. One study' s medication preference analysis yielded three separate results by administration route, producing nine total "most important" attributes. Outcome attributes were rated most important 8 times, cost attributes once. Within outcome attributes, adverse effects were rated most important 6 times, efficacy 2 times.

Discussion

This systematic review identified seven DCE studies on depression medication preferences across various depressive disorders, all surveying adult patients taking antidepressants. Outcome attributes were most frequently included and

most important to patients, particularly adverse effects and efficacy, likely reflecting medication characteristics. Relative importance results showed outcome attributes ranked highest, with adverse effects and efficacy being key factors influencing preferences. In some studies, adverse effects outweighed efficacy, suggesting patients may sacrifice some therapeutic benefit to reduce adverse effect incidence. Notably, certain attributes may have strong influence: Ng-Mak' s study found weight gain had a preference weight of 49.6%, indicating it may be a critical factor in medication choice for that sample, suggesting personalized regimens with lower weight gain risk could improve adherence. However, another study found weight gain less important than gastrointestinal adverse effects, though the difference was small (0.6%), highlighting how attribute importance varies by included attributes and sample characteristics.

Process attributes appeared less important to medicated patients, though research indicates they are most important for patients without established treatment plans, with treatment modality sometimes outweighing efficacy for some patients. This suggests different considerations for patients at different treatment stages. Previous studies also show patients value cost attributes highly in both medication and treatment selection, likely due to long treatment duration and high out-of-pocket expenses. However, only one included study incorporated cost attributes, requiring more evidence to confirm its importance.

Overall, DCE applications in depression medication preferences are relatively well-reported but have room for improvement. Most studies scored 3 on PREFS, with only one scoring 4. None reported differences between responders and non-responders, potentially introducing non-response bias. Regarding findings, most studies explained why respondent data were excluded (e.g., failed quality checks, incomplete surveys) but did not address how this exclusion affected results. Some attribute/level settings were broad (e.g., Wittink et al. defined side effect type with levels of nausea, dizziness, and sexual dysfunction), yielding coarse preference results that complicate cross-study comparisons.

Although studies scored well on purpose, explanation, and significance, the PREFS checklist may inadequately assess internal quality, omitting important DCE standards. Therefore, we referenced the ISPOR 10-item checklist for further evaluation, identifying several issues.

First, appropriate attribute/level identification is the first and most critical step in DCE research. While most studies combined multiple methods, some may have neglected literature review or consultation with patients/clinicians. Systematic literature review is an important source for initial attributes/levels, and different stakeholder groups may have different perspectives on attribute inclusion. Omitting any group may lead to inappropriate or missing attributes/levels, biasing results. Second, attribute/level number settings require attention. Most DCE studies include 4-9 attributes with no more than 4 levels. While most studies appropriately controlled these numbers, some set too many levels, potentially burdening patients and affecting attribute trade-offs. Finally, survey methodology is important. Most included studies used online self-administered

surveys, while ISPOR guidelines recommend interviewer-administered surveys, as interviewers may better understand DCE design and questions, yielding more reliable data.

No BWS studies in depression were identified. As an emerging preference research method, BWS offers unique advantages: BWS-1 can include more attributes (10+) to explore preferences, imposes less burden on vulnerable populations (elderly, children, cognitively impaired), and has many direct applications in healthcare (medical decision-making, priority-setting). Future research should explore BWS applications in depression preference studies.

Conclusion

This systematic review synthesized DCE and BWS studies on depression medication preferences and analyzed patient preference results. Outcome attributes were most frequently included and most important to patients. Cost attributes were least frequently included but also important. Process attribute preferences showed significant individual variation—for example, they were most important for patients without established treatment plans. Healthcare decision-makers should recognize different preferences across treatment stages, integrate various evidence sources, incorporate patient preferences into medical decisions, improve adherence, and enhance care quality. PREFS and ISPOR criteria indicate most reports are relatively complete but need improvement in reporting differences between responders and non-responders, included versus excluded samples, attribute/level identification and setting, and survey method selection. Future research should address these dimensions to provide higher-quality empirical evidence for depression preference studies.

Author Contributions: Ren Yanfeng led study design, literature screening, and manuscript writing; Liu Shimeng contributed to study design and manuscript revision; Tao Ying conducted literature screening and quality assessment; Chen Yingyao supervised manuscript writing, quality control, and final approval. All authors approved the final manuscript.

Conflict of Interest: All authors declare no conflicts of interest.

References

1. Institute of Health Metrics and Evaluation. Global Burden of Disease Study 2019. https://ghdx.healthdata.org/gbd-results-tool?params=gbd-api-2019-permalink/d780dffbe8a381b25e1416884959e88b

2. Bien DR, Danner M, Vennedey V, Civello D, Evers SM, Hiligsmann M. Patients' Preferences for Outcome, Process and Cost Attributes in Cancer Treatment: A Systematic Review of Discrete Choice Experiments.

Patient-Patient Centered Outcomes Research. Oct 2017;10(5):553-565. doi:10.1007/s40271-017-0235-y

3. Flynn TN, Louviere JJ, Peters TJ, Coast J. Best–worst scaling: What it can do for health care research and how to do it. J Health Econ. Jan 2007;26(1):171-89. doi:10.1016/j.jhealeco.2006.04.002

4. Ali S, Ronaldson S. Ordinal preference elicitation methods in health economics and health services research: using discrete choice experiments and ranking methods. Br Med Bull. Sep 2012;103(1):21-44. doi:10.1093/bmb/lds020

5. de Bekker-Grob EW, Ryan M, Gerard K. Discrete choice experiments in health economics: a review of the literature. Health Econ. Feb 2012;21(2):145-72. doi:10.1002/hec.1697

6. Zhang L, Huang J, Wang H, Jiang S. Review of Best-Worst Scaling Theory and Application. Statistical Information Forum. 2019;34(03):24-30.

7. Johnson FR, Ozdemir S, Manjunath R, Hauber AB, Burch SP, Thompson TR. Factors that affect adherence to bipolar disorder treatments: A stated-preference approach. Medical Care. June 2007;45(6):545-552. doi:10.1097/MLR.0b013e318040ad90

8. Wittink MN, Cary M, TenHave T, Baron J, Gallo JJ. Towards patient-centered care for depression: Conjoint methods to tailor treatment based on preferences. Patient. 2010;3(3):145-157. doi:10.2165/11530660

9. Zimmermann TM, Clouth J, Elosge M, et al. Patient preferences for outcomes of depression treatment in Germany: A choice-based conjoint analysis study. Journal of Affective Disorders. Jun 2013;148(2-3):210-219. doi:10.1016/j.jad.2012.11.062

10. Wouters H, Van Dijk L, Van Geffen EC, Gardarsdottir H, Stiggelbout AM, Bouvy ML. Primary-care patients' trade-off preferences with regard to antidepressants. Psychol Med. Aug 2014;44(11):2301-8. doi:10.1017/s0033291713003103

11. Ng-Mak D, Poon JL, Roberts L, Kleinman L, Revicki DA, Rajagopalan K. Patient preferences for important attributes of bipolar depression treatments: A discrete choice experiment. Patient Preference and Adherence. 2018;12:35-44. doi:10.2147/PPA.S151561

12. Fairchild AO, Katz EG, Reed SD, et al. Patient preferences for ketamine-based antidepressant treatments in treatment-resistant depression: Results from a clinical trial and panel. Neurology Psychiatry and Brain Research. September 2020;37:67-78. doi:10.1016/j.npbr.2020.05.003

13. Fifer S, Puig A, Sequeira V, et al. Understanding treatment preferences of australian patients living with treatment-resistant depression. Patient Preference and Adherence. 2021;15:1621-1637. doi:10.2147/PPA.S311699

14. Tunnessen M, Hiligsmann M, Stock S, Vennedey V. Patients' preferences for the treatment of anxiety and depressive disorders: a systematic review of discrete choice experiments. J Med Econ. Jun 2020;23(6):546-556. doi:10.1080/13696998.2020.1725022

15. Joy SM, Little E, Maruthur NM, Purnell TS, Bridges JFP. Patient Preferences for the Treatment of Type 2 Diabetes: A Scoping Review. Pharmacoeconomics. Oct 2013;31(10):877-892. doi:10.1007/s40273-013-0089-7

16. Bridges JFP, Hauber AB, Marshall D, et al. Conjoint Analysis Applications in Health-a Checklist: A Report of the ISPOR Good Research Practices for Conjoint Analysis Task Force. Value Health. Jun 2011;14(4):403-413. doi:10.1016/j.jval.2010.11.013

17. Liu S, Li S, Yang Y, Tang C, Chen Y. Literature Analysis of Discrete Choice Experiments Applied to Treatment Preferences of Type 2 Diabetes Patients. Chinese Pharmacy. 2020;31(20):2524-2531. doi:10.6039/j.issn.1001-0408.2020.20.17

18. Soekhai V, de Bekker-Grob EW, Ellis AR, Vass CM. Discrete Choice Experiments in Health Economics: Past, Present and Future. Pharmacoeconomics. Feb 2019;37(2):201-226. doi:10.1007/s40273-018-0734-2

19. Marshall D, Bridges JF, Hauber B, et al. Conjoint Analysis Applications in Health - How are Studies being Designed and Reported?: An Update on Current Practice in the Published Literature between 2005 and 2008. Patient. Dec 1 2010;3(4):249-56. doi:10.2165/11539650-000000000-00000

Note: Figure translations are in progress. See original paper for figures.