

BMJ Open Influencing factors of health promotion behaviour in patients with aortic dissection: a qualitative study using the COM-B model

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ABSTRACT

Objectives This study aimed to understand influencing factors of health promotion behaviour in patients with aortic dissection (AD) using the capability, opportunity, motivation, behaviour (COM-B) model of behaviour.

Design A descriptive qualitative design was adopted. Data were collected using face-to-face semi-structured interviews and analysed using directed content analysis.

Setting Fujian Medical University Union Hospital.

Participants A purposive sample of 16 patients with AD.

Results The following themes and subthemes were identified. Psychological capability: (1) lack of disease knowledge; physical capability: (1) physical function limitation; (2) fatigue; physical opportunity: (1) limited access to disease knowledge; (2) communication between providers and patients; (3) objective condition restriction; social opportunity: (1) stigma; (2) social support; reflective motivation: (1) self-efficacy; (2) perceived benefits; (3) personal and family responsibilities; automatic motivation: (1) post-traumatic growth; (2) fear of disease progression.

Conclusion This study adopted a novel approach to understanding factors affecting health promotion behaviour among patients with AD. Interventions can be implemented using the Behaviour Change Wheel framework and study findings to improve health promotion behaviour in this patient population.

INTRODUCTION

Aortic dissection (AD) is an infrequent yet severe cardiovascular condition caused by a tear in the inner layer of the aorta.¹ According to the Stanford classification system, AD can be categorised into Stanford type A (involving the ascending aorta) and type B (not involving the ascending aorta). The incidence of AD in China is 2.78/100,000.²

In recent years, with the advancement of diagnostic and treatment techniques, the survival rate of AD has steadily improved.³ However, AD survivors still face many challenges, such as postoperative complications, impaired physical function, reduced quality of life, and psychological trauma.^{4–7}

STRENGTHS AND LIMITATIONS OF THIS STUDY

- ⇒ This study used the capability, opportunity, motivation, behaviour (COM-B) model for analysis of the factors influencing health promotion behaviour in people with aortic dissection.
- ⇒ This study employed maximum variation sampling to recruit patients with diverse demographic and disease characteristics, allowing a wider range of perspectives to be included in the analysis.
- ⇒ This study relied on patients' self-reported data, which may be influenced by memory bias and social desirability bias.

Health promotion behaviour refers to a series of behavioural activities undertaken by individuals to achieve the best health state and realise self-worth. Studies have shown that effective health promotion behaviour interventions can improve cardiac function in people with cardiovascular disease, enhance their quality of life, and reduce the risk of disease recurrence.^{8–9} Health promotion behaviours that have been recommended for patients with AD include dietary control, physical activity, cessation of smoking, medication adherence, and adherence to medical recommendations (such as monitoring blood pressure and body weight daily).¹⁰ However, despite the clear importance of health behaviour following an AD, patients' adherence to these medical recommendations remains suboptimal.^{5–11}

Identifying the determinants of health promotion behaviour in patients with AD, especially modifiable and intervenable factors, is critical to inform the development of evidence-based interventions. However, there are few studies on the influencing factors of health promotion behaviour in patients with AD. Research suggests the use of theoretical frameworks can be most effective when understanding behaviour, with

the ability, opportunity, motivation, behaviour model (COM-B model) being a recommended approach.¹² The advantage of the COM-B model is that it provides a novel and comprehensive approach to explain the barriers and facilitating factors of behaviour change, and gives a basis for the design of behavioural interventions. Therefore, the COM-B model has been applied to many clinical problems,^{13–15} but has not yet been applied to the health promotion behaviour of patients with AD. The aim of this study was to use the COM-B model to describe influencing factors of health promotion behaviour from the perspective of patient with AD.

METHODS

Patient and public involvement

None

Design

A qualitative descriptive study was conducted using semi-structured interviews.¹⁶ This study was reported according to the consolidated criteria for reporting qualitative research guidance.¹⁷

Setting

This study took place at Fujian Medical University Union Hospital, which is one of the largest comprehensive tertiary hospitals in Fujian Province, located in southeast China. The hospital has been designated as a National Regional Medical Centre for Cardiovascular Diseases. The Department of Cardiac Surgery performs more than 3000 cardiac surgeries annually, covering patients with a variety of cardiovascular diseases such as heart transplantation, aortic dissection, heart failure, heart valve disease, coronary artery disease, and congenital heart defects.

Sampling and recruitment

Case study sampling with maximum variation was employed to select potential participants from outpatients and wards of the Department of Cardiac Surgery at Fujian Medical University Union Hospital between October 2022 and February 2023. Eligible participants were contacted individually and informed about the study on-site by attending physicians and researchers. Inclusion criteria for this study were as follows: a diagnosis of Stanford type A or type B AD (type A was defined as any non-traumatic dissection involving the ascending aorta, and type B was defined as any non-traumatic dissection involving), age over 18, and a minimum disease duration of 3 months. Patients with severe mental illness or cognitive impairment were excluded. The sample size was determined based on the achievement of theme saturation. A total of 16 patients were interviewed for the study and assigned identification numbers 1–16 to maintain confidentiality. This study received review and approval from the Ethics Committee of Fujian Medical University Union Hospital (2022KY189).

Data collection

Individual semi-structured face-to-face interviews were adopted for data collection. The interview guide (online supplemental file 1) was based on literature, group discussions, and a preliminary pilot study with two patients. The interviews were conducted in an independent and private room to address the participants' privacy concerns. Prior to the interview, participants were provided with a clear explanation of the study's objectives. Written informed consent was obtained from voluntary participants, and socio-demographic data were collected. Interviews were conducted in Mandarin Chinese by JG and QP (Master's degree). Both are clinical fellows with qualitative research training. The interviewers had no prior involvement in the patients' care before the study. No one was present except the participants and researchers. The interviews lasted for 30–60 min and were audio-recorded. The research team took field notes during data collection. After the interviews, the participants had the opportunity to check the transcripts, and unclear answers were clarified in a second interview. There were no repeated interviews for this study.

Data analysis

Data collection and data analysis were conducted simultaneously. All transcripts were imported into NVivo V.11.0 software and were independently coded by the first and second authors. Any discrepancies were discussed by the research group to reach consensus. The analysis was conducted using the directed content analysis approach.¹⁸ The steps of the analysis included the followings: (1) The transcripts that reflected the influencing factors of health promotion behaviour of patients with AD were used as the minimum analysis units. (2) The initial data were reviewed and read repeatedly. (3) The COM-B model was used as a framework to categorise the unit of analysis. (4) The significant ideas and concepts in the data were coded and marked, and similar codes were classified into corresponding categories to form themes and sub-themes. (5) The results were interpreted and analysed, and the link between the data and the results was formed. The quotations were translated into English by professional translators who were not part of the research team using the forward-backward method.¹⁹

Rigour

The rigour of this study was achieved in the following ways. First, the COREQ criteria were used to guide the reporting of this study. Second, a heterogeneous sample was deliberately chosen to ensure adequate representation of diverse perspectives and experiences. Additionally, field notes were consistently maintained to ensure comprehensive and detailed data collection. Finally, two researchers conducted independent data analysis and consulted with the research team to form the final coding and themes.

RESULTS

Participant characteristics

Table 1 shows the characteristics of participants. The sample included 16 participants (25 participants were

Table 1 Participant characteristics (n=16)

Variables	
Age, years (range)	47.06 (23–75)
Time of AD diagnosis, months (range)	23.66 (4–84)
Gender	
Male	10 (62.5)
Female	6 (27.5)
Education levels	
Primary school or below	3 (18.75)
Middle school	7 (43.75)
High school	3 (18.75)
College or above	3 (18.75)
Classification of AD	
Stanford type A	9 (56.25)
Stanford type B	7 (43.75)

approached but nine did not fulfil inclusion criteria or refused to participate): 10 men (67.50%) and six women (32.50%). Ages ranged from 23 to 75 years (mean 47.06, SD 14.53). Time of AD diagnosis ranged from 4 months to 7 years.

Themes

The themes and subthemes based on the COM-B model are presented in [table 2](#).

Capability

Capability refers to an individual's physical and psychological capability to engage in relevant activities. Psychological capability refers to the knowledge and psychological

skills involved in necessary thinking processes. Physical capability refers to physical skills, strength or endurance.

Psychological capability

Lack of disease knowledge

Many patients exhibited a lack of essential knowledge and understanding regarding the diverse causes and associated risks of AD. Some patients expressed that they had been completely unaware of AD prior to this experience.

I had never heard of this disease. I had consistently regarded myself as being in good health. Could it potentially be a misdiagnosis by the doctor? (No 3, female, mid 30s)

Some patients were aware of the importance of dietary modification and physical activity in promoting their general well-being. However, their knowledge in these areas was inadequate. Due to a lack of nutritional knowledge, some patients adopted harmful dietary patterns.

I attributed my illness to obesity. Consequently, I rigorously followed a vegetarian diet and markedly decreased my meat consumption. (No 9, male, late 50s)

Some patients reported that they did not know about the kind of exercises required for this condition and expressed their concern about potential adverse effects following physical activity.

I used to run regularly, but I recently stopped due to concerns about the potential risk of over-exercising triggering a relapse. (No 14, female, early 20s)

Physical capability

Fatigue

Some patients indicated that the physical symptoms associated with the disease, such as fatigue, considerably hinder their ability to participate in daily activities, thus detrimentally affecting their quality of life and mental well-being.

Previously, I was capable of working continuously throughout the day, yet currently, I easily feel fatigued after only a short period of work. (No 8, female, late 40s)

Physical function limitation

Some patients reported that they faced many challenges when starting the health promotion programme due to decreased physical function and comorbidities.

I am eager to participate in the suggested exercises. However, my advanced age and visual impairments pose considerable challenges. Furthermore, following a stroke I suffered 2 years ago, my mobility has been negatively impacted, making it difficult to maintain a consistent daily exercise regimen. (No 7, male, mid 70s)

Table 2 Themes and subthemes

COM-B model	Themes	Subthemes
Capability	Psychological	Lack of disease knowledge
	Physical	Fatigue
		Physical function limitation
Opportunity	Physical	Limited access to disease knowledge
		Communication between providers and patients
		Objective condition restriction
	Social	Stigma
		Social support
Motivation	Reflective	Self-efficacy
		Perceived benefits
		Personal and family responsibilities
	Automatic	Post-traumatic growth
		Fear of disease progression

Opportunity

Opportunity refers to external factors that enable or prompt the behaviour, including physical opportunity (time, resources, etc) and social opportunity (perceptions, interpersonal influence, etc).

Physical opportunity

Limited access to disease

Because of insufficient exposure to AD, medical staff emerged as the primary source of disease knowledge for patients. Many patients, particularly the elderly and those with lower levels of education, faced challenges in obtaining information from diverse sources.

My formal education is constrained, and I am neither literate nor able to access the internet. Therefore, I primarily acquire knowledge through interactions with healthcare professionals such as doctors and nurses. (No 4, female, early 50s)

Communication between providers and patients

It was observed that there was inadequate communication between medical staff and patients. Most patients complained that they could not obtain sufficient information about their diseases and treatments from medical staff because they were occupied with their work most of the time.

The doctor only told me that I need to take these medications for life. I wanted to know more details from them, but they were always very busy. (No 9, male, late 50s)

Objective condition restriction

Due to financial and geographical constraints, patients were restricted to choosing nearby hospitals, and they were unable to access higher-quality medical services.

I had originally intended to go to the hospital. However, I chose to remain silent as I understood our situation at home and acknowledged that we could not afford the necessary treatment. (No 16, male, early 50s)

Social opportunity

Stigma

Some patients were afraid to disclose their disease because of social stigma. People with AD are often considered weak and unable to live normally.

I am afraid that my relatives and friends might tease me about my disease, so I prefer to be alone. I feel inferior and ashamed. (No 3, female, mid 30s)

Social support

Most patients identified the importance of social influence through support from family and friends as important facilitators of health behaviour participation.

My mother specially learnt nutrition knowledge, and combined with my taste preferences and physical conditions, carefully selected various kinds of healthy food for me. (No 11, male, late 20s)

Sincere support from peers can offer significant emotional and psychological assistance, thereby enabling patients to approach their condition with a more optimistic perspective.

I joined the patients association, where I met numerous members who faced similar challenges. We provided mutual support and encouragement. This collective strength significantly bolstered my confidence in recovery. (No 2, male, early 30s)

Motivation

Motivation refers to the brain processes that energise and direct behaviour, which is divided into reflective motivation (planning and evaluation) and automatic motivation (emotions, impulses, etc).

Reflective motivation

Self-efficacy

Self-efficacy was most commonly mentioned as a barrier or facilitator of health-related behaviour change. A high level of self-efficacy could effectively stimulate patients' subjective initiative, motivating them to actively adopt and maintain health behaviour rather than merely complying passively.

The process of smoking cessation was inherently challenging. Whenever I experienced a craving for smoking, I redirected my attention by listening to music. (No 12, male, late 30s)

Conversely, patients with low self-efficacy tended to take no action or give up easily when facing challenges.

Controlling excessive eating has always been a formidable challenge for me. It might be possible to persist for a while, but not in the long term. (No 13, male, early 40s)

Perceived benefits

Some patients reported that they experienced observable effects such as significant weight loss, improved physical condition or a reduction in medication prescriptions, which were beneficial and facilitated health behaviour change.

I practiced Tai Chi every morning, which helped me achieve physical and mental relaxation, and enhanced my body coordination and mental clarity. (No 5, male, early 60s)

Personal and family responsibilities

Some patients exhibited a strong intrinsic motivation to engage in behaviour change, which was driven by personal and family responsibilities.

As the primary financial provider for my family, I could not afford to endure similar health crises again. I had to take effective measures to protect my health. (No 6, male, late 30s)

Automatic motivation

Post-traumatic growth

Although AD is a stressful, challenging and traumatic event, this difficult experience may promote personal growth for AD survivors, known as post-traumatic growth. Some patients reported that the diagnosis and surgery had provided them with motivation to engage in new possibilities for health behaviour to avoid future complications and appreciate the value of life.

My illness has served as a catalyst for personal growth and has made me realise the importance of appreciating life, because you never know what's going to happen. (No 2, male, early 30s)

Fear of disease progression

Some patients expressed that their fear of disease progression motivated them to take effective secondary and tertiary prevention strategies in order to control or eliminate risk factors associated with complications.

AD was a significant wake-up call. I'm afraid of a relapse, so I tried to eat healthier to prevent it. (No 12, male, late 30s)

DISCUSSION

To our knowledge, this is the first qualitative study to apply the COM-B model to explore the influencing factors of health promotion behaviour in patients with AD. These findings will contribute to the development of an appropriate and feasible behaviour change intervention to promote behaviour change in patients with AD.

Capability

The psychological capability of patients was primarily hindered by inadequate knowledge and misconceptions regarding AD. Consistent with a previous study,⁵ patients with AD in this study often had an insufficient understanding of the disease, its progression and its management, coupled with a desire for further knowledge. Knowledge and cognition play a crucial part in seeking treatment and changing behaviour. These abilities can be effectively enhanced by providing knowledge education and coping strategy training based on the Behaviour Change Wheel.¹² This study found that barriers related to physical capability, such as treatment side effects, fatigue and comorbidities, were the main limitations to engaging in health promotion behaviour, similar to previous findings in other populations.^{20 21} Fatigue is a common symptom experienced among patients with AD and has a severe impact on quality of life.²² Patients reported experiencing fatigue that interfered with their ability to

participate in daily life activities, resulting in an inability to live and work normally. Fatigue was also associated with a range of psychological disorders, such as anxiety and cognitive impairment.^{23 24} Given the impact of fatigue, measuring and attending to fatigue may be important in promoting early intervention. Interventions should focus on cognitive behavioural therapy, exercise-related interventions or energy management education to alleviate fatigue.^{25 26} Comorbidities were a frequent barrier for patients participating in health promotion.²⁷ It is crucial to tailor personalised health promotion programmes for patients with AD and specific comorbidities.

Opportunity

In this study, we identified that specific physical opportunities associated with healthcare systems and medical staff may contribute to delays in diagnoses and irregular follow-ups. To improve the healthcare system, continued financial and healthcare support is needed, as well as increased establishment of mobile health service platforms, telemedicine, and other accessible forms of healthcare. Communication between providers and patients was identified as one of the most important barriers to behaviour change in terms of physical opportunity. Consistent with a previous study, this study found that staff failed to meet patients' needs for communication and adequate information.²⁸ This may be due to the staff's demanding workloads or a lack of time and consultation skills. In China, the shortage of human resources and the heavy workload have seriously hindered the effective communication between medical staff and patients. Therefore, training in communication skills should be provided to medical staff, enabling them to implement strategies to overcome communication barriers with patients. An alternative solution to this problem may be to use mobile phone text messages to enhance treatment compliance,²⁹ or to train allied health professionals or nurses in counselling services.³⁰ Although stigma has been identified as a barrier to seeking care and adhering to treatment,³¹ to the best of our knowledge, this study is the first to document the adverse impact of stigma on health promotion behaviour change in patients with AD. Some patients reported that it is difficult to talk about their concerns with friends due to fears of being perceived as disabled, viewed differently and treated unfairly. Therefore, addressing the psychological burden, improving disclosure skills, and raising public awareness of AD are essential. Studies have adopted the health stigma and discrimination framework in diverse contexts to address barriers associated with stigma in behaviour change.³² Social support was the primary barrier or facilitator in health behaviour change.³³ Consistent with a prior study, this study found that especially partners and family play an indispensable role in disease management and support.³⁴ Furthermore, peer support was important.³⁵ Therefore, involvement of family and peers should be considered an important intervention for improving health behaviour change.

Motivation

Self-efficacy was a significant determinant influencing behaviour change and maintenance within AD, which is in line with the findings of previous studies.^{36,37} Patients with low self-efficacy reported a lack of confidence in their ability to adhere to dietary recommendations and engage in physical activity. Therefore, interventions should focus on improving self-efficacy to promote long-term behaviour change. This can be achieved through behaviour change techniques, such as setting specific goals and self-monitoring.³⁸ Perceived benefits were identified as facilitators related to reflective motivation. This is consistent with previous studies on chronic disease and cancer populations.^{39,40} Interestingly, fear of disease progression was a motivating factor for health behaviour change in patients with AD. Some patients indicated that fear of AD recurrence is often present and leads to motivation to make changes to promote their health in order to reduce the risk of recurrence. Previous studies have also emphasised that the fear of disease progression is one of the common psychological reactions and facilitators in patients with stroke.^{36,41} This study found that changes in patient motivation were a process of calculated risk, similar to the findings of a sexual health behaviour study, where risk–benefit analyses influence motivation.¹⁴ Therefore, patients' awareness of personal risks and the impact of potential disease should be raised to motivate them to adhere to changes in health behaviour at an early stage. Furthermore, post-traumatic growth was identified as a facilitator. After a traumatic illness experience, AD survivors showed closer intimate relationships, positive changes in spirituality, and an increased appreciation of life. Such findings are consistent with previous studies conducted in cancer populations.^{42,43} Previous studies have also shown that post-traumatic growth is strongly associated with health-related behaviour changes.^{44,45} So far, interventions have focused on other patient and survivor groups, and more research is needed to learn more about particularities in survivors of AD. A recent meta-analysis focusing on patients with cancer showed that psychosocial interventions including supportive group psychotherapy and multiple health behaviour change interventions increased post-traumatic growth.⁴⁶

Limitations

This study has some limitations. First, the study was qualitative and failed to explore the extent to which ability, opportunity and motivation factors influenced patients' health promotion behaviour. Second, it relied on patients' self-reported data, which may be influenced by memory bias and social desirability bias. In addition, the sample was small and patients were recruited from the hospital, while patients from other settings, such as communities, were not recruited. Therefore, generalisability of findings to other settings may be limited. In the future, quantitative and longitudinal studies are needed with large samples to further explore the research results.

Conclusions

This study adopted a qualitative approach and conducted interviews with 16 patients with AD to analyse the

influencing factors of their health promotion behaviour based on the COM-B model. This study demonstrated that psychological capability, physical and social opportunity, and reflective and automatic motivation are crucial factors for explaining health promotion behaviour in patients with AD. These findings can be applied to design interventions for practice and further research to promote better implementation of health behaviour.

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Contributors YL acts as the guarantor. LC and YL designed the study. JG and QP performed data collection and analysis and wrote the original draft of the manuscript. SLL, SC and BL were involved in the data analysis. LC and YL revised the draft critically. All authors commented on the manuscript and approved the final manuscript.

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Competing interests None declared.

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Patient consent for publication Not applicable.

Ethics approval This study involves human participants and was approved by The Ethics Committee of the Fujian Medical University Union Hospital (2022KY189). Participants gave informed consent to participate in the study before taking part.

Provenance and peer review Not commissioned; externally peer reviewed.

Data availability statement Data are available upon reasonable request.

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