Research Open

Endocrinology, Diabetes and Metabolism Journal

Volume 9 Issue 1

Research Article

A Qualitative Study of Factors Influencing Medication Adherence to Anticoagulants in Patients with Atrial Fibrillation from a Behavioral Economics Perspective

Yaqian Chen[1], Xiangxu Meng[1], Yaping Feng[2] and Xingwei Zhang[2]*

[1]School of Nursing, Hangzhou Normal University, Zhejiang Province, China

[2]The Affiliated Hospital of Hangzhou Normal University, Zhejiang Province, China

***Corresponding author:** Xingwei Zhang, The Affiliated Hospital of Hangzhou Normal University, Zhejiang Province, China

Received: March 05, 2025; **Accepted:** March 08, 2025; **Published:** March 09, 2025

Abstract

Objective: To explore the adherence influencing factors of anticoagulant medication adherence in patients with atrial fibrillation under the perspective of behavioral economics, and to provide a reference basis for constructing an anticoagulant medication adherence improvement program for patients with atrial fibrillation.

Methods: A descriptive qualitative study was designed, semi-structured interviews were conducted with 13 patients with atrial fibrillation, and thematic analysis was used to analyze the data and refine the themes.

Results: The factors influencing medication adherence to anticoagulants in patients with atrial fibrillation can be categorized into five themes: representative bias, psychological accounts, social norms, time inconsistency preference, and optimism bias.

Conclusion: Anticoagulant medication adherence in patients with atrial fibrillation is affected by a variety of factors, and behavioral economics can be applied to the study of management strategies for patients with chronic diseases, such as atrial fibrillation, and intervention strategies can be proposed from the perspective of psychology to improve patients' adherence to medication.

Keywords: *Atrial fibrillation, Anticoagulants, Adherence, Behavioral economics, Qualitative research*

Atrial Fibrillation (AF) is one of the most common arrhythmias in clinical practice. According to the results of the seventh national census published by the National Bureau of Statistics of China [1], there are at least 6.9 million AF patients in China, and the number and prevalence of AF is expected to increase even more significantly in the future as the life expectancy of human beings increases. Stroke is the most common and serious complication of AF, and studies have shown [2], that 20% to 30% of ischemic strokes are caused by AF, and patients with ischemic stroke caused by AF have a higher rate of death and disability than non-AF patients, and require 0.5 times higher medical costs.

Oral anticoagulant therapy is the treatment of choice for stroke prevention in atrial fibrillation recommended by today's national and international guidelines. In addition to reducing stroke risk and stroke severity in patients with AF, oral anticoagulant therapy also reduces the risk of AF-associated dementia [3], Oral anticoagulant therapy is the treatment of choice for stroke prevention in atrial fibrillation recommended by today's national and international guidelines. In addition to reducing stroke risk and stroke severity in patients with AF, oral anticoagulant therapy also reduces the risk of AF-associated dementia [4], and adherence decreases with increasing age. Therefore, it is crucial to understand the factors influencing adherence to anticoagulant medication in patients with atrial fibrillation.

Behavioral economics is a combination of economics, psychology, sociology and other disciplines developed a cross-disciplinary, used to describe the decision-making behavior of individuals [5], in the study of human decision-making behavior, behavioral economics focus is not on the correctness or incorrectness of the decision itself, but rather to make a decision on the individual's cognitive and psychological activity behavior. Behavioral economics theory uses cognitive mode and reflective mode preferences to help individuals make rational choices [6], showing more advantages in intervening in people's decision-making behavior, which is not easy to cause individuals to resist the psychology, and the cost is low, which can promote individuals to make better decisions.

Therefore, this study introduces the behavioral economics perspective into the study of factors influencing treatment adherence in patients with atrial fibrillation, and adopts a qualitative research approach, aiming at obtaining more comprehensive factors influencing adherence in patients with atrial fibrillation, with a view to providing references and lessons for scholars in China to develop strategies for the management of adherence to anticoagulant drugs in patients with atrial fibrillation.

Objects and Methods

Objects

Purposive sampling method was used to select patients with atrial fibrillation who met the criteria for natriuresis from February to August 2024 in a tertiary hospital in Hangzhou City as the interview subjects. The study was reviewed by the Ethics Committee. Inclusion criteria: (1) Age >18 years old. With good language skills; (2) taking oral anticoagulants for >6 months; (3) voluntary participation in this study. Exclusion criteria: (1) presence of mental illness, hearing impairment, or intellectual disability; (2) inability to accept audio recording during the interview; (3) serious physical condition that prevented cooperation with the interviewer. Sampling was carried out following the principle of maximizing differences, and the sample size was used until the information was saturated. Thirteen interview subjects were finally included, 8 male and 5 female; ages 38 to 80 (57.38±10.744); 6 patients with junior high school or lower education and literacy, 4 high school, 2 secondary school or college, and 1 university; 9 patients currently residing in the city and 4 currently residing in the countryside; 4 patients living alone, 9 patients not living alone; 8 patients using urban and rural residents' health insurance, and 5 used employee health insurance; 5 patients were on warfarin and 8 patients were on new oral anticoagulants; years of illness ranged from 1 to 10 years (5.15±2.672); 4 patients had a number of combined other diseases ≤1, 4 patients had a combination of 2 other diseases, and 3 patients had a combination of 3 or more other diseases.

Methods

Preparation of Interview Outlines

According to the research purpose, theory, and related literature research content of this study, the preliminary outline of the interview was drawn up after consulting the experts, and the outline was revised according to the preliminary literature research and the results of the pre-interviews of the two cases, and the outline of the interview was finally determined: (1) How has long-term use of anticoagulant medication brought about an impact on your life? (2) What are the current therapeutic drugs? (3) What factors do you focus on during the medication process? (What factors would make you feel that the drug is working) (4) Have you ever missed or stopped taking your medication on your own, and what was the reason? What did you do when you realized that you missed a dose? (5) Do you have any concerns when taking anticoagulants? (6) What difficulties have you encountered in the use of your medication? Who would you like to bring in to support you in these difficulties? (7) What are some of the factors that prevent you from adhering to your medication? (8) What do you think would help you to be more adherent to your anticoagulant medication? (Family members/healthcare professionals/patients/society) (9) Do you usually know something about medication? Which aspects of knowledge do you pay more attention to? In what way do you usually learn about the disease?

Methods of Data Collection

The researcher conducted the qualitative interviews by contacting suitable interviewees in advance and booking the time and place for the interviews. Face-to-face semi-structured interviews were used, each interview lasted 30-45 minutes, and the whole interview process was audio-recorded. The interviews were conducted by the same researcher who had systematically studied qualitative research, and the researcher communicated with the interviewees in the form of questioning and answering according to the interview outlines, and adjusted the order of the outlines and asked follow-up questions according to the interviewees' answers, in order to collect as much information as possible in the interviews.

Methods of Data Analysis

The qualitative interview data were transcribed verbatim within 24 hours of the end of the interview, and the audio recordings were listened to repeatedly to ensure the accuracy of the transcription and to supplement the interviewee's tone of voice, etc., in conjunction with the interview transcripts. The transcribed text was then imported into Nvivo 12.0 software for management, coding, and analysis. Both transcription and analysis of the data were carried out independently by two researchers, and when disagreements existed, they were discussed and a third researcher was asked to reach a consensus. Thematic analysis was used to analyze the interview data, and data collection was synchronized with data analysis.

Findings

By analyzing and distilling the interview data of 13 patients with atrial fibrillation who were undergoing oral anticoagulant therapy, the influences on adherence to anticoagulant therapy in patients with atrial fibrillation were finally summarized into five themes.

Theme 1: Influenced by Representativeness Bias

Due to insufficient knowledge of AF and anticoagulants, patients are easily influenced by the experiences or descriptions of people around them and use the situation of a small sample to infer the situation of a large sample, thus ignoring the a priori probability, leading to poor decision-making and discontinuing medication on their own. Some patients with weak awareness of medication safety will choose whether to take medication based on their own experience, and some subjects found that a small number of people around them taking anticoagulants still experienced vascular adverse events, then they will ignore the a priori probability, and will question the efficacy and safety of anticoagulant drugs a priori: N4: "Isn't there still a person who has taken the medication or had a cerebral infarction, a lot of, nothing to do with this medication. " There were also subjects who believed that if other patients did not take anticoagulants without vascular adverse events, then they themselves could not adhere to the medication: N13: "There is a person in our village who also has a bad heart, for many years, did not take the medication, and now he has not had an attack."

Complex Knowledge of Atrial Fibrillation and Anticoagulants

The reason for patients' representative cognitive bias is partly because the knowledge related to atrial fibrillation and anticoagulants is too complex, and there are many drugs and foods that tend to react with anticoagulants, and it is difficult for patients who lack a professional medical background to fully grasp them, N1: "Atrial

fibrillation those are professional knowledge, doctors they only know, and I haven't read much, so how can I remember it. " N6: "The doctor also talked to me about it, the usefulness of this medicine and so on, but after two days I forget."

Lack of Access to Specialized Knowledge

Secondly, it is because patients lack channels to obtain specialized information. Some patients lack the subjective initiative to obtain disease-related knowledge, the doctor is the only way for most patients to obtain professional knowledge, N3: "The doctor told me how to eat how I eat, I do not understand." "The doctor said is not very detailed, side effects and so on I do not quite understand, Baidu asked to see you do not dare to believe." N8: "Still trust the doctor a little more, that is to say that the knowledge of the Internet may not be accurate."

When the doctor failed to meet the needs of patients to obtain knowledge related to medication, some patients in order to obtain professional advice will choose to go online to seek help, however, the medical information on the network is difficult to distinguish between true and false, mixed, when the patient is difficult to identify the correct information, it will be blindly seeking medical treatment, N10: "I saw on TV, the kind of health program sold, said that the cardiovascular benefits, I would like to buy to try. I just want to buy it and try it."

Theme 2: Influenced by Psychological Accounts

Patients will pre-divide the expenditure of the funds they have into several categories such as travel, medical care, daily expenses, etc. When the actual expenditure of patients for the treatment of atrial fibrillation exceeds their own psychological budget, there is a probability that they will choose to be non-compliant. Most atrial fibrillation patients are middle-aged or elderly and suffer from multiple chronic diseases, requiring long-term use of three or more medications. With the progression of the disease, the economic burden brought by long-term medication gradually increases, leading to negative emotions towards medication, thus affecting patients' compliance with medication. n2: "If I take one box of dabigatran a day, I'll take that imported box of 160, and that's 6 boxes a month, and that's a thousand boxes. If I take one box of Dabigatran a day, and I take that imported box of more than 160, that's 6 boxes a month, that's a thousand dollars."

However, some patients still insist on taking medication even when their medical expenses exceed their psychological accounts, probably because medical expenses are different from daily expenses and are related to the safety of patients' lives, so even if they spend more money, some patients still insist on taking treatment. N8: "The medication is definitely a little bit expensive, and there's no way to cure the disease, the doctor said to keep taking it. "

Theme 3: Influenced by Social Norms

Social norms are a standard of behavior for social members in a social group, which can constrain and guide individual behavior by influencing the decision-making behavior of social members [7]. The influence of social norms on the medication-taking behavior of patients with atrial fibrillation (AF) depends on the ability to be aware of other patients with AF taking their medication, understanding what to do as a patient with AF, and the perception of other people if they do not take their medication on time.

When patients with atrial fibrillation perceive social norms, i.e., realize that other patients with atrial fibrillation take their anticoagulant medications consistently and have a good prognosis, they realize the importance of adhering to their medications and the consequences of not adhering to their medications. However, most of the patients in this study did not take the initiative to communicate with other patients about their condition and did not know about the treatment of other patients. N10: "I usually don't know much about the treatment of other patients and I don't communicate with others about their condition." N11: "What kind of medicines other people take, how many boxes a month, this kind of thing is after all other people's privacy, and I don't feel too good to ask."

Some patients recognize that not taking medication as prescribed will bring greater financial and living burdens to their families, and out of a sense of responsibility to their family members, this group of patients has a high level of compliance, N12: "If I don't stick to the medication, I'll spend more money if I'm re-hospitalized, and my family will have to take time off from work to come to stay with me in bed." However, there are also some patients who are not able to realize what patients with atrial fibrillation should do to comply with the doctor's instructions, and increase or decrease their medication on their own according to their own experience, N5: "It feels that atrial fibrillation is not as serious as other heart diseases, and that I have to have an operation or something." N2: "Originally the amount of two tablets at a time, I changed it to one tablet at a time by myself, sometimes a bit of chest tightness other than that there is no discomfort."

Theme 4: Influenced by Inconsistent Time Preferences

Atrial fibrillation has a long course and develops slowly, and anticoagulation management requires long-term medication and adherence to healthy lifestyle habits, which costs a lot of time and money; however, anticoagulant medications are slow to work, and the benefits of adherence to medication are not immediately perceived, and patients have a poor sense of benefit from treatment in the moment, N9: "I took antihypertensive medication in the morning, and my BP came down that day, and I took rivaroxaban for a while It didn't feel like it was helping." In this case, patients with AF are faced with the intertemporal decision between investing large amounts of healthcare resources in the long term to improve cardiovascular status in the future, or investing a small amount of healthcare resources in the short term in exchange for a short-term reduction in overall healthcare expenditures and a reduction in the burden on the family, which, when encountered by patients with intertemporal decision-making, is influenced by the preference for temporal incoherence and can result in a tendency to choose the immediate reward of the undesirable behavior. choose the immediate rewards from bad behaviors and ignore the long-term benefits from healthy behaviors. N5: "Just then the frequency of checkups was very high, once a month, but now it may be slightly less, a few times a year, maybe because it was not very convenient during that time of the epidemic, and I just think that once a month is a bit of a hassle as well." N6: "To check the

hospital you have to go in and get blood drawn, you have to queue up, and then you have to wait for the results or something, half a day is gone, and my son has to go to work and doesn't have that much time."

Theme 5: Influenced by Optimism Bias

Even when recognizing that poor behavioral habits can affect their health, some patients remain optimistic that their risk of being harmed by such behaviors is lower than that of other patients, N3: "I didn't even take any medication for my previous new crown, I made it through on my own, I'm in good shape with my resistance." N7: "I'll be fine with one or two less meals, I'm in good shape." The reason for this is the influence of the optimism bias that one is less likely to have an obstructive vascular event than others [8].

Discussion

Enhancing Patient Health Education to Change Medication Beliefs and Perceptions

This study found that some patients with atrial fibrillation are affected by their own cultural limitations, health education is not in place and other factors, most patients do not have enough knowledge about atrial fibrillation and anticoagulant drugs, which leads to some patients questioning the efficacy and safety of anticoagulant drugs, resulting in some patients stopping their medication by themselves or increasing or decreasing the medication by themselves. Some studies have shown [9] that only when patients have a certain understanding of the drug, they can have positive beliefs about taking the drug, which will lead to the improvement of adherence. Behavioral economics theory suggests that human rationality is limited, and limited attention and memory are not enough to remember and process all the health information. Therefore, when conducting health education, the actual situation of patients' literacy level and age should be considered, and the content of the education needs to be simple, direct, and relevant, in order to make the patients remember the information at the critical moment of decision-making. Some scholars have utilized vivid drawings and short words instead of complex medical knowledge to educate elderly patients with atrial fibrillation about anticoagulants, which effectively improved the anticoagulation compliance and self-management ability of elderly patients with atrial fibrillation [6] Tutorials such as brochures, educational videos, websites, software, lectures, and WeChat have also been proven to be an effective form of improving patients' cognitive level, which suggests that clinical workers should combine diversified tutorials according to patients' characteristics to improve the efficiency of the tutorials, improve the correct knowledge of anticoagulant drugs in patients with atrial fibrillation, reduce the uncertainty of the disease in patients with atrial fibrillation, and avoid representative cognitive bias and optimistic bias in the patients

Promoting Socially Normative Behaviors to Change the Decision-making Environment

Behavioral economics theory suggests that individuals are influenced by the social environment in which they live and that their decision-making behavior is not only motivated by self-interest, but is also driven by group perceptions, whereby if other people act in accordance with a certain socially accepted behavioral norm, then that person is perceived as behaving appropriately, and conversely if they don't, then they are disapproved [10]. However the extent to which an individual is influenced by social norms depends on the degree of interaction between the individual and the social environment. Social norms have been used by foreign scholars on studies of health promoting behaviors and have been remarkably successful [11]. In a study at the University of California, San Francisco, adolescents' attitudes toward type 2 diabetes were effectively changed by establishing an online platform to promote mutual communication among adolescents, and organizing seminars and distributing public service advertisements to promote the dissemination of healthy behaviors, which showed that most of the adolescents were willing to change their poor living and dietary habits for the purpose of preventing diabetes due to the influence of their social environmen. This suggests that we can use the Internet and social media to promote and disseminate knowledge about atrial fibrillation and anticoagulant drugs, improve patient acceptance of anticoagulant drugs, and make standardized medication regimen a widely accepted social normative behavior for patients with atrial fibrillation; at the same time, the formation of a patient group of patients with atrial fibrillation, encouraging patients to communicate with each other, and inspiring patients to maintain a positive image of adherence to medication.

Fixing Current Preferences and Providing Extrinsic Motivation

Behavioral economics also refers to human time-inconsistent preferences as self-control problems, procrastination problems, problems with the short-term self and the long-term self, and when patients with atrial fibrillation have time-inconsistent preferences, they fail to adhere to their medication due to self-control problems, even if their knowledge of anticoagulant medication is correct [13]. Incentive strategy is the most widely used intervention strategy in studies on behavioral economics [14] for example, scholar Sebastian Linnemayr [15] used a small raffle incentive to intervene with young Ugandan AIDS patients, where weekly text messages would be sent to remind participants that antiretroviral therapy (ART) monitoring compliance would be eligible to participate in a raffle, and eventually ART adherence improved significantly; Barbara Riegel [16] used a telemedicine intervention, where patients were reminded to take their medication at a specified time every day via a smart device, and the medication record was monitored using an electronic bottle cap, and after 90 days of intervention, medication adherence improved significantly, and the rate of re-hospitalization was reduced significantly. This suggests that clinicians can improve anticoagulant medication adherence by motivating patients with atrial fibrillation to adopt healthy behaviors immediately through immediate rewards or regular feedback, and by translating long-term goals into multiple short-term goals, thereby overcoming individual time-inconsistent preferences.

Summary

This study started from the perspective of behavioral economics theory to explore the influencing factors of anticoagulant medication adherence in patients with atrial fibrillation, and ultimately refined

the five themes of influencing factors, which suggests that clinical workers should pay attention to influencing the adherence to anticoagulant medication in patients with atrial fibrillation from multiple perspectives. In future research, behavioral economics can be applied to the study of management strategies for patients with chronic diseases such as atrial fibrillation, and intervention strategies can be proposed from the perspective of psychology to improve the subjective initiative of patients, as well as to improve the efficiency of long-term management of chronic diseases.

References

1. Song J. The Chinese burden of atrial fibrillation review of atrial fibrillation studies in China[J/OL]. *Ann Noninvasive Electrocardiol* 2022. [crossref]
2. Zoni-Berisso M, Lercari F, Carazza T, et al. Epidemiology of atrial fibrillation: European perspective[J/OL]. *Clin Epidemiol* 2014. [crossref]
3. Kim D, Yang P S, Yu H T, et al. Risk of dementia in stroke-free patients diagnosed with atrial fibrillation: data from a population-based cohort[J/OL]. *Eur Heart J* 2019. [crossref]
4. Perreault S, De Denus S, White-Guay B, et al. Oral anticoagulant prescription trends, profile use, and determinants of adherence in patients with atrial fibrillation[J/OL]. *Pharmacotherapy* 2020. [crossref]
5. Tversky A, Kahneman D .The framing of decisions and the psychology of choice[J/OL]. *Science* 1981. [crossref]
6. Wang Qing, Wei Wenting, Zhang Meng, et al. Study on compliance behavior boosting strategy of anticoagulant therapy in elderly patients with atrial fibrillation[J]. *Medical Innovation of China* 2023.
7. Cislaghi B, Heise L. Using social norms theory for health promotion in low-income countries[J]. *Health Promot Int* 2019. [crossref]
8. Suh K H. Verification of a theory of planned behavior model of medication adherence in Korean adults: focused on moderating effects of optimistic or present bias[J/OL]. *BMC Public Health* 2021. [crossref]
9. Xie Chuantao, Gu Yanhong, Li Yumei, et al. Influencing factors of medication adherence among older patients with chronic heart failure: an analysis based on COM-B model[J]. *Chinese Nursing Research* 2024
10. Alm J, Bourdeaux C J. Applying behavioral economics to the public sector[J/OL]. *Hacienda Publica Esp* 2013
11. Miller D T, Prentice D A. Changing norms to change behavior[J/OL]. *Annu Rev Clin Psycho* 2016. [crossref]
12. Rogers E A, Fine S, Handley M A, et al. Development and early implementation of the bigger picture, a youth-targeted public health literacy campaign to prevent type 2 diabetes[J/OL]. *J Health Commun* 2014. [crossref]
13. Hunter R F, Tang J, Hutchinson G, et al. Association between time preference, present-bias and physical activity: implications for designing behavior change interventions[J/OL]. *BMC Public Health* 2018. [crossref]
14. Patton S R. Applying behavioral economics theories to interventions for persons with diabetes[J]. *Curr Diabetes Rep* 2022. [crossref]
15. Linnemayr S, Huang H C, Wagner Z, et al. Goals for adherence with low-cost incentives (goals): a protocol for a randomized controlled trial evaluating the impact of small airtime incentives on art adherence among young people living with hiv in kampala, Uganda[J/OL]. *Trials* 2023. [crossref]
16. Riegel B, Stephens-Shields A, Jaskowiak-Barr A, et al. A behavioral economics-based telehealth intervention to improve aspirin adherence following hospitalization for acute coronary syndrome[J/OL]. *Pharmacoepidem Dr S* 2020. [crossref]

Citation:

Chen Y, Meng X, Feng Y, Zhang X (2025) A Qualitative Study of Factors Influencing Medication Adherence to Anticoagulants in Patients with Atrial Fibrillation from a Behavioral Economics Perspective. *Endocrinol Diabetes Metab J* Volume 9(1): 1-5.