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Knowledge, attitude and practice towards postoperative management among patients with type A aortic dissection or their relatives: a cross-sectional study in China

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ABSTRACT

Objectives To assess the knowledge, attitude and practice (KAP) of patients with type A aortic dissection (AD) or their relatives regarding postoperative management.

Design Cross-sectional study.

Setting The participants were recruited from three hospitals between October 2022 and February 2023.

Participants Patients diagnosed with type A AD or their relatives.

Interventions No interventions were administered. A structured questionnaire was used to gather the demographic and KAP data from the participants.

Primary and secondary outcome measures The outcome measures included the levels of KAP regarding postoperative management.

Results A total of 483 participants were included. They exhibited poor knowledge (15.52±7.67, possible score: 0–32), positive attitude (31.10±5.86, possible score: 9–45) and poor practice (21.96±4.83, possible score: 8–40) towards postoperative management. The multivariable logistic analysis showed that knowledge scores (OR=1.09, 95% CI 1.05 to 1.12, p<0.001), attitude scores (OR=1.22, 95% CI 1.16 to 1.29, p<0.001) and diagnosis for ≤5 years (OR=1.97, 95% CI 1.23 to 3.15, p=0.005) were independently associated with good practice. The structured equation modelling analysis showed that knowledge directly influenced attitudes (β=0.22, p<0.001) and practice (β=0.15, p<0.001), while attitude directly impacted practice (β=0.52, p<0.001) and mediated the relationship between knowledge and practice (β=0.11, p<0.001).

Conclusions Patients with type A AD and their relatives have poor knowledge, positive attitudes and poor practice towards postoperative management. Knowledge might be the prerequisite for practice, and attitudes have a mediating effect.

STRENGTHS AND LIMITATIONS OF THIS STUDY

⇒ *Cross-sectional design:* the study employs a cross-sectional design, allowing for the simultaneous assessment of knowledge, attitude and practice (KAP) regarding postoperative management in a large sample from multiple hospitals.
⇒ *Large sample size:* with 483 participants, the study benefits from a substantial sample size, enhancing the reliability and generalisability of the findings related to KAP.
⇒ *Structured questionnaire*: the use of a structured questionnaire ensures a standardised approach to data collection, facilitating the accuracy and consistency of the KAP assessments.
⇒ *Cross-sectional nature*: the cross-sectional design limits the ability to draw causal inferences about the relationships between KAP over time.
⇒ *Single time point data collection*: the data were collected at a single time point, which may not reflect changes in KAP over different postoperative stages or durations.

INTRODUCTION

Thoracic aortic dissection (AD) refers to the disruption of the media layer of the aorta with bleeding within and along the wall of the aorta, resulting in the separation of the aorta layers that leads to the formation of a true and false lumen with or without communication.[1 2] AD includes type A (all dissections involving the ascending thoracic aorta and/or arch regardless of origin) and type B (all dissections involving only the descending thoracic aorta regardless of origin) (Stanford classification).[1] The incidence of type A AD is higher than type B AD.[3] The mortality rate of patients with type A dissection is 40%, followed by an increase of 1% per hour.[1] The prognosis is also worse for type A AD than for type B.[3] The only effective management is surgery.[1 2] Still, mortality is 5%–35% after the operation, mainly due to myocardial infarction, low cardiac output, respiratory failure, renal failure and stroke.[1]

Among survivors, proper postoperative management is crucial to maintain quality of life and prevent recurrences and complications.[4–8] Indeed, symptoms after an operation for type A AD include back and chest pain, chest tightness, dizziness and weakness.[7] After surgery, patient discomfort is closely related to the quality of life and work capability.[9 10] It is an important determinant of psychological distress, stress, anxiety and depression,[11] which can translate into new adverse cardiovascular events.[12] The patients are recommended to participate in cardiac rehabilitation by performing appropriate exercises to restore the usual activities of daily living.[13–15] A study showed that the prognosis of AD was poorer in patients with inadequate blood pressure control and not taking β-blockers.[16] The patients also have to follow the physician's advice for medication and follow-up and undergo proper management of related psychological conditions like anxiety and depression.[13–15] Several of these recommendations require specific knowledge to be performed adequately. Indeed, proper knowledge of the symptoms that should prompt an emergency visit or a regular consultation, the proper lifestyle habits (diet, exercise, sleep, etc) to adopt and maintain, undergo planned examinations and hospital visits, and medications are essential to optimise survivorship and prognosis.[4–8] Furthermore, the family members of the patients play an important role in postoperative self-management by helping the patients perform some tasks, remembering the physician's instructions and encouraging them to maintain good lifestyle habits. Therefore, evaluating the knowledge and performance of the patients and their caregivers towards AD management is essential to optimise prognosis.

Knowledge, attitude and practice (KAP) studies allow the identification of knowledge gaps and attitude and practice barriers to correctly implementing a given set of actions in a specific population.[17 18] KAP data about self-management among AD survivors are scarce. A study revealed that medication adherence among AD survivors was only 64%, indicating poor practice.[19] Another study highlighted the need for antihypertensive medication adherence after AD but also reported that adherence was low among patients with AD, again indicating poor practice.[20] A study suggested that the attitude of the patients after AD is relatively poor due to low self-efficacy.[21] A study in Norway showed that a diagnosis of aortopathies, including AD, is challenging to the patients and results in poor self-management.[22]

Still, KAP is highly dependent on countries, medical systems, economy and sociocultural factors,[17 18] and data are lacking for Chinese patients. Therefore, this study aimed to assess the KAP towards postoperative management among Chinese patients with type A AD or their relatives.

METHODS

Study design and participants

This cross-sectional study enrolled patients with type A AD or their relatives in the Fuwai Hospital, Shandong Provincial Hospital or the Affiliated Hospital of Xuzhou Medical University between October 2022 and February 2023. The inclusion criteria were (1) ≥18 years of age, (2) patients with type A AD who underwent an AD operation in Fuwai Hospital or their relatives and (3) consent to participate in this study. The exclusion criteria were (1) impaired cognitive function or (2) communication impairment. This study was approved by the Ethics Committee of Fuwai Hospital (No: 2022–1745). Written informed consent was obtained from the participants. All procedures were performed in accordance with the ethical standards laid down in the 1964 Declaration of Helsinki and its later amendments.

Questionnaire and quality control

The questionnaire was designed with reference to the relevant literature[23 24] and the American Association for Thoracic Surgery expert consensus document: Surgical Treatment of Acute Type A Aortic Dissection[25] and the Chinese Expert Consensus on the Diagnosis and Treatment of Aortic Dissection.[26] The first draft was revised according to the comments from four experts. A pilot study (n=50) was conducted with Cronbach's α of 0.879, indicating good reliability.

The final version of the questionnaire was in Chinese and included 55 items: 21 for demographic information, 16 for knowledge, nine for attitude and nine for practice. The knowledge items K1-13 were scored 2 points for 'know well', 1 for 'partially know' and 0 for 'don't know', while K14-16 were scored 2 points for each correct answer and 0 for each wrong answer or 'don't know'; the possible knowledge score range was 0–32. The attitude and practice items were scored using a 5-point Likert scale, according to the degree of positivity. Among the attitude items, A3, A7, A8 and A9 were scored from 'strongly agree' (5 points) to 'strongly disagree' (1 point), while A1, A2, A4, A5 and A6 were scored reversely; the possible attitude score range was 9–45. Item P8 was designed to investigate the factors that might be associated with the regular follow-up of patients, but it was not assigned a score. The other practice items were all scored from 'completely compliant' (5 points) to 'not compliant at all' (1 point), and the total score of practice ranged from 8 to 40. Scores ≥60% for KAP were considered adequate knowledge, positive attitude and proactive practice.

The participants were recruited during regular in-person or telephone follow-ups. The questionnaire was uploaded to the Wenjuanxing e-questionnaire platform (Wenjuanxing Tech Co., Ltd., Changsha, China). A link to the e-questionnaire was obtained and was sent as a WeChat link (for the patients with a WeChat account) or SMS (for those without a WeChat account). After data collection was completed, the questionnaires were checked for quality by members of the research team. Any questionnaires with incomplete demographic information were completed via telephone contact. In order to avoid a mutual influence bias, if a patient and their relatives both completed the questionnaires, only the

questionnaire from the patients was kept. Questionnaires with obvious logical errors, two or more unanswered questions, or an obvious pattern of choosing the same options of all KAP items (eg, all first choices) were considered invalid and were not included in the analysis.

Statistical analysis

Stata 17.0 (Stata Corporation, College Station, TX, USA) was used for statistical analysis. The continuous variables were expressed as means±SDs and analysed using Student's t-test (comparison of two groups) or analysis of variance (comparison among multiple groups). The categorical variables were expressed as n (%) and analysed using the χ^2 test. The stratified analysis was performed among patients with and without aortic valve replacement. The independent risk factors associated with the KAP dimensions were analysed using multivariable logistic regression. The variables with p<0.05 in the univariable logistic regression analyses were included in the multivariable analyses. Structural equation modelling (SEM) was performed on all participants to verify the hypotheses that (H1) knowledge of postoperative management had a direct effect on attitude, (H2) knowledge of postoperative management had a direct effect on practice and (H3) attitude towards postoperative management had a direct effect on practice. However, the subgroups were too small to conduct a reliable SEM analysis. While a path analysis could be considered for the family members, the sample size was insufficient even for this approach. Two-sided p <0.05 were considered statistically significant.

Patient and public involvement

Apart from their participation as study participants, the patients or the public were not involved in this study.

RESULTS

A total of 542 questionnaires from 542 participants were collected, and 59 were excluded due to obvious logical errors, two or more unanswered questions or an obvious response pattern, resulting in 483 valid questionnaires (validity rate of 89.11%). The majority of the participants were 41–50 years old (27.95%), male (65.01%), married (92.34%), lived in urban areas (60.25%), with middle school education (39.13%) and employed (45.13%). Nearly two-thirds (65.22%) of the participants were family members. The majority of the patients were completely able to take care of themselves (85.71%), without aortic valve replacement (74.12%) and 5–10 years after the operation (48.86%). After validating with the medical records, only 393 participants (81.37%) answered the question on the type of operation correctly (figure 1, online supplemental table 1). The characteristics are presented separately for the patients (online supplemental table 2) and the family members (online supplemental table 3).

The KAP scores were 15.52±7.67 (48.50%, possible score: 0–32), 31.10±5.86 (69.11%, possible score: 9–45) and 21.96±4.83 (54.90%, possible score: 8–40), indicating poor knowledge, positive attitude and poor practice towards self-management after AD. The items indicating poor knowledge included K4 (59.63%; 'some patients who have undergone aortic dissection may require further

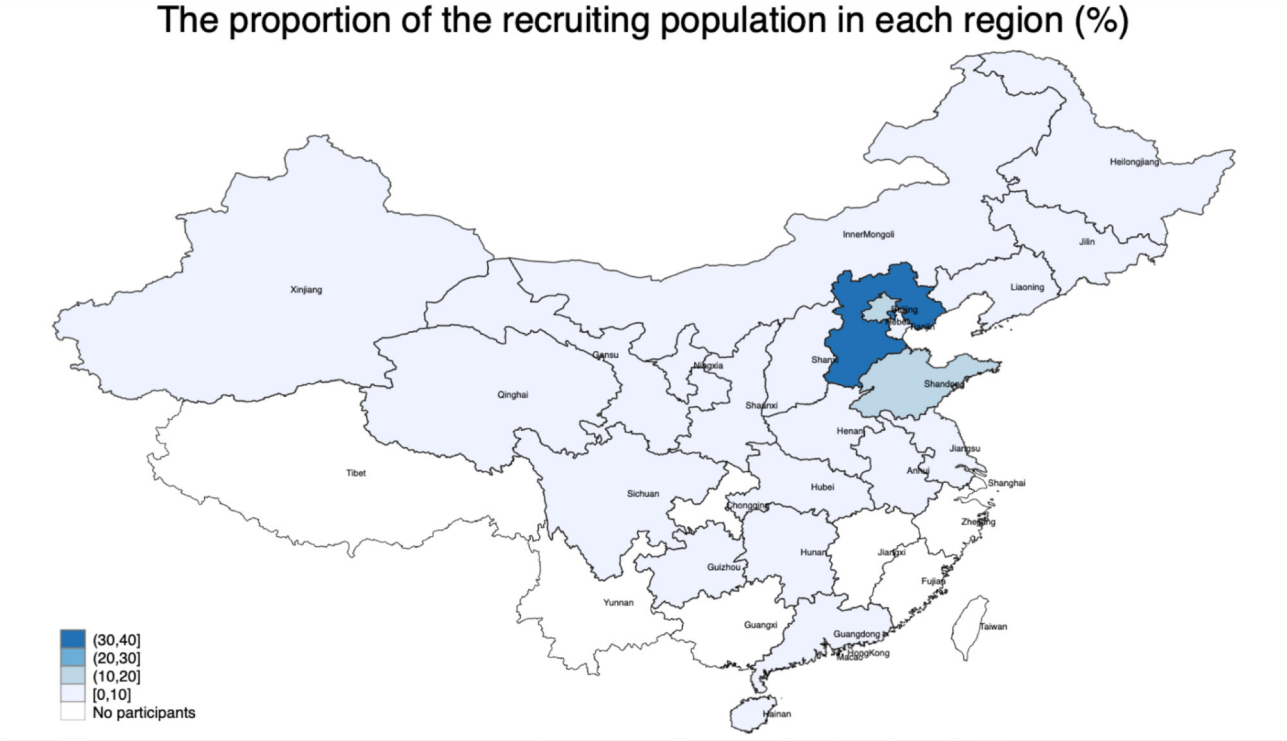

Figure 1 Countrywide distribution of the participants.

surgical intervention'), K5 (57.97%; 'some patients with aortic dissection need an aortic valve replacement, and some do not'), K6 (53.83%; 'the two main types of aortic valves are mechanical and bioprosthetic'), K7 (45.34%; 'if aortic valve replacement is combined, the mechanical valve needs to take warfarin anticoagulation for life, and the biological valve needs 3–6 months of warfarin anticoagulation') and K10 (53.83%; 'If β-blockers are not effective in antihypertensive, ACEI, ARB, CCB and other antihypertensive drugs can be combined under the guidance of a specialist'). There were some items of knowledge that differed between patients who have undergone aortic valve replacement and those who have not (K3, K5–12, all p<0.05) (online supplemental table 4). The majority of the patients and family members (87.58%) agreed that 'it is important to monitor and control blood pressure after aortic dissection operation' (A3) (online supplemental table 5). However, only 103 (21.33%) reported that they monitored or supervised their patients' family members to monitor their blood pressure daily (A6) (online supplemental table 6). The most important factors associated with regular follow-up were time issues (57.14%), psychological reasons (44.10%) and economic reasons (42.86%) (online supplemental figure 1). The practice items are presented separately for the patients (online supplemental table 7) and the family members (online supplemental table 8).

In all participants, the knowledge scores were correlated to the attitude (r=0.285, p<0.001) and practice (r=0.414, p<0.001) scores. The attitude scores were correlated to the practice scores (r=0.697, p<0.001). In the family members, the knowledge scores were correlated to the attitude (r=0.249, p<0.001) and practice (r=0.428, p<0.001) scores. The attitude scores were correlated to the practice scores (r=0.633, p<0.001).

The multivariable analysis showed that high school/technical secondary school education (OR=4.58, 95% CI 1.49 to 14.13, p=0.008), college education and above (OR=4.15, 95% CI 1.36 to 12.61, p=0.012), monthly income ¥2000–¥5000 (OR=2.20, 95% CI 1.08 to 4.51, p=0.031), monthly income ¥5000–¥10 000 (OR=2.36, 95% CI 1.08 to 5.10, p=0.031), monthly income >¥10 000 (OR=3.15, 95% CI 1.28 to 7.75, p=0.013) and aortic valve replacement (OR=5.42, 95% CI 3.36 to 8.74, p<0.001) were independently associated with adequate knowledge (figure 2A). The knowledge scores (OR=1.07, 95% CI 1.04 to 1.10, p<0.001), high school/technical secondary school education (OR=3.56, 95% CI 1.51 to 8.38, p=0.004), college education and above (OR=11.08, 95% CI 4.39 to 27.98, p<0.001), monthly income ¥2000–¥5000 (OR=0.30, 95% CI 0.15 to 0.60, p<0.001), monthly income ¥5000–¥10 000 (OR=0.21, 95% CI 0.10 to 0.45, p<0.001) and diagnosis for ≤5 years (OR=1.88, 95% CI 1.15 to 3.09, p=0.012) were independently associated with positive attitudes (figure 2B). The knowledge scores (OR=1.09, 95% CI 1.05 to 1.12, p<0.001), attitude scores (OR=1.22, 95% CI 1.16 to 1.29, p<0.001) and diagnosis for ≤5 years (OR=1.97, 95% CI 1.23 to 3.15, p=0.005) were independently associated with proactive practice (figure 2C).

The SEM analysis of all participants showed that knowledge of postoperative management had a direct effect on both attitude (β=0.22, p<0.001) and practice (β=0.15, p<0.001). Attitude towards postoperative management directly influenced practice (β=0.52, p<0.001) and played a role as an indirect mediator between knowledge and practice (β=0.11, p<0.001) (figure 3).

Similarly, the path analysis in family members showed that knowledge of postoperative management had a direct effect on both attitude (β=0.295, p=0.003) and practice (β=0.253, p=0.015). Attitude towards postoperative management influenced practice (β=0.660, p=0.010) and played a role as an indirect mediator between knowledge and practice (β=0.195, p=0.002) (online supplemental table 9, online supplemental figure 2).

DISCUSSION

The present study suggests that Chinese patients with type A AD and their relatives have poor knowledge, positive attitudes and poor practice of AD postoperative management. It is the first KAP study about AD postoperative self-management in China. The results could help identify the barriers to adequate self-management in patients with chronic AD and design interventions to improve it.

The postoperative management after AD includes cardiac rehabilitation, performing appropriate exercises, restoring the usual activity of daily living, following the physician's advice for medication and follow-up, and management of psychological issues that could interfere with survivorship and prognosis.[13–15] Adhering to self-management involves changing life habits, often dramatically (eg, stopping smoking and/or drinking), which can be difficult for several people. Indeed, a study showed that a cardiovascular event is a life-changing event that motivates several people to change their lifestyle habits, but that the prevalence of unhealthy lifestyle habits remains high despite the cardiovascular event.[27] It has been estimated by the American Heart Association that only 5% of individuals (although not necessarily with a past cardiovascular event) follow cardiovascular health advice.[28] Besides being told what to do to improve prognosis and survival, actually knowing the possible consequences of poor self-management and how it could translate into poor prognosis could help the patients follow the physicians' advice. Unfortunately, the present study showed that the Chinese patients who underwent surgery for type A AD had poor knowledge and poor practice towards postoperative self-management. On the other hand, their attitudes were positive, which could be related to the will to live and adequate survivorship after an acute cardiovascular event.[29] According to the KAP theory, knowledge is the basis for practice, and attitude is the force driving practice.[17 18] Hence, proactive practice requires both adequate knowledge and positive attitudes. Unfortunately, few data are available regarding

A

Variable	OR (95% CI)	P
Type of residence		
Rural	Reference	
Urban	0.68 (0.39 to 1.20)	0.187
Suburban	0.56 (0.26 to 1.18)	0.125
Education		
Primary school and below	Reference	
Middle School	2.86 (0.99 to 8.29)	0.052
High school/technical secondary school	4.58 (1.49 to 14.13)	0.008
Junior college and above	4.15 (1.36 to 12.61)	0.012
Income, CNY		
<2000	Reference	
2000-5000	2.20 (1.08 to 4.51)	0.031
5000-10,000	2.35 (1.08 to 5.10)	0.031
>10,000	3.15 (1.28 to 7.75)	0.013
With or without aortic valve replacement		
With	5.42 (3.36 to 8.74)	<0.001
Without	Reference	
Number of surgical operations for aortic dissection		
Once	Reference	
Twice and above	2.07 (0.98 to 4.37)	0.056

B

Variable	OR (95% CI)	P
Knowledge score	1.07 (1.04 to 1.10)	<0.001
Education		
Primary school and below	Reference	
Middle School	1.94 (0.91 to 4.11)	0.084
High school/technical secondary school	3.56 (1.51 to 8.36)	0.004
Junior college and above	11.08 (4.39 to 27.98)	<0.001
Work status		
Employed	Reference	
Unemployed	1.31 (0.52 to 3.30)	0.562
Retired	1.48 (0.80 to 2.76)	0.214
Self-employed	0.94 (0.51 to 1.73)	0.831
Other	2.16 (0.95 to 4.88)	0.065
Income, CNY		
<2000	Reference	
2000-5000	0.30 (0.15 to 0.60)	<0.001
5000-10,000	0.21 (0.10 to 0.45)	<0.001
>10,000	0.53 (0.19 to 1.49)	0.227
Duration since diagnosis of aortic dissection (years)		
≤5	1.88 (1.15 to 3.09)	0.012
(5,10)	Reference	
≥10	1.05 (0.58 to 1.90)	0.866

C

Variable	OR (95% CI)	P
Knowledge score	1.09 (1.05 to 1.12)	<0.001
Attitude score	1.22 (1.16 to 1.29)	<0.001
Education		
Primary school and below	Reference	
Middle School	0.89 (0.37 to 2.12)	0.792
High school/technical secondary school	0.57 (0.22 to 1.46)	0.239
Junior college and above	0.76 (0.31 to 1.87)	0.555
Duration since diagnosis of aortic dissection (years)		
≤5	1.97 (1.23 to 3.15)	0.005
(5,10)	Reference	
≥10	0.85 (0.45 to 1.62)	0.618
Number of surgical operations for aortic dissection		
Once	Reference	
Twice and above	2.26 (1.00 to 5.13)	0.051

Figure 2 Forest plots of the factors associated with adequate knowledge (A), positive attitude (B) and proactive practice (C). CNY, Chinese yuan.

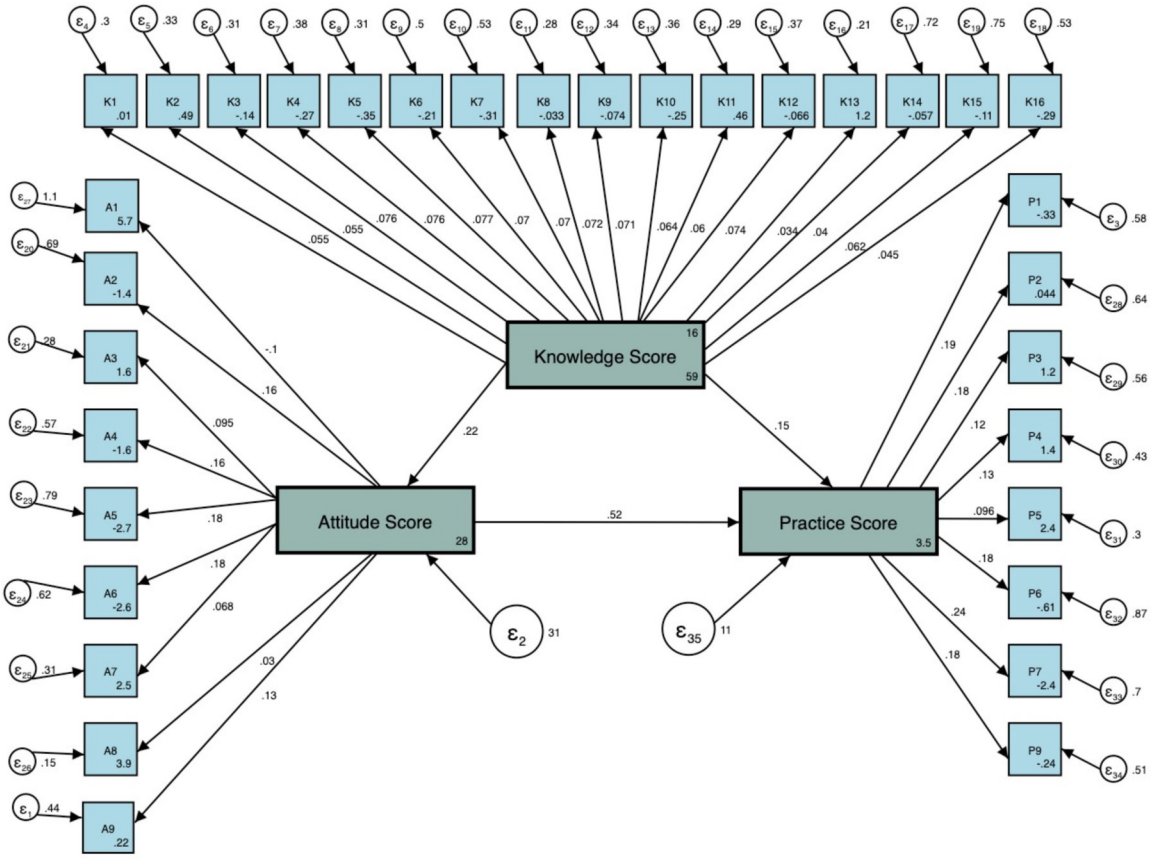

Figure 3 Structural equation modelling (SEM) of knowledge, attitudes and practice towards postoperative self-management after aortic dissection. Green denotes latent variables, and blue denotes observed variables.

the KAP towards self-management among AD survivors. Previous studies reported poor medication adherence among AD survivors,[19 20] which is a kind of poor practice and supports the poor practice observed here. A study from Northern Europe showed poor self-management among patients with AD,[22] also indicating poor practice and supporting the poor KAP status regarding AD postoperative self-management observed here in Chinese patients. The present study evaluated the KAP towards general AD self-management, which went beyond the previous studies that evaluated specific points. Hence, the present study provides a more comprehensive picture than the previous studies, but there is a lack of literature for comparison.

In addition, KAP depends on countries, medical systems, economy and sociocultural factors,[17 18] and data from a country cannot be applied to another country without validation. Healthcare in China has undergone basic changes over the twentieth and twenty-first centuries and is based on public and private medical institutions and insurance programmes. In 2020, 95% of the population had at least basic health insurance coverage. Basic medical insurance includes employee medical insurance (covers the urban employed population) and resident medical insurance (covers the non-employed urban and rural populations). Despite this, public health insurance generally covers only about half of medical costs, in opposition to countries with universal medical insurance, where the patients pay nothing, and countries without universal medical insurance, where non-insured people pay the complete costs. In China, there are 1.5 physicians and 2.4 hospital beds per 1000 inhabitants.[30] Although there is a change tendency among the younger generations, there is some discomfort in China regarding modern Western medicine, and some favour towards traditional Chinese medicine. Still, the interaction between the two types of medicine is not found elsewhere.[31 32] Therefore, the differences in healthcare systems between China and other countries are profound enough to justify a study specifically in China. In addition, previous studies mostly focused on medication adherence (ie, an aspect of practice),[19 20 22] while the present study also examined knowledge, attitudes and other aspects of practice.

The present study innovated by identifying the factors associated with the KAP towards self-management after surgery for AD. It could help target the patients at higher risk of poor KAP and who would benefit the most from educational interventions. Among the knowledge items, the patients appeared to have a low understanding of the possibility of reoperation, the possibility of a requirement for aortic valve replacement in some patients, the types of artificial aortic valves and the need for lifelong anticoagulation therapy with mechanical valves. Aortic valve

replacement was independently associated with knowledge, probably because of the design of several valve-related questions in the knowledge dimension. In addition, the patients who underwent aortic valve replacement might be more likely to have knowledge regarding those items than those without aortic valve replacement because they sought information by themselves or received more information from their healthcare providers. On the other hand, aortic valve replacement was not associated with the attitude and practice scores, probably because it is an accessory procedure to AD operation that will not change or add supplementary care items to the postoperative self-management of AD. Therefore, it has little influence on their attitude and practice. About two-thirds of the study population was family members. It is, therefore, possible that they were informed by the surgeons that their relative with AD underwent aortic valve replacement, and they had the opportunity to ask questions.

Higher education and higher income were associated with better knowledge. It is well-known that health literacy is related to socioeconomic status.[33] In the present study, although knowledge scores and higher education were associated with higher attitude scores, a higher income was associated with lower attitude scores. That discrepancy is difficult to interpret but could be related to patients, and their relatives with a higher income might rely more on professionals for management rather than focusing on self-management. In contrast, low-income patients and relatives will use the medicine they can afford and self-administer reliably.[34] That point warrants further study. Although urban/rural places of residence were not independently associated with KAP, it is well known that education, income and general socioeconomic status are widely different between urban and rural areas in China.[35] A comprehensive nationwide prospective cohort study revealed a notable contrast in the risk of all-cause mortality between individuals with varying levels of education. Compared with residents possessing a college-level education or higher, those with only a primary school education or below exhibited a heightened risk of all-cause mortality. Furthermore, the study observed distinct patterns in health outcomes based on educational attainment across different residential settings. In rural areas, individuals with higher education levels displayed a greater level of overall health. Conversely, in urban areas, the disparities in health outcomes among residents with differing educational backgrounds were relatively narrower.[36] Since urban/rural residency is a covariate of education and income and not a specific study outcome, it was not associated with KAP in the statistical analysis in the present study. A diagnosis of <5 years was associated with higher attitude and practice scores, probably because the AD event was still relatively recent and fresh in the minds of the patients or their relatives, encouraging them to maintain good management. The family members who do not take care of the patients' lives got higher attitude and practice scores, probably because they are more attentive to changes and, therefore, have a better performance at attitude and practice. Still, a web-based survey of 962 respondents reported variable abilities to make lifestyle changes to improve cardiovascular health despite the study population's equal and cost-free access to healthcare.[37] Hence, individualised and targeted education might be the key to improving adherence to postoperative self-management.

The present study showed that 9% of the patients never measure their blood pressure, and 26% never measure their heart rate (or their relatives do not encourage them to do so or perform it for them). Proper blood pressure management is indeed at the core of AD postoperative self-management,[16] but measuring heart rate is equally important to monitor for the development of heart failure or rhythm issues. Education interventions should be designed to inform the patients and their relatives of basic self-management after AD operation, including the importance of monitoring blood pressure and heart rate and taking the medication properly. Of course, the nature of the relationship with the patient (ie, living with the patient or seeing him/her occasionally) will influence the education intervention.

Specific interventions could include interactive educational lectures or online seminars to enhance awareness and improve understanding of the importance of postoperative self-management. Developing personalised management plans tailored to each patient's condition—such as monitoring blood pressure, heart rate and managing medications—can further support recovery. Mobile health applications offering medication reminders, health tracking and educational content can also facilitate better management. Additionally, establishing regular peer support groups can provide a valuable platform for patients and their families to share experiences and strategies, thereby boosting motivation. Culturally adaptive educational materials that address and correct misconceptions based on patients' cultural and socioeconomic backgrounds are also essential. Lastly, telemedicine follow-ups can offer continuous support and monitoring through virtual consultations, ensuring adherence to treatment plans and improving overall outcomes.

In this study, our centre is one of the few centres in China that manages patients with type A AD from various provinces, receiving patients from across the country. Still, the present study had some limitations. The questionnaire was designed by local investigators according to local practice, policies, guidelines and regulations, probably biasing the results. Since the participants were enrolled at a single centre without strict sampling process, the sample size is relatively small, and therefore the representativeness of the data may be limited. Nevertheless, it remains the largest study exploring the KAP of patients with AD. It was a cross-sectional study that provided a picture of KAP at a specific time, which could not determine causality. The results could serve as a baseline to determine the effect of an intervention aiming at improving KAP.[17 18] All

KAP studies are at risk of social desirability bias, in which the participants might be tempted to answer what they should do instead of what they are doing.[38 39] Finally, the other aspects (besides KAP) that may influence disease management and adherence, like risk and time preferences or self-control, were not evaluated.

CONCLUSION

The patients with type A AD and their relatives have poor knowledge, positive attitudes and poor practice of postoperative management. Gaps and factors influencing KAP were identified and could help design interventions.

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Contributors KZ and SG conceptualised and designed the study. CY and JQ were involved in administrative and funding support. KZ and SG were responsible for statistics. KZ, SG, CZ, EX and JS collected the data. KZ, ZW and SG were involved in data analysis and interpretation and drafted the manuscript. All authors read and approved the final manuscript. CY and JQ are the guarantors.

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Competing interests None declared.

Patient and public involvement Patients and/or the public were not involved in the design, conduct, reporting or dissemination plans of this research.

Patient consent for publication Not applicable.

Ethics approval This study involves human participants and was approved by the Ethics Committee of Fuwai Hospital (NO:2022-1745). Participants gave informed consent to participate in the study before taking part.

Provenance and peer review Not commissioned; externally peer reviewed.

Data availability statement All data relevant to the study are included in the article or uploaded as supplementary information. All data generated or analysed during this study are included in this published article.

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