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Experiences and Attitudes of International Travelers with Cardiovascular Disease: A Qualitative Analysis

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Abstract. Cardiovascular disease (CVD) is the leading cause of death among international travelers. It is unknown whether CVD is a barrier to international travel. The purpose of this study was to describe the travel experiences of a cohort of individuals with CVD, to identify their perceived barriers to travel, and to generate recommendations for CVD travelers, medical practitioners, and the travel industry. Semi-structured interviews were conducted with CVD patients who had attended either a regional, structured, multidisciplinary CVD prevention program or a cardiac rehabilitation program. Coding and thematic analysis of the transcripts were supported by NVivo® computer software. Peer debriefing with an independent researcher was undertaken. Demographic and clinical data such as gender, age, and types of cardiovascular condition were also recorded. Twelve patients (eight males), with a mean age of 68 ± 7.58 years, agreed to semi-structured interviews (26–78 minutes duration). The key themes emerging from the interviews included altered travel perception, accessing medical care overseas, issues with medications, medical device concerns at airports, restricted leisure travel activities, and optimal self-care. All interviewees perceived a health benefit to travel and did not regard CVD as a significant barrier to international travel. Certain cardiovascular conditions precipitated more travel anxiety. These findings highlight the unique experiences of CVD patients when engaging in international travel. Cardiovascular disease optimization and responsible travel health behaviors would facilitate medically uneventful overseas travel. The results may inform pretravel health advice given to CVD travelers. Further studies on issues relating to air travel in CVD are warranted.

INTRODUCTION

International tourism has experienced significant growth in recent decades, owing to the convenience in commercial air travel.[1] According to the World Tourism Organization, there were more than 1.3 billion international tourist arrivals in 2017, and this figure is expected to reach 1.8 billion by 2030.[2] Parallel to the growth in international travel is a rise in the incidence and prevalence of cardiovascular disease (CVD), which remains the leading cause of death globally.[3] This also applies to death among international travelers, up to 70% of which may be attributable to CVD based on an analysis of travelers arriving in the United States.[4] Cardiovascular disease is one of the most common preexisting medical conditions among international travelers.[5] It is reasonable to assume that the presence of CVD will likely alter the overall travel experience, given the disease burden imposed on those who are affected.

The effects of air travel on the cardiovascular system have been well documented.[6] Partial pressure of inspired oxygen is reduced in the cabin environment, owing to lower atmospheric pressure. This may trigger decompensation of preexisting CVD, for example, heart failure[7] and coronary heart disease,[8] and exposing passengers to potentially life-threatening inflight cardiac emergencies.[9] Although emergency medical kits are available on most passenger-carrying aircrafts,[10] a commercial aircraft is far from being a well-equipped medical facility. Cardiac-related emergencies (e.g., cardiac arrest, angina, and stroke) are common precipitants for flight diversion and subsequent hospital admission.[11] A study of 148 travelers attending a specialist travel health clinic showed that accessing medical care overseas engendered the greatest concern.[12]

Given the inherent risks of cardiac decompensation abroad, it is imperative for individuals with CVD to seek appropriate pretravel health advice, particularly those with unstable disease. An observational study showed that among 359 travelers with chronic illness including CVD, only 40% sought pretravel advice from their general practitioner.[13] There may be a correlation between self-rated health and the perceived need for pretravel consultation, yet this has not been specifically explored in CVD travelers. Sound knowledge of the relationship between CVD and international travel is essential to guide medical practitioners in providing optimal pretravel advice. Within the individual published European Society of Cardiology guidelines, there are disparities in the level of recommendation, such as vaccination advice for CVD patients, for example.[14]

The travel experiences of CVD travelers may thus serve as a valuable resource for generating more robust travel recommendations. However, the extent to which CVD affects the experiences of international travelers has not been determined. A previous study described the challenges of overseas travel for obese individuals,[15] but these may not be directly applicable to nonobese patients with CVD. Likewise, the travel health considerations for CVD patients have been previously discussed,[16] but whether the known health benefits of travel[17] extend to this cohort of travelers remains undetermined. The primary aim of this study was to ascertain the travel experiences of a cohort of patients with CVD. In addition, this study aimed to identify perceived barriers to travel, to explore potential travel health benefits, and to generate recommendations for CVD travelers and the clinicians caring for and advising them.

MATERIALS AND METHODS

Study design. A qualitative study design, using semi-structured interviews focused on an underpinning phenomenological research paradigm, was used to discern the travel

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experiences of CVD patients. Interview data were collected under the following headings—travel history, travel pattern, pretravel preparation, transportation, travel accommodation, activities, medications and coexisting illnesses, perceived barriers, and solutions. Prompts from a carefully planned interview topic guide were used to elicit greater detail and to expand descriptions of participants' travel experiences. Pilot interviews with the research supervisor and two independent biomedical scientists were undertaken to ensure intelligibility and to militate against excessive diversion from the study aims.

Sample and participants. Participants were recruited using homogeneous purposive sampling.[18] The clinical setting for this study was the Croí Heart and Stroke Center based in Galway in the west of Ireland. A range of CVD prevention programs are delivered at this center by a multidisciplinary team of healthcare professionals. The center hosts the National Institute for Prevention and Cardiovascular Health (www.nipc.ie). The study population comprised adults older than 18 years with various cardiovascular conditions, who had been enrolled in either Croí MyAction, a single-center multidisciplinary CVD risk factor modification program,[19] or Active Heart, a cardiac rehabilitation program, and who had traveled abroad since their cardiovascular condition was first diagnosed. The exclusion criteria for the study included participants who were unable to read and understand the participant information sheet or consent form, participants who were cognitively impaired, and participants who had never traveled overseas.

Data collection. Data were collected through digital audio recording of face-to-face interviews in a private room during the month of April 2019. Interviews ended when the participants perceived they had described their experiences amply. No handwritten notes were taken during or after the interview, and no repeat interviews were required. Only demographic information pertinent to the study was obtained. Interviews were transcribed verbatim on the same day. Individual transcripts were made available to the relevant participant for amendment or feedback.

Data analysis. Interview transcripts underwent thematic analysis to identify underlying themes. NVivo® computer software (QRS International, Melbourne, Australia) was used to support the analysis process. Thematic analysis was performed in line with the principles of Braun and Clarke.[20] The meanings inferred from the collected data were interrogated, which generated 59 initial codes. These were subsequently collated in an iterative process to yield potential themes. Direct quotations were extracted from the transcripts to illustrate the themes and subthemes emerging from the study. To assure anonymity and confidentiality, the quotations were identified by participant number only (e.g., P1 and P2). Peer debriefing with an independent researcher was undertaken.

Ethical considerations. Ethical approval for this study was granted by the Clinical Research Ethics Committee of Galway University Hospitals (reference number C.A. – 2101). Written informed consent to participate in the study was obtained from the participants. The privacy and rights of participants were protected in accordance with the Data Protection Act 2018.[21]

RESULTS

Twelve individuals (eight males), with a mean age of 68 ± 7.58 years, agreed to be interviewed (Table 1). Data saturation was reached after 12 interviews. The interviews ranged in duration from 26 to 78 minutes, with a mean duration of 51 minutes. Travel destinations included the United Kingdom, Spain, Portugal, Italy, France, Germany, Belgium, Switzerland, the United States, Canada, and the United Arab Emirates. Travel frequency ranged from one to seven trips per year, with a mean travel duration of 2 weeks. None of the anticoagulated patients was taking warfarin. Inductive thematic analysis revealed six major themes with multiple subthemes (Tables 2–7).

TABLE 1
Demographic characteristics of study participants

Participant	Age (years)	Gender	Cardiovascular disorder(s)
1	82	Female	AF Acute coronary syndrome (PTCA) Type 2 diabetes mellitus
2	72	Male	Acute coronary syndrome (PTCA)
3	68	Male	Acute coronary syndrome (PTCA) AF
4	77	Female	Acute coronary syndrome (CABG, PTCA) AF
5	58	Male	Permanent pacemaker
6	76	Male	Stroke AF
7	67	Female	Acute coronary syndrome (PTCA)
8	70	Male	Acute coronary syndrome (PTCA)
9	59	Female	Acute coronary syndrome (PTCA) Type 2 diabetes mellitus
10	64	Male	Stroke
11	60	Male	Acute coronary syndrome (CABG) Acute coronary syndrome during overseas travel Stroke
12	65	Male	Acute coronary syndrome (PTCA) Type 2 diabetes mellitus

AF = atrial fibrillation; CABG = coronary artery bypass grafting; PTCA = percutaneous transluminal coronary angioplasty.

TABLE 2
Subthemes and descriptive examples of theme 1—pretravel health preparation

Subtheme	Representative quotations
Early planning of travel arrangements	"*. . .my brother is a last-minute guy. No, I am not. . ..I will know up everything about the air travel options. . ..thinking about it and gathering information well in advance. So I am always prepared.*" (P3)
Travel health insurance	"*It's up to yourself to have insurance cover. And I mean, what you need is a cover to bring you home, somebody to bring your body home, you know.*" (P1)
Preference for smaller luggage	"*The main thing will be to travel light. . .to have a minimum amount of luggage. Even if, even if it means you don't, you can't change your clothes as often as you like, forget about it. It's a lot easier to travel light and to be holding stuff and walking.*" (P6)
Sufficient medications	"*I usually bring meds, you know, to do me another two weeks. So if I am going to be traveling, I make sure I have enough meds for two weeks after my travel.*" (P3)
Travel partner as pillar of support	"*I think the beauty was the wife can know when there's something wrong. And we were. . ..I think it was the second day, and she said you alright now, I said I was, and then I found myself lying, lying on a bench with a whole lot of people around me.*" (P11)
Use of travel agents	"*It can be useful, well when it's your first time, to any particular location, it would be useful to use a travel agent. But once you get to know the handle of it, you set up. . .should be relatively easy.*" (P2)
Travel health information	"*Well I like to be told exactly about my condition, and the ins and outs of it, and the dangers of it. And advised as to how to behave in a way that is more beneficial for your condition.*" (P1)
Appreciation of cardiovascular health	"*I won't go on travel if I don't feel well. Because I know people who have gone on travel and died on the plane. So I'm unlikely to go if there's any hint of the risks of me not being well.*" (P3)
Lack of perceived need to visit specialist travel clinic	"*For travel? No no. I don't have to. I don't have to. I'm not going anywhere where they need it.*" (P4)
Convenience of special medication baggage	"*. . .when I travel with my own kind of erm, in cabin case I use to put my meds into, they will always have a look. Whereas this time, I went with a bag that was specifically for medications, and they have some sort of a label on it, and nobody looked at all.*" (P9)
Nitrate spray	"*I will take that (GTN spray) in my bag...just for safety sake in case on the plane I might get a bit of tightness.*" (P7)
Walking stick to aid mobility	"*If I was on a holiday or somewhere, I always walk with a stick like you know. . .because it prevents the fall. If you are going downstairs and you have a stick, well you have less chance like you know.*" (P6)
Wearable smartwatch to monitor health	"*I always wear it. Yeah. But erm, any facility like that, I think anyone that has a (heart) problem, should have it.*" (P8)

Theme 1: Pretravel health preparation. Participants described their routine pretravel preparation for an international trip. Many had medications at the top of their travel checklist and brought more than the amount required for the travel duration (Table 2). One participant packed double the normal amount in separate baggage. Some opted for a specially labeled medication bag that helped to circumvent rigorous security inspection. This practice alleviated potential stress at the airport security. Some participants recalled missing several medication doses overseas despite reporting self-perceived adherence.

Most participants acknowledged the necessity of purchasing travel insurance, with a minority regarding this as unnecessary if already covered by basic health insurance. Age presented a barrier to obtaining insurance cover. Some participants highlighted the importance of obtaining medical repatriation insurance. More than half of the participants preferred to have their travel arrangements booked online, owing to better flexibility. Travel agents, although uncommonly utilized, were considered to be helpful for travel destinations that might lead to more planning uncertainty. The majority did not visit their general practitioner or cardiologist

TABLE 3
Subthemes and descriptive examples of theme 2—transportation and transit

Subtheme	Representative quotations
Medical device concerns at airport security	"*. . ..the security guy, he's not thinking of my health. . .This one, of going through this new, 'Star Trek' machine. . .the security guy can say oh yes it's fine, but it may not be. I was worried.*" (P5)
Airport wheelchair assistance	"*A wheelchair at the airport to get to the gate. And I would advise anybody, it's the best way of doing. . ..You don't queue up for going through because people with wheelchair they go another way.*" (P12)
Avoidance of early morning or late-night travels	"*So I would suggest that if you have heart conditions that you, never put yourself in a position where you have to be traveling early in the morning.*" (P3)
Airplane aisle seats	"*And I'd advise people to you know, it's not necessary, but if you could get within maybe two seats of where there's a toilet, you won't have to do too much walking.*" (P12)
Inability to occupy emergency rows	"*Even the emergency row, they won't let someone like me sit there anyway. They won't allow older people to sit in those seats.*" (P2)
Medications in hand luggage	"*I'm just trying to think. . .I think the medicines go on, on our carry hand luggage. It's safer, rather than in the (hold), stuff can disappear out.*" (P7)
Infections after air travel	"*The only thing in the plane, the air conditioning kind of. . .the last time I came back, I got a cold. I think it was the air condition you know. Picked up something I didn't need to.*" (P8)
Preference for cruise ship travel	"*What I found about the last air travel was there's. . ..people say it's faster than the boat. . .the other way of traveling is much more relaxing for me.*" (P6)

TABLE 4
Subthemes and descriptive examples of theme 3—travel experiences and activities

Subtheme	Representative quotations
Heat and cold intolerance	"*. . .I find it challenging to cope with hot weather. . .I was back on a visit to Texas, in the summer time, it nearly killed me. You know, just the heat, erm, too hot.*" (P3)
Avoidance of strenuous activities and risky behaviors	"*. . ..wouldn't be advisable to go and do any strenuous activities they have never done before like you know. Silly things like that. Put themselves in any danger.*" (P4)
Pursuit of aquatic activities	"*I used to be jet skiing, well I will be still doing now in the summer when (abroad), great for balance. Uneven surface, they keep your posture and your balance, in tune all the time.*" (P8)
High-altitude tourism	"*. . ..you move along the route, and you stay as you go. Where, when I went to places like Peru, we were trekking and staying erm, in the mountains.*" (P5)
Preference for hotels	"*So we have stayed in Airbnb®, that wasn't great. . ..I was carrying the suitcases, so the steps....the accommodation was very tight. When you were traveling, you need to be able to have room to spread around.*" (P3)
Quiet rooms for better sleep quality	"*Well when I am making the decision, I just look for a quiet room. . ..so as not to be disturbed at night, by the street or by people making noise.*" (P5)
Awareness of responsible food consumption	"*Erm, there's so much. . .you can eat as much as you like, and drink as much as you like. But you have to be controlled you see.*" (P6)
Missed medication doses	"*On Saturday, I didn't have. . .I left my meds behind. So I missed those two days. But erm, the minute I got back on Sunday, I took my meds. So I missed a day and a half.*" (P2)

before embarking on overseas travel. Those who did, however, found the advice provided to be reassuring. None of the participants sought pretravel advice from specialist travel health clinics.

Appreciation of self-management was a prominent feature of these semi-structured interviews. Participants in this study expressed personal responsibility for ensuring that their CVD was well controlled and stable before traveling abroad. Several individuals canceled their trips the day before departure, owing to personal illness. Most participants preferred to travel with their partner or in a group. Large luggage was generally not favored by travelers, and some deliberately chose a travel destination with warmer climate where less clothing would be required. One participant carried nitrate spray with him for all of his overseas trips. Another interviewee encouraged the use of smartwatches to monitor changes in cardiovascular parameters closely (e.g., heart rate and blood pressure). Walking sticks were considered beneficial by stroke-affected travelers, particularly if the trip was anticipated to involve a considerable amount of walking.

Theme 2: Transportation and transit. Table 3 summarizes the experiences and reflections of participants in relation to air travel. Some participants reported routinely requesting airport wheelchair assistance, attributing this to not only old age but also the perceived convenience of this service for their condition. The majority regarded airport navigation as manageable, despite an aversion to protracted airport stays incurred by flight delays, which left them physically exhausted.

Travelers with cardiac devices (e.g., pacemaker and loop recorder) recalled no overt difficulties in passing through airport security. Letters from their physician and device identification cards helped to avoid potential interrogation. The participant with a pacemaker preferred the fast track check-in option to enhance convenience at the airport. No prior communication with the airport authority was required for these individuals. Concerns were raised, however, in relation to the performance of pacemakers in body scanners. To reduce travel-related stress, some participants opted for additional airport hotel stays either before departure or on arrival, whenever they had an early or late flight to catch. Most travelers carried their medications in carry-on hand luggage for safety reasons. One CVD patient with an insulin pump found her air travel experiences challenging, owing to variation in the recognition of her pump at different airports worldwide.

There was preference for airplane aisle seats among study participants, mainly for ease of toilet access. A minority frequently paid for seats in the first six rows to facilitate airplane boarding. Several participants expressed their inability to occupy emergency exit seats, owing to old age. Most participants found the flight attendants to be accommodating for passengers with CVD if assistance was ever required. Some believed that wearing compression stockings on the airplane was necessary. One participant with stroke preferred cruise ship travel and considered this option to be less stressful and more feasible when traveling alone. No inflight medical events were mentioned. Some interviewees reported frequent flu-like

TABLE 5
Subthemes and descriptive examples of theme 4—accessing healthcare service abroad

Subtheme	Representative quotations
Challenges in obtaining medications	"*Oh there was, I had problems because I had no erm no prescription. All I had was an empty carton of what I was taking.*" (P12)
Quality of medical care received	"*So I found it very good to the extent like you know that erm, they had all the notes, everything ready and had what they found and what wasn't found.*" (P11)
Perceived language barrier to communication	"*The thing is I didn't understand French, and neither did my wife. So we were trying to get information and the nurses actually weren't very pleasant.*" (P11)
Insight into health system abroad	"*. . ..they should have some idea (of) the medical system in the other country like you know. . .you wanna have some kind of idea.*" (P6)
Concerns about medical evacuation	"*I mean the worry at that time now was. . .get me to fly back, because I was three days in the hospital now.*" (P11)

TABLE 6
Subthemes and descriptive examples of theme 5—travel health benefits

Subtheme	Representative quotations
Freedom from medical commitments	"*I think we need that because when you are constantly, constantly going into hospitals, appointments, appointments, appointments. . .It's just lovely to get away from the country even, just to get away and get a break from it all.*" (P9)
Opportunity to strengthen existing friendships	"*We did a bus trip around Sicily, there were about 35 or 40 of us. So we flew out, on a bus, traveling around. . .absolute fantastic. Absolutely fabulous.*" (P3)
Mental health benefits	"*Well, I don't know about physical health, but certainly mental. . ..Mental health, absolutely yeah, beneficial.*" (P2)
Capacity to broaden perspectives	"*And it helped to give me a different perspective on the world. You were. . .if you didn't develop the ability to see things from someone else's point of view, there was something seriously wrong with you.*" (P3)
Historical sightseeing	"*You know, lovely time, the. . .just seeing all the old artifacts, the temples, and ruins from roman times. It was stunning.*" (P3)
Exposure to other languages and cultures	"*. . .I like hearing different languages, I like the sounds, I like the rhythms of different places. And erm, I particularly like to hear the natives speak their own language and then after a while, began to identify the. . . what's happening, by the sounds.*" (P3)
Opportunity to increase physical activity	"*Oh I will, I walk more when I be abroad. Yeah I would. . ..walk every morning before breakfast, and I will go for cycle every afternoon.*" (P7)
Benefits of sun for arthritis	"*Oh it was beautiful, and the heat helps the arthritic pain. They just go away. Arthritic pain dissolves in the heat. . ..The heat helps, greatly, greatly.*" (P1)

symptoms whenever they traveled by air, ascribing these to the airplane air conditioning.

Theme 3: Travel experiences and activities. Participants in this study described the diversity in recreational activities pursued abroad. Sea swimming was a common activity in this group of travelers. Several individuals engaged in adventure water sports, stating the physical health benefits associated with water skiing, for example (Table 4). Some enjoyed hill walking, with one expressing a strong interest in mountain climbing. Travelers who preferred a less physically demanding trip were reluctant to participate in extreme leisure activities, owing to their heart condition. One participant had several international trips annually dedicated solely to watching live football matches. The importance of pursuing an active lifestyle overseas, regardless of the physical activity level, was deemed to be crucial for maximizing travel experiences:

> *"But you know, you can't do touristy things without a certain amount of walking." (P3)*

Most participants alluded to the better climate abroad to drive their motivation for traveling overseas. Some individuals expressed difficulties in coping with extreme heat or cold, describing heat intolerance, owing to their age. There was perceived importance in maintaining a well-controlled diet at the travel destination. Participants were able to resist the temptation to overindulge despite the unlimited food availability on cruise ships, for example. One participant refrained from consuming any alcohol when abroad:

> *"I think that's the big one, with alcohol. I do, I think alcohol would not be good for your heart." (P1)*

More than half of the interviewees preferred staying in hotels; others opted for Airbnb® accommodation (Airbnb, Inc., San Francisco, CA). Cheaper accommodation costs were a common reason cited for the latter option. Those who favored hotels perceived this alternative to be more accommodating to their condition. The majority had no specific preferences when selecting hotel rooms, although some tended to request rooms on the lowest available floor. There was no absolute dependence on hotel elevators as several participants had no issues using stairs when the elevators were under repair. No fire safety issues were raised.

Theme 4: Accessing healthcare services abroad. Participants in this study reflected on the experiences of obtaining

TABLE 7
Subthemes and descriptive examples of theme 6—perceived barriers to travel

Subtheme	Representative quotations
Psychological barriers to travel	"*I was anxious beforehand about how I would go, given that I wasn't as strong as I used to be.*" (P3)
Difficulty obtaining travel health insurance	"*I would insure myself. Yeah. And now they won't give, very few people will give you when you are over 80. . .They don't want to give it to you at that age. You are too big a risk.*" (P1)
Anxiety as lone travelers	"*It's a little bit inhibiting in the sense that erm, you know, if I was to go on my own to. . ..I'll be a little bit nervous. A little bit nervous. You know you are on your own. You didn't feel well, not just your heart, but anything, you know. If you are on your own, what would you do, yeah.*" (P4)
Physical limitations after cardiovascular event overseas	"*It's a lot different actually. . .it's still not the same, it's still slow no matter what. I mean there was a time, what I do is I be walking in front of the wife, and now I am walking behind.*" (P11)
Altered airport experiences	"*The security checks, yeah. So obviously, that was a big change in that (before) I just went through security like everybody else. But now, now I have to say hang on.*" (P5)
Avoidance of long-haul flights	"*I would worry about a long flight now. I would, I hesitate about that because of the condition. Yeah. A four-hour flight would be enough.*" (P1)
Fear of medical event abroad	"*There's always the nagging fear in the background, oh I might not be well during the travel. I might get an atrial fibrillation or event.*" (P3)

medications and receiving medical care abroad. The majority did not experience any medical events or deterioration in their cardiovascular condition overseas. An issue that disturbed some participants from a medical perspective was mild gastrointestinal discomfort that appeared to resolve spontaneously without long-term sequelae. Several participants recalled the need for purchasing medications at the travel destination, which tended to be more costly. This proved to be challenging for those without prescription (Table 5). One participant suffered an acute myocardial infarction when traveling abroad and required emergency hospitalization. Despite minor communication difficulties encountered with the healthcare providers, the quality of care received was deemed satisfactory. The importance of travel insurance was emphasized by this participant as it helped to reduce the medical expenses incurred. The prolonged in-hospital stay raised concerns of ensuing medical evacuation if the hospitalization were to extend further.

Theme 5: Travel health benefits. Most of the participants appreciated the potential benefits of international travel to their health. Mental health benefits associated with temporary escape from medical appointments were acknowledged, in addition to the pleasure of group camaraderie (Table 6). Some participants alluded to the opportunity afforded to them by travel to flee the country that periodically reminded them of their CVD. Participants enjoyed meeting new people who were not apprised of their underlying cardiovascular condition. This social aspect of travel broadened their language and cultural horizons. Travel provided an opportunity to increase their level of physical activity. There was also a recognition of the perceived physical benefits of sun exposure for individuals with arthritis, which was a common comorbidity among study participants.

Theme 6: Perceived barriers to travel. The participants in this study reflected on the issues and worries associated with international travel. Most of this group experienced varying degrees of apprehension before embarking on overseas travel (Table 7). The presence of CVD precluded some individuals from traveling to remote places, necessitating mindful selection of travel destinations. Some reported that the physical limitations stemming from their cardiovascular condition prolonged the time required for completing airport formalities. Most participants did not feel entirely comfortable in pursuing solo travel. The interviewee who had a cardiovascular event abroad expressed his unwillingness to travel again:

"I didn't bother renewing my passport. As I said I wouldn't be traveling anymore." (P11)

Despite the pretravel anxiety, most participants accomplished their travel plans without experiencing major issues, apart from travel fatigue. Participants' perception of travel with CVD was ameliorated after completing their trips:

"I thought it would be. Eh, when I had the problem, I thought that it would be a major barrier. Now after (travel), it's not." (P3)

The majority reflected on the importance of stress-free travel to achieve optimal travel experiences while ensuring that the travel pace aligned well with their physical capability (e.g., took frequent breaks when walking uphill). Having some insight into the healthcare system abroad, in addition to purchasing travel insurance, provided reassurance for international travel. Several cardiovascular conditions, such as stroke and atrial fibrillation (AF), generated more concerns among the study participants:

"And then, as soon as it's time to board, you have all these, you have to rush, there's a bit of rushing to get to. . .pass security and all this kind of stuff. . .People with strokes would find it more daunting to be able to find these things in their pockets." (P6)

"Oh, the one that causes me more anxiety would be the atrial fibrillation. Because whenever the atrial fibrillation has happened, it happens unannounced. So I have no idea." (P3)

DISCUSSION

This is the first study to describe the experiences and attitudes of individuals with various cardiovascular conditions who have traveled to other countries. As the global burden of CVD escalates,[22] it is essential to ensure that those with CVD are facilitated in traveling uneventfully.

Medications are essential for maintaining cardiovascular health; however, certain medication doses might be missed, owing to inflexible travel itinerary or inattention. Medication nonadherence is a well-recognized issue for patients with CVD, in particular among those with polypharmacy such as the elderly.[23] Travelers without prescription are vulnerable to the hazard of obtaining substandard or counterfeit medications overseas, primarily from non-pharmacy sources, owing to lower cost and perceived convenience.[24] Cardiovascular disease patients intending to travel abroad should be reminded to bring their prescription with them to pretravel consultations.

The use of non–vitamin K antagonist oral anticoagulants (NOACs) (e.g., rivaroxaban and dabigatran) was favored by study participants with AF as these agents avoided the need for international normalized ratio monitoring abroad. This observed patients' preference is consistent with the increasing popularity of NOACs among AF patients globally.[25] Given their favorable risk-benefit profile and the possible improvement in adherence rate compared to warfarin, NOACs may be a better candidate for eligible travelers with nonvalvular AF and normal kidney function who require anticoagulation for stroke prevention.

Certain vaccinations are recommended for patients with CVD[16] and may warrant pretravel consultation. Hepatitis B vaccine mitigates the risk of nosocomial transmission if accessing rudimentary health services abroad.[16] Cardiovascular disease patients, in particular those older than 65 years, would benefit from pneumococcal vaccination.[26] There were accounts of participation in crowd-based activities overseas as well as cold symptoms aboard commercial aircrafts, both of which have been associated with influenza transmission and could be targeted with pretravel influenza vaccination.[27] This study did not specifically explore vaccination adherence, which has been shown to be suboptimal among international travelers.[28]

Cardiac emergencies resulting from decompensation of preexisting CVD may necessitate hospital admission overseas. This could impose additional health burden on the travelers involved, given the inherent challenges in ensuring that high-quality medical care is received overseas without access to their medical history or records. This quality concern also pertains to those who pursue medical tourism such as cardiac surgery,[29] cosmetic surgery,[30] and stem cell therapy.[31] Language barriers may hinder effective communication, further adding complexity to the delivery of optimal care. A detailed travel history,[32] in addition to description of overseas medical events, should be obtained from returned CVD travelers.

There was a strong preference for organizing travel plans through online booking. Although a convenient platform, travel health information pertinent to CVD travelers that is available on commercial travel websites may not be sufficient.[33] Similar issues are evident among travel agents. A study of 24 travel agents showed that up to 60% of traveling clients frequently raised questions regarding destination health risks; however, only a minority of travel agents were confident about the advice provided.[34] Improved collaboration between the travel industry and medical practitioners could benefit prospective CVD travelers.

The importance of travel medical insurance may not always be appreciated by the traveling public.[35] Travelers with CVD should ideally insure themselves against medical emergencies abroad. For those who may be uninsurable owing to advancing age, appropriate pretravel advice should be offered to optimize their cardiovascular health overseas.[36] Most diagnoses requiring aeromedical evacuation are for femoral neck fracture (15%), stroke (14%), and myocardial infarction (8%), all of which occur more frequently in older CVD patients.[37] Information on emergency medical assistance services should also be provided, as up to 30% of international travelers may not be aware of this valuable resource abroad.[38]

It is generally recommended that stable patients should travel at least 2 weeks after their cardiovascular event.[8] Nitrate spray and a copy of a recent ECG should be carried on the airplane, and onboard wheelchair services should be made available for those requiring mobility support (e.g., stroke-affected travelers). Notwithstanding individual preferences, airplane aisle seating may facilitate better passenger access if medical assistance is required. Incidence of inflight deep vein thrombosis, although relatively low, may warrant use of compression stockings in high-risk CVD patients.[39] Emergency medical kits[10] and onboard supplemental oxygen are essential, the latter of which may also benefit travelers with heart failure.[40] Although there were no heart failure participants in this study, a previous study explored the air travel experiences of chronic heart failure patients.[7] Cardiac-related emergencies on cruise ships (e.g., cardiac arrest and myocardial infarction) should not be overlooked, as these conditions frequently entail emergency air evacuation.[41] Cruise ship physician and medical facilities are available on most commercial cruise ships, and this information should be included in the pretravel advice for prospective cruise ship travelers with CVD.

Navigating airports could be physically demanding for those with reduced mobility such as stroke-affected and elderly patients. Wheelchairs would benefit these individuals, including the facilitation of better airport evacuation during emergencies[42]; hence, the airport authority should ensure the consistent availability of this resource. Modern implanted cardiac devices are well shielded from both metal detector gates and handheld metal detectors.[43,44] A pat down manual search, however, was frequently the option offered to and preferred by study participants with these devices, owing to inherent safety concerns. The suitability of these devices in full-body scanners remains controversial. A recent study of 300 patients with cardiac devices found no evidence of electromagnetic interference or device malfunction with the full-body scanner.[45]

In addition to the lack of perceived physical difficulties in evacuating safely in a fire, the study participants did not voice concerns about hotel fire safety. Preference for quiet hotel rooms, ideally on a lower floor, was evident in some travelers. The latter practice, although primarily related to personal preference, is supported by previously tabulated fire safety advice for hotel guests.[46] Rooms closer to the ground level would better facilitate hotel egress for those with mobility restrictions when the elevator service is interrupted by a fire. Likewise, quiet rooms improve sleep quality, an important determinant of cardiovascular health. Notably, first aid knowledge among hotel staff[47] and availability of first aid kits in Airbnb® venues[48] have been shown to be inadequate in previous studies and warrant tighter regulation. Similarly, recognition of the universal sign for automated external defibrillators among international travelers is poor based on an airport survey.[49]

Participants in this study did not feel entirely restricted when traveling abroad, demonstrated by their pursuit of high-altitude activities as well as adventure water sports. These activities, however, are not without inherent cardiovascular risks, owing to excessive physical demands and may warrant appropriate pretravel health advice. They could also precipitate accidental injury or trauma, further imposing undue stress on cardiovascular health. There is a recognized risk of cardiac arrhythmias associated with cold water immersion,[50] which may render diving inappropriate for high-risk CVD patients. In contrast to the wealth of guidelines on high-altitude tourism and CVD,[51] recommendations for aquatic activities in this regard are lacking and warrant further research. Pretravel advice on protective measures to mitigate the risk of heat-related illness and cold-induced myocardial ischemia should be provided to CVD travelers who are more susceptible to the effects of thermal extremes.

The perceived barriers to international travel were predominantly related to diminished physical endurance, owing to CVD and, to a lesser extent, advancing age. Despite these anticipated barriers and the anxiety around travel health outcomes, it was apparent that timely pretravel preparation alleviated most of the travelers' concerns. Self-awareness of cardiovascular health reduced the risk of CVD decompensation overseas. A well-prepared, diligent CVD traveler may embrace the physical and mental health benefits afforded by international travel,[52] as demonstrated in this study. Most participants had been accompanied during their overseas travel and found this travel support reassuring. A previous study showed that up to 80% of people with medical conditions would not travel alone.[5] Patients' partners may also impact on their travel health behaviors, owing to shared lifestyles. Whether the presence of travel partners reduces the incidence of medical events abroad, however, is not known and should be explored further.

AF and stroke provoked higher levels of anxiety among participants in this study. The former related to the fear of disease decompensation overseas (e.g., new heart failure symptoms owing to AF with rapid ventricular rate requiring hospitalization). Stroke impacted on patients' physical ability to perform travel-related tasks, and this was largely dependent on disease severity. Despite this, a comprehensive recommendation for travelers with stroke is not available. There was recognition of the need for aeromedical evacuation and medical repatriation, predominantly concerning acute myocardial infarction and stroke. A strong evidence base to guide these services for respective travelers, however, is lacking and warrants further research. There is increasing popularity of monitoring cardiovascular health using electronic devices.[53] This phenomenon may signify the potential utility of health technology for remote patient–physician communication, such as telemedicine. It remains to be seen what adaptations will have to be made to enhance the feasibility of this strategy for CVD travelers.

The semi-structured interviews conducted in this study, although a rice source of patient-generated data, are limited by volunteer bias, recall bias, and potential researcher bias. The study involved an educated group of CVD patients, all of whom had attended prevention and rehabilitation programs. They may not be representative of all CVD patients, owing to improved cardiovascular risk profile and heightened awareness of health risks. Despite this, there was excellent agreement between two independent individuals on emergent themes and subthemes.

Extension of this single-center study to multiple, international centers would be beneficial. Capturing the travel experiences of patients with other cardiac conditions (e.g., heart failure and congenital heart disease) would add value. Inclusion of CVD patients of a wider age range and socioeconomic background would help to enrich the qualitative data obtained. Triangulation through the convergence of study findings with a quantitative study would improve reliability and generalizability. The essence of travel-related health information is to ultimately prevent cardiac decompensation abroad, thereby avoiding subsequent cardiovascular deaths, yet this important piece of information is not included in the available CVD prevention guidelines.[54,55] Incorporating this information into future guidelines would be a worthwhile initiative toward a more holistic approach to CVD prevention.

CONCLUSION

This study highlights the unique travel experiences of patients with various cardiovascular conditions. The anxiety and potential barriers to travel correlate with perceived CVD stability and severity. Adequate pretravel preparation and optimal self-care are imperative to ensure enjoyable and medically uneventful overseas travel. Potential issues facing CVD travelers should be addressed in the pretravel consultation. Future research should focus on improving standardization of the information available regarding air travel and evaluation of the supportive measures offered by the travel industry to maximize the health benefits of travel for individuals with CVD.

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