Understanding Heart Health Knowledge in Newly Diagnosed Cardiac Patients in Aotearoa New Zealand: Insights from a Mixed Methods Study

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CSANZ New Zealand Annual Scientific Meeting

Energy Events Centre, Rotorua | 23-25 May 2025

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Disclosures

Disclosures / Conflicts of Interest

- This research was supported by University of Canterbury, as part of a PhD research thesis.

- I have no financial relationships with commercial entities related to this presentation.

- I have no conflicts of interest to declare.

To Cover today

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How this research emerged

Exploring the heart health knowledge among newly diagnosed cardiac patients in Aotearoa New Zealand: A convergent mixed methods inquiry

Research Question

➢ What do newly diagnosed patients understand about heart health following their first engagement with acute cardiac hospital services?

➢ What are cardiac patients and health care professionals' understandings of patients' levels of heart health knowledge.

Research Objectives

➢ To assess what newly diagnosed patients understand about their cardiac health, following engagement with acute cardiac hospital services, utilising a previously validated and verified Coronary Artery Disease Education Questionnaire II (CADE-QII).

➢ To describe the patient demographics that may influence heart health knowledge scores.

➢ To investigate what patients and cardiac health care professionals understand patients know after engagement with acute cardiac hospital services.

Exploring the heart health knowledge among newly diagnosed cardiac patients in Aotearoa New Zealand: A convergent mixed methods inquiry

Today's presentation is going to focus on the patient participants, staff perceptions and the meaning when the combined data was triangulated, and analysis will be presented at CSANZ - Brisbane

Methodological snap shot

Study Design:
Fixed convergent mixed methods design.

Two Phases:

Phase 1 – Qualitative focus groups (Designed around the CADE-QII domains of knowledge)

Phase 2 –Quantitative survey (Using previously verified and validated survey tool CADE-QII)

Participants:

Phase 1: Newly diagnosed cardiac patients (n = 7)

Phase 2: Survey respondents (n = 136)

Data Collection Sites:

Focus Groups:
Christchurch New Zealand

Survey: (DHBs at the time)

- Southern
- Canterbury
- Capital and Coast
- Counties Manukau
- Waitemata (North Shore and Waitakere)

More about the participants

Focus Groups

- Aged 30+
- Provided informed consent
- Received hospital cardiac education (recent or >10 years ago)
- Diagnosed with:
  - ACS (STEMI, NSTEMI, unstable angina)
  - CABG or PCI
  - ICD or CRT (non-ACS/HF)
  - Exertional angina
  - Valve replacement (non-ACS/HF)
- Able to participate in English-language discussion or te reo Māori

Survey (same as above, with the following additions)

- Implied consent completing the survey
- Able to complete survey in English (pilot phase)
- Translated versions available post-pilot: Samoan, Tongan, Hindi, Tagalog, Mandarin, Te Reo
- Self-identified literacy in one of the above languages (national rollout)

Survey Coronary Artery Disease Education Questionnaire – Version II.

- ## CADE-QII scores calculated against demographic data

Component	Details
Purpose	Assesses knowledge of coronary artery disease (CAD)
Structure	31 multiple-choice questions
Response Options	- Correct (3 points) - Partially correct (1 point) - Incorrect or "I don't know" (0 points)
Maximum Score	93 points
Domains Assessed	1. **Medical Condition** (7 items): CAD, angina, heart attack causes, medications 2. **Risk Factors** (5 items): Cholesterol, BP, diabetes prevention 3. **Exercise** (7 items): Safe post-cardiac activity, monitoring, adjustments 4. **Nutrition** (7 items): Fats, fibre, sodium, food labels, healthy choices 5. **Psychosocial Risk** (5 items): Stress impact, triggers, and management
Scoring Use	Provides domain-specific and total knowledge scores to identify education needs and inform interventions

Aspect	Details
Participants	136 respondents
Demographic Data	Ethnicity Employment Gender Age Education level Household income Residence Hospital used
Health Background and Educational Experience	Time since hospital education Education hours received Heart procedures Comorbidities Smoking history

Overall New Zealand CADE-QII score

CADE-QII score of 63.04 ± 13.38 and a mean group percentage of 67.7%.

Country/Study Location	Mean Score (out of)	Mean %	Standard Deviation	Notable Notes
China	45.74 / 84	54.4%	±18.94	Lowest score overall
Brazil	53 / 81	62%	±14	Second-lowest
USA (Texas)	58.04 / ?	62%	±15.89	Similar to Brazil
Aotearoa NZ	63.04 / 93	67.7%	±13.38	Mid-range score
Canada (2015)	64.2 / 93	69%	±18.1	Comparable to NZ
Canada (2015 - control)	64.72 / 93	70%	±17.35	Pre-rehab group
Canada (2021)	68.48 / 93	74%	±14.31	Highest score

Knowledge Classification Based on CADE-QII Scores

Knowledge Level	CADE-QII Score Range	Percentage Range	Participant Count
Great	83–93	90–100%	3
Good	65–82	70–89%	59
Acceptable	46–64	50–69%	59
Poor	28–45	30–49%	12
Insufficient	< 28	< 30%	3

Highest Education

Highest Level of Education
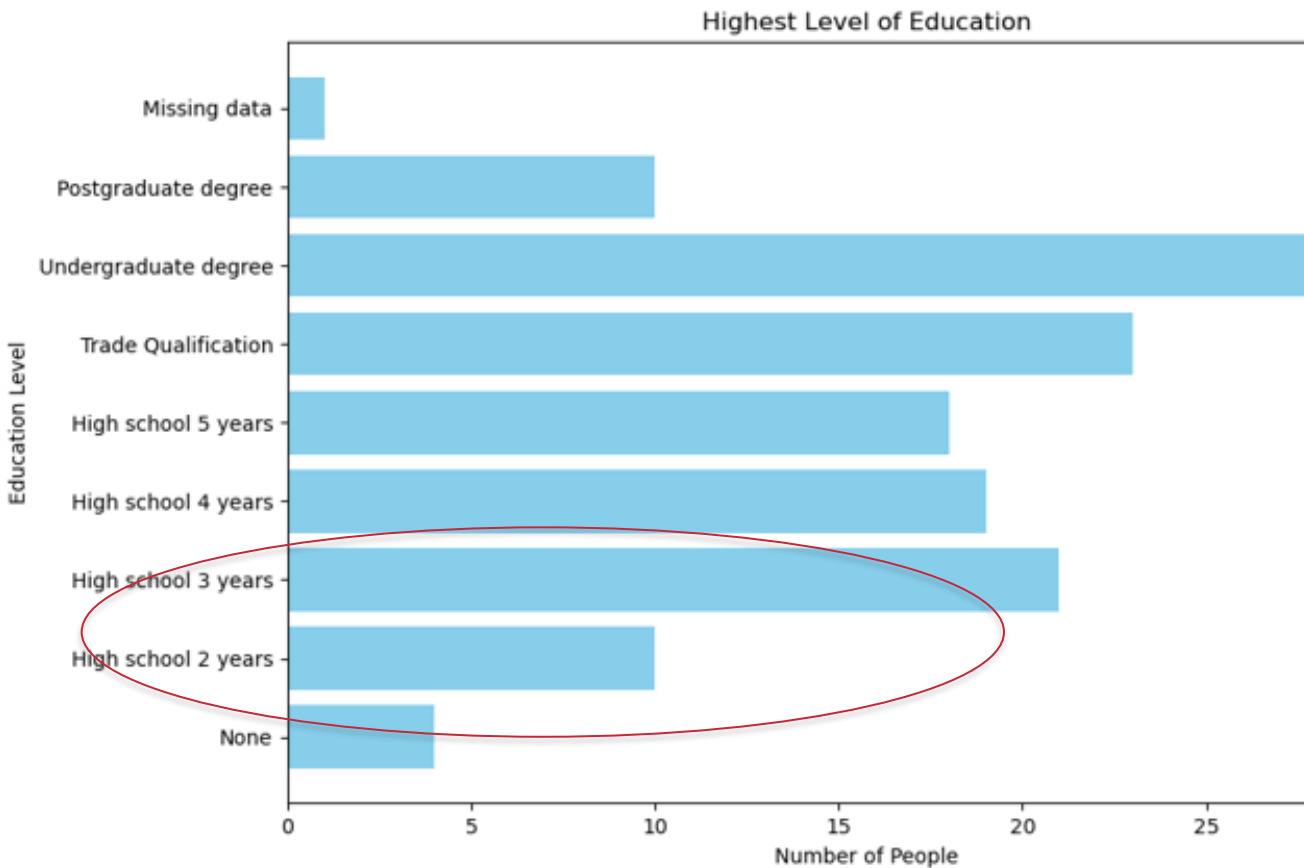
Variable	N(%)	Score	T/F	df	P-value/Sig
Educational level			2.084	7	0.050
Post graduate degree	10(7.4)	65.60±18.82			
Undergraduate degree	30(22.1)	68.17±12.29			
Trade Qualification	23(16.9)	64.00±13.90			
High school 5 years	18(13.2)	66.06±11.70			
High school 4 years	19(14.0)	60.74±15.04			
High school 3 years	21(15.4)	57.90±8.43			
High school 2 years	10(7.4)	55.60±14.38			
None	4(2.9)	55.25±7.36			
Post hoc Multiple comparison – significant findings					
High school 2 years compared with high school 5 years					0.045
High school 2 years compared with Undergraduate degree					0.009
High school 3 years compared with Undergraduate degree					0.007

Smoking

Distribution of Smoking Status
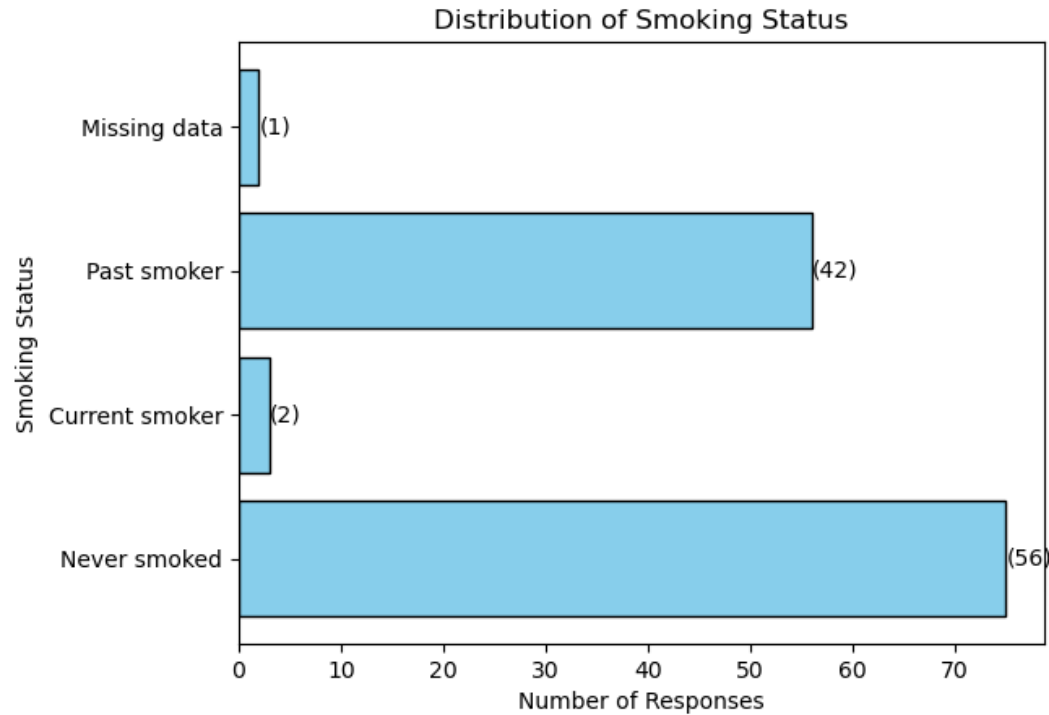
Variable	N(%)	Score	T/F	df	P-value/Sig
Smoking			2.933	2	0.057
Past smoker	56(41.2)	60.63±13.75			
Current smoker – any amount	3(2.2)	52.67±19.14			
Never smoked	75(55.1)	65.31±12.71			
Post hoc Multiple comparison – significant findings					
Never smoked compared to Past smoker					0.048

Employment

Employment Status (bar chart)
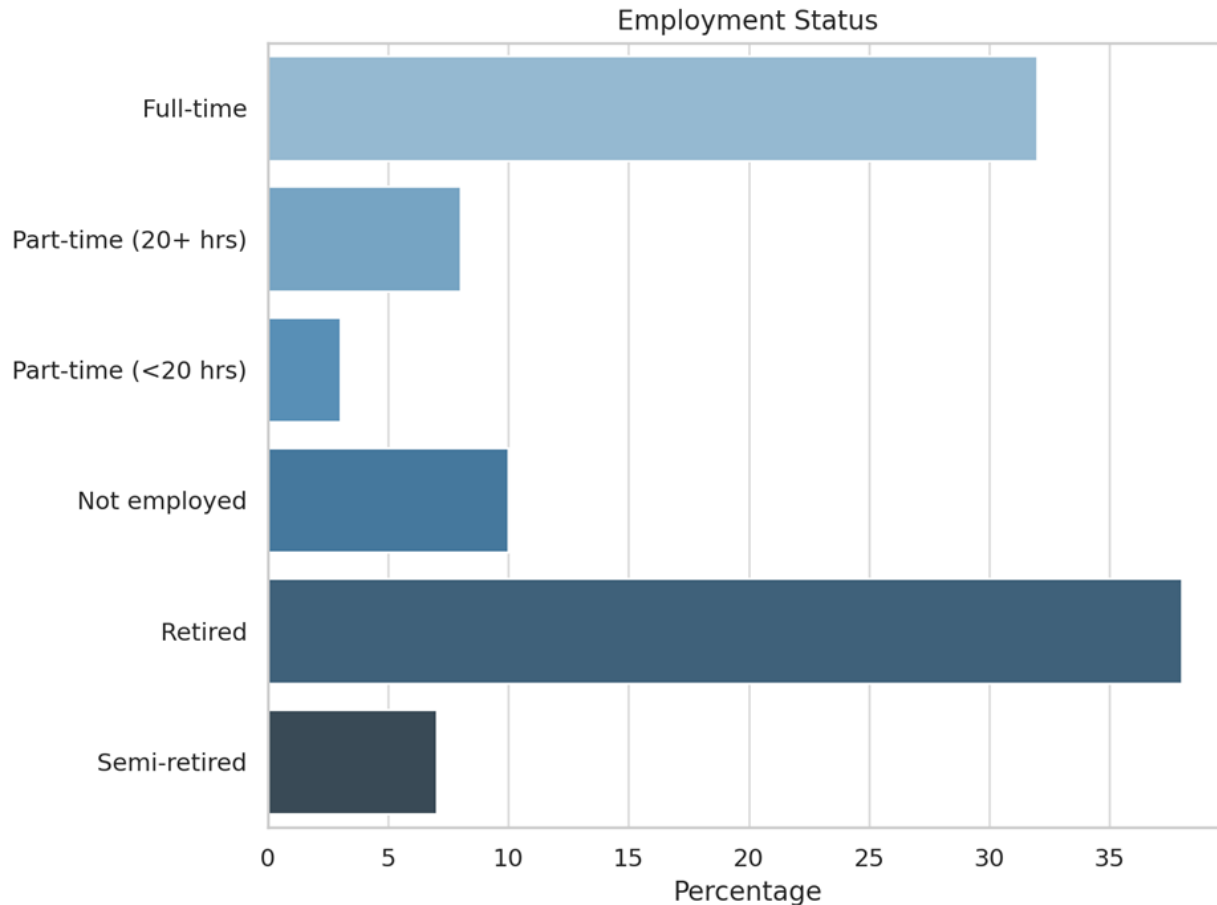
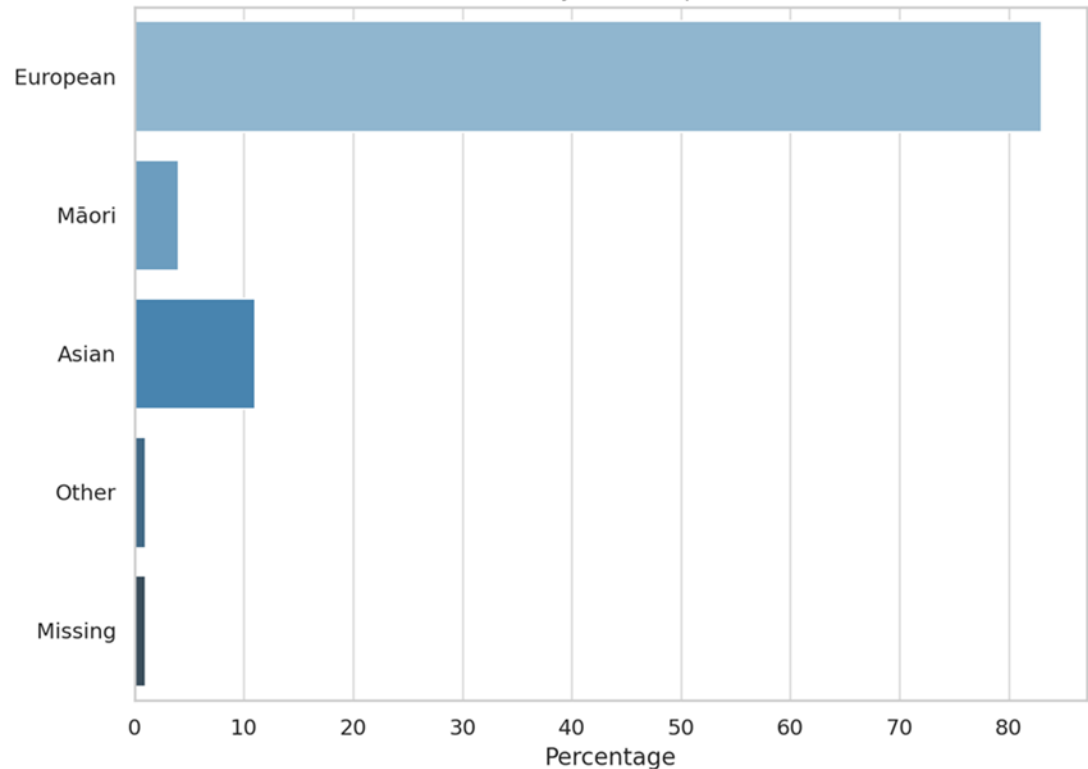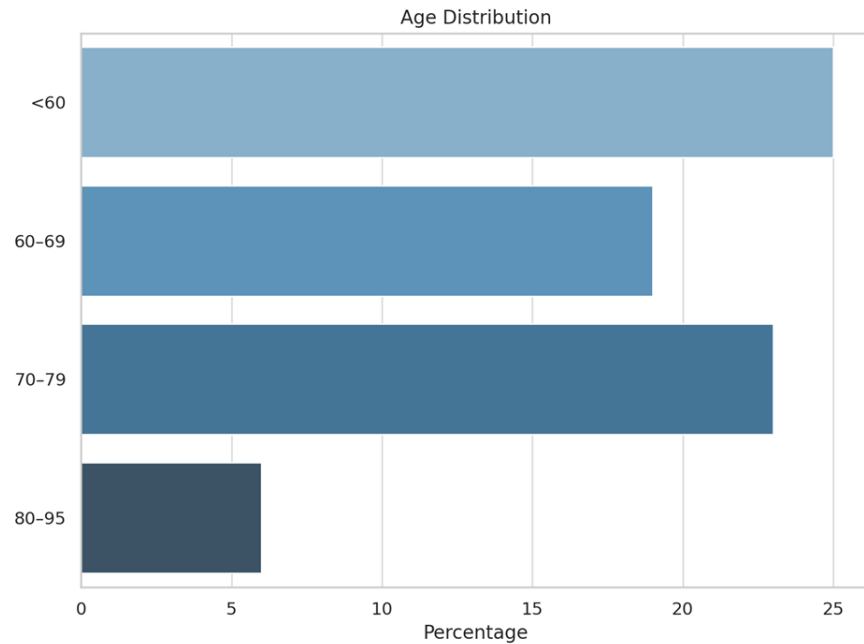| Variable	N(%)	Score	T/F	df	P-value/Sig
Employment status			2.262	5	0.052
Employed Fulltime	44(32.4)	65.27±13.37			
Employed part-time 20+ hours per week	11(8.1)	68.64±12.16			
Employed part-time or casual less than 20 hours per week	4(2.9)	71.50±11.24			
Not in employment	14(10.3)	61.29±13.77			
Retired	52(38.2)	58.94±13.82			
Semi-retired with some employment/ casual work	10(7.4)	67.30±7.07			
Post hoc multiple comparison – significant findings					
Retired compared with Employed fulltime					0.020
Retired compared with Employed part-time or casual less than 20 hours per week					0.028

Gender and ethnicity

Gender Distribution
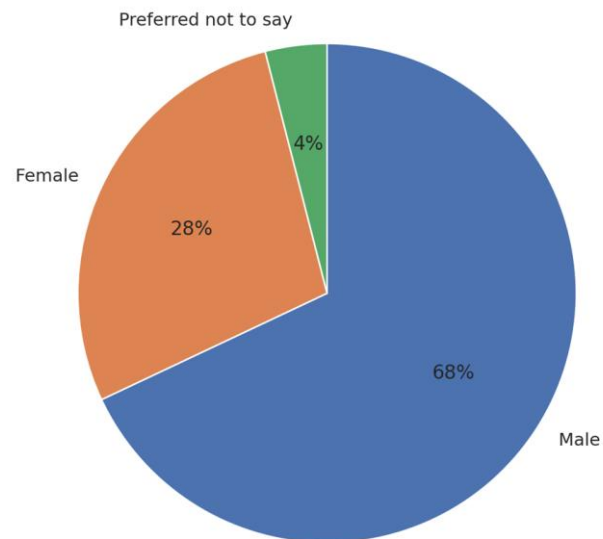
Variable	N(%)	Score	T/F	df	P-value/Sig
Gender			1.549	2	0.216
Male	93(68.4)	64.31±12.49			
Female	38(27.9)	59.82±15.21			
Prefer not to answer	5(3.7)	64.00±13.11			

Ethnicity of Participants

Variable	N(%)	Score	T/F	df	Sig
Ethnicity			0.388	3	0.762
European (inc. New Zealand European)	113(83.1)	62.87±13.79			
Māori (inc. Māori/European)	6(4.4)	60.17±9.90			
Asian	15(11.0)	64.67±12.37			
Other	1(.7)	74			

Age Distribution

Age

Variable	N(%)	Score	T/F	df	P-value/Sig
Age			0.763	3	0.517
80-95 years	8(5.9)	63.00±10.74			
70-79 years	31(22.8)	61.87±11.39			
60-69 years	26(19.1)	65.81±10.08			
40-59 years	34(25.0)	65.88±14.42			

Income and Region

Income Levels

Region of Residence
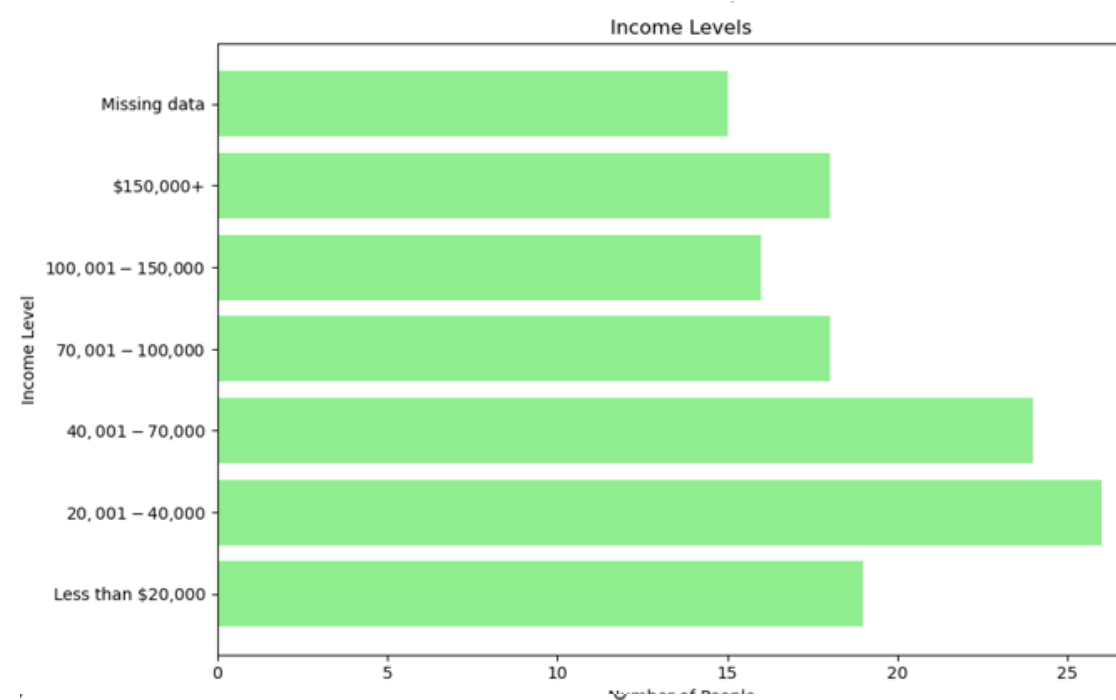
Variable	N(%)	Score	T/F	df	P-value/Sig
Income			1.362	5	0.244
$150 000+	18(13.2)	66.94±15.15			
$100,000-$150,000	16(11.8)	66.50±11.79			
$70,001-$100,000	18(13.2)	62.39±11.32			
$40,001-$70,000	24(17.6)	65.25±12.70			
$20,001-$40,000	26(19.1)	60.50±14.55			
Less than $20,000	19(14.0)	57.89±15.12			
Post hoc multiple comparison – significant findings					
Less than $20,000 compared with $150,000+					0.046
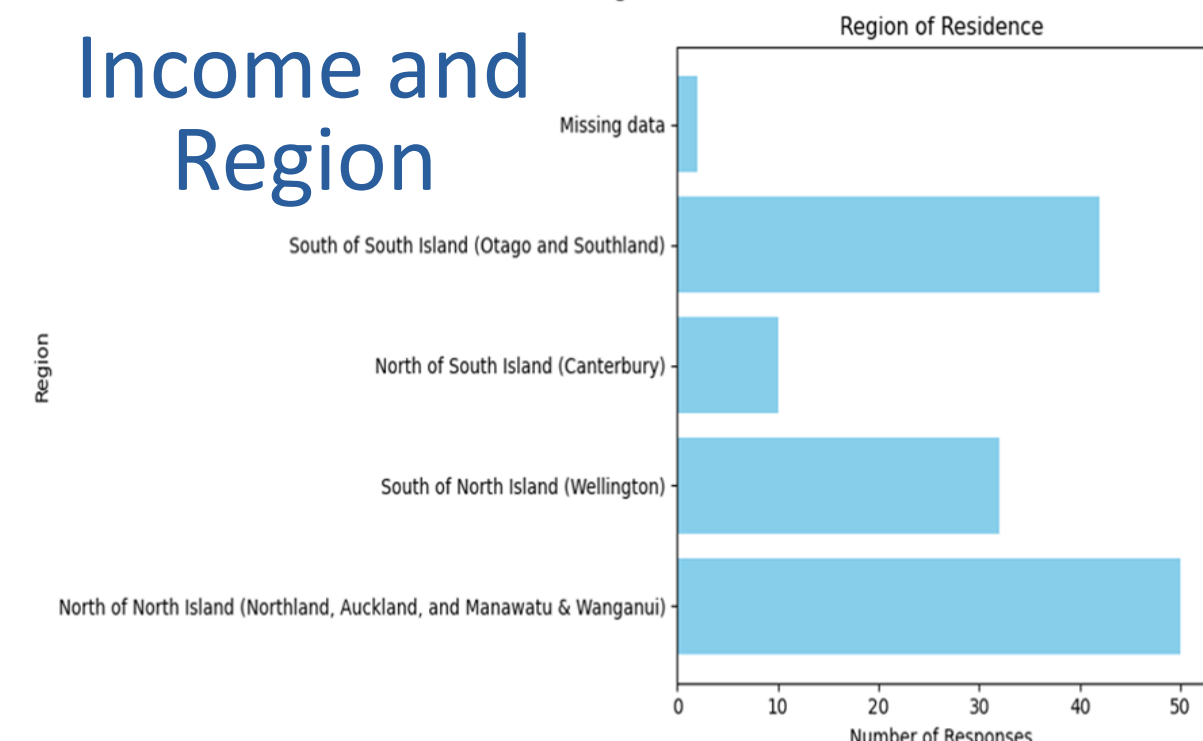
Variable	N(%)	Score	T/F	df	P-value/Sig
Region where living			1.128	3	0.340
South of South Island (Otago and Southland)	42(31.3)	62.43±11.37			
North of South Island (Canterbury)	10(7.5)	68.20±15.09			
South of North Island (Wellington)	32(23.9)	65.34±13.43			
North of North Island (Northland, Auckland, and Manawatu & Wanganui)	50(36.8)	61.26±14.61			

Educational impact

Hours of Education Received Distribution
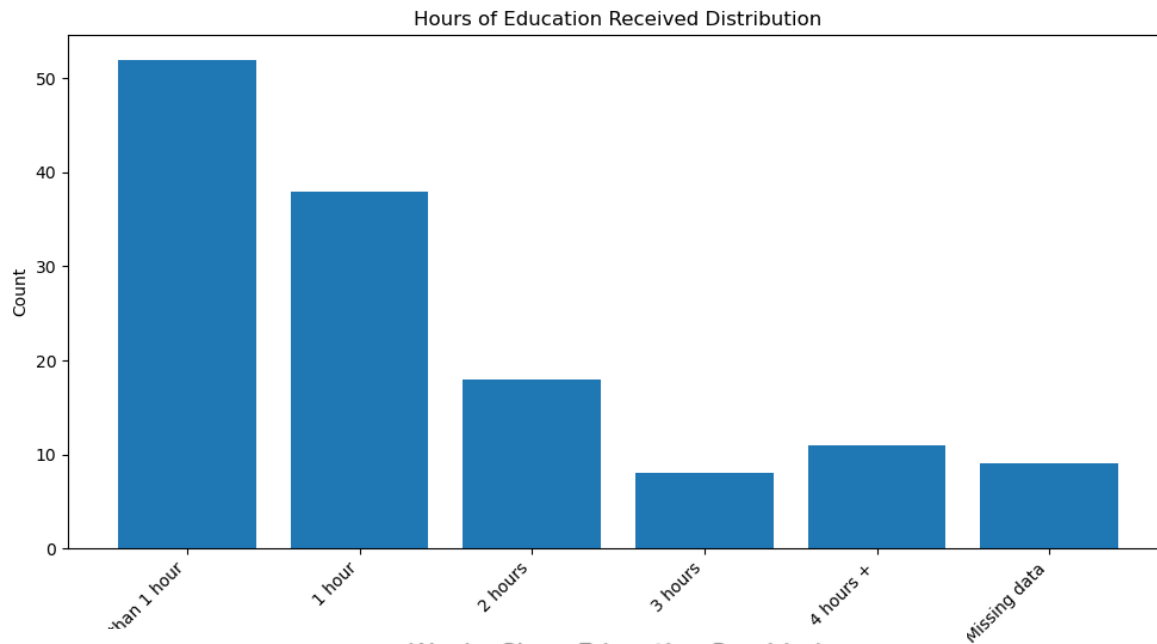
Variable	N(%)	Score	T/F	df	P-value/Sig
Education Hours			0.810	5	0.545
Less than 1 hour	52(38.2)	63.83±13.65			
1 hour	38(27.9)	61.82±12.67			
2 hours	18(13.2)	65.83±13.93			
3 hours	8(5.9)	56.00±16.90			
4 hours +	11(8.1)	65.64±11.45			
No answer entered	9(6.6)	61.22±13.08			

Weeks Since Education Provided
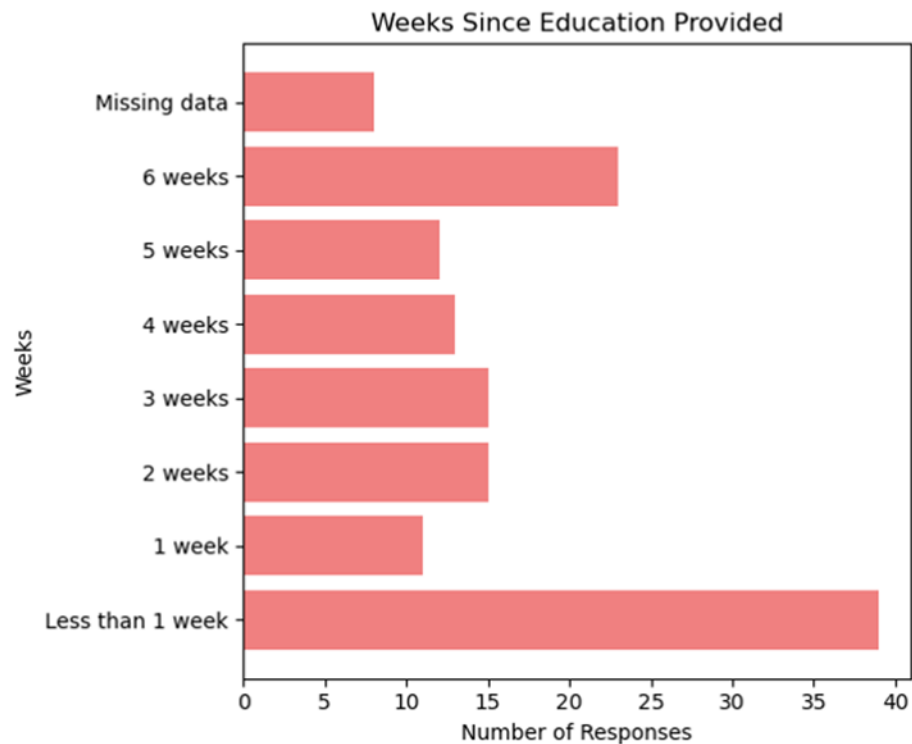
Variable	N(%)	Score	T/F	df	P-value/Sig
Weeks since education			0.841	6	0.541
Less than 1 week	39(28.7)	61.54±15.45			
1 week	11(8.1)	57.73±12.55			
2 weeks	15(11.0)	63.67±9.99			
3 weeks	15(11.0)	61.80±13.15			
4 weeks	13(9.6)	66.69±11.01			
5 weeks	12(8.8)	63.83±8.08			
6 weeks	23(16.9)	66.78±15.97			

Related to conditions and treatments

Variable	N(%)	Score	T/F	df	P-value/Sig
Co-morbidities			0.692	9	0.715
High BP	8(5.9)	64.00±9.65			
Heart attack	12(8.8)	64.50±12.44			
Heart failure	2(1.5)	63.00±7.07			
Diabetes Type 1	1(0.7)	70.00			
Diabetes Type 2	3(2.2)	63.33±12.50			
High cholesterol	10(7.4)	57.70±14.39			
Mental health issues	2(1.5)	79.50±4.95			
Multi conditions	79(58.1)	62.99±14.236			
Others	5(3.7)	68.40±9.68			
No other issues noted	14(10.3)	60.57±13.11			

Variable	N(%)	Score	T/F	df	P-value/Sig
Heart Procedures			0.128	4	0.972
CABG	14(10.3)	61.57±8.09			
Stent	81(59.6)	62.72±14.51			
None	22(16.2)	64.23±11.71			
Other	12(8.8)	64.33±14.68			

Answers Across the Knowledge Areas

Answer percentage per domain of knowledge
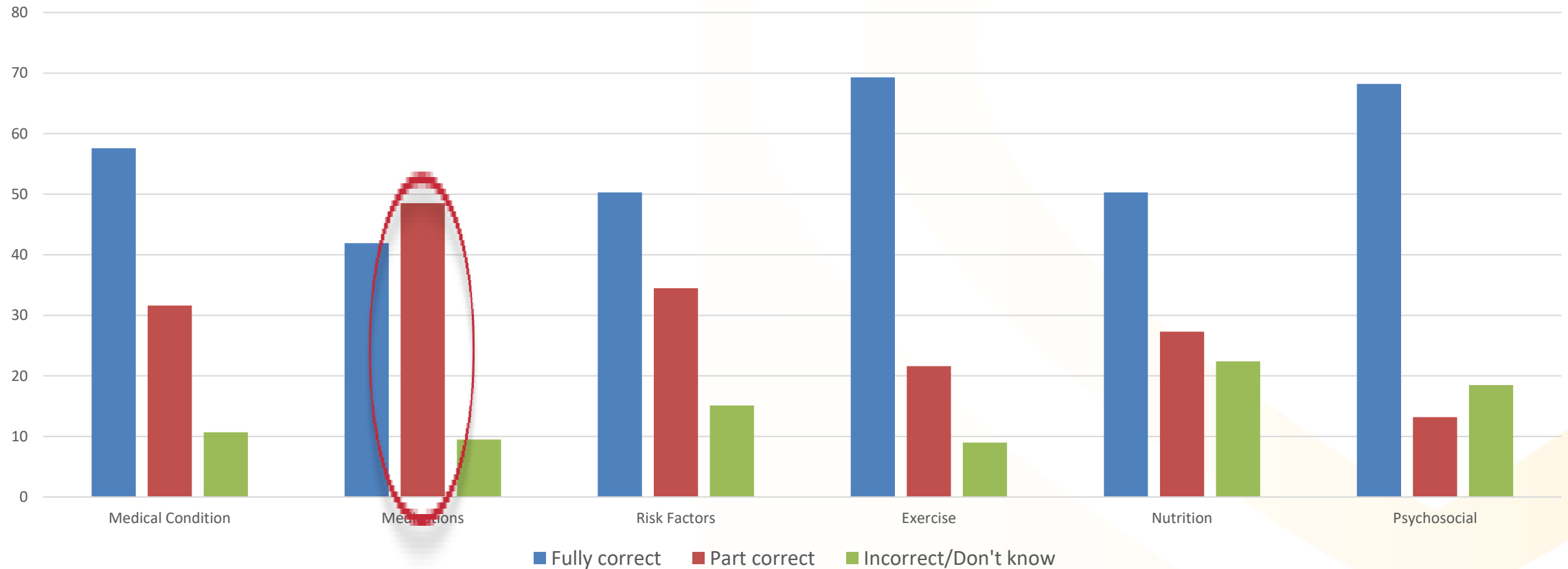
Answers Across the Cardiac Domains of Knowledge

Domain	MC answer percentage:	Answers	Percentage
Medical condition	Correct	549/952	57.6%
	Partially correct	301/952	31.6%
	Incorrect/Don't know	102/952	10.7%
Medication questions	*Correct*	*171/408*	*41.9%*
	Partially correct	*198/408*	*48.5%*
	Incorrect/Don't know	*39/408*	*9.5%*
Risk factors	Correct	342/680	50.3%
	Partially correct	235/680	34.5%
	Incorrect/Don't know	103/680	15.1%
Exercise	Correct	660/952	69.3%
	Partially correct	206/952	21.6%
	Incorrect/Don't know	86/952	9.0%
Nutrition	Correct	479/952	50.3%
	Partially correct	260/952	27.3%
	Incorrect/Don't know	213/952	22.4%
Psychosocial	Correct	464/680	68.2%
	Partially correct	90/680	13.2%
	Incorrect/Don't know	126/680	18.5%

Amplifying the Patient Voice

https://blogs.bmj.com/bjsm/files/2018/03/Snip20180313_7.png

Patient perspectives on understanding their medical condition

Limited pre-hospital knowledge
Many patients did not recognise cardiac symptoms or realise they were experiencing a heart attack.

"What I thought was indigestion... I thought oh, I'll go into the 24-hour surgery and they'll give me something to get rid of the indigestion." (7P)

Symptoms misunderstood or normalised
Patients often minimised or misattributed their symptoms before seeking help.

"I didn't know I was having a heart attack… it just felt like indigestion more than anything." (4P)

Hospitalisation increased awareness
Understanding grew during hospital stay, with hospitalisation acting as a catalyst for learning.

"Hospital largely reinforced that, rather than gave me new information." (6P)

Knowledge was incremental and personalised
Learning happened gradually and built on prior experiences.

"You just add a little bit more to your knowledge as you go along." (6P)

Variability in initial knowledge levels
While some gained insight in hospital, others had very limited prior understanding of disease processes.

"I didn't quite know, really what I should know." (7P)

Patient perspectives on understanding their medications

Mixed Levels of Drug Action Understanding
Patients' grasp ranged from basic to fairly detailed:

"These pills… promote the growth of blood vessels and everything and they're hoping that, if you take it – you'll probably be on the same thing." – 1P
"Yeah reducing the blood pressure and… helping make the heart… work a lot easier. Oh, there's one to stop clots forming on the stent." – 2P

Overwhelmed by Medication Volume
Sudden introduction of multiple medications felt unmanageable.

"Like it's about 12 different kinds of medications I'm meant to take for breakfast!"
– 6P

Patient perspectives on understanding their risk factors

1. Identification of Lifestyle and Risk Factors
Patients showed general awareness of diet, exercise, and harmful habits.

"I knew about diet, I knew about exercise." – 6P

"Things like smoking and drinking. Wrong diet. And if something is very high in carbohydrates." – 4P

2. Emphasis on Family History
Family genetics seen as a strong (sometimes dominant) risk factor.

"My grandfather was 45, my father 41, my uncle's 39... all dead of heart attacks." – 1P

"That's filled in another gap for me. My lifestyle factor was hereditary and that was it." – 7P

3. Gaps in Knowledge (Subconscious Misunderstanding)
Limited awareness of silent risk factors like cholesterol and diabetes.

"I didn't know I had cholesterol until they gave me sheets in the hospital..." – 3P

"I asked him [GP] what my cholesterol had been... up around six... but he'd never mentioned it was high." – 4P

"10 years ago I was diagnosed as a type II diabetic... I was pretty much doing the exercise and diet bit already... why, all of a sudden do I have a heart attack?" – 2P

4. Sense of Disbelief
Shock at diagnosis despite perceived healthy living.

"Won't happen to me because I run marathons... I've never smoked... I don't drink much either." – 1P

"You never think you're going to get sick because you're so fit... and just think they can burn it off." – 5P

sification: |

Patients' Perceptions of Exercise Knowledge

Programme Clarity

Some patients found the exercise plans helpful, others unclear or hard to apply.

"The physio put me in my place good and proper about exercise. Told me that I was not allowed to exercise like I had been…" (3P)

"How do you put that [effort scale] into real terms?" (2P)

Individualised Pathways

Patients wanted plans tailored to their pre-existing fitness levels or confidence after testing.

"I felt a lot more confident after the stress test… that gave me a bit of confidence." (7P)
"My striding out is quite astronomical… how is that fitting in terms of what they're expecting?" (2P)

Perceived Discrepancies in Guidance

Confusion existed about how much exercise was safe or enough.

"So do I stop or should I push myself to expand my capabilities again?" (6P)

Self-Management of Return to Exercise

Many adapted formal plans to their lifestyles and environments.

"I'm doing a lot of physical work… that's just going to have to be my exercise." (4P)
"I didn't even know how to stroll… I find I'm going flat out instead of taking an easy walk." (3P)

Knowledge Around Benefits

Some patients understood the general benefits but questioned application.

"I haven't had any adverse effects… so nothing's indicating that I should stop." (4P)

Patients' perceptions of nutritional knowledge

Clarity of Guidance

- Many patients found dietary recommendations **confusing**, especially due to **frequent changes** in guidelines.

"Eggs were out and then eggs were in and now it's three a week... some things come and go." (6P)

Evolving Understanding and Self-Education

- Patients used **Heart Foundation materials**, online sources, and personal research to enhance their understanding.

"I looked up... foods that are known to sort of help reduce cholesterol like your good fats... oats I believe is very good." (4P)

Desire for More Comprehensive Education

- There was a call for **practical, tailored input**, ideally from a dietitian.

"Having a dietician that can sort of go through all the different sorts of foods that would help." (4P)

Family Involvement

- Some relied on **partners or family members** to manage dietary changes.

"My wife keeps me on a strict sort of, what I can eat." (1P)

Perceptions of Impact on Cardiac Health

- Patients made **direct links between poor diet and their cardiac event**, sometimes in hindsight.

"I knew I was eating too much chocolate... that wasn't wise. And I know now it wasn't wise." (3P)
"I was grabbing stuff like pies and chips... I was naïve to all that." (5P)

Motivation to Change

- Many expressed a **proactive approach** and willingness to adapt their diet post-event.

"We only have chicken and fish mainly... very rarely do we have red meat. Mostly it's either vegetarian, chicken or fish." (4P)

Patients' perceptions of psychosocial & mental health education

Psychosocial education was minimal or vague during hospital admission

- Patients consistently reported a **lack of structured or meaningful psychosocial education** during their hospital stay.
- When psychosocial topics were mentioned, they were often limited to **vague comments** (e.g., mood swings, forgetfulness), without sufficient detail or practical guidance.
  - *"Just some vague statements like that."* (6P)
  - *"It was vague, it was general, generic almost."* (2P)

Mental health was not a personal concern for some patients at the time

- Some participants felt that **mental health issues were not relevant** to them during their hospitalisation, and therefore didn't seek or retain information in this area.
  - *"I just thought I'm not worried about that... I haven't actually thought about it, but now I might!"* (7P)

Patients acknowledged hospitalisation may not be the ideal time

- There was general agreement among patients that the **acute hospital phase may not be the best time** to receive or process psychosocial education.
- Many seemed to **prefer psychosocial education post-discharge**, when they are more emotionally and cognitively able to engage with it.

Reflections prompted re-evaluation of needs

- Some patients, when prompted during focus groups, reflected that they **might have benefited from more mental health education** than they initially realised.
  - *"The fact that you're raising it... makes me start to think perhaps I should have had more."* (6P)

Concerns about added stress if mental health was discussed during hospitalisation

- A few patients felt that **introducing mental health topics during the initial admission** could add unnecessary emotional burden.
  - *"I think it would probably put a bit more stress on to the mind."* (2P)

International comparisons

Key Trends Identified

- **Canada** consistently reports the **highest CADE-QII scores**, suggesting stronger baseline cardiac knowledge.

- **China** and **Brazil** show the **lowest scores**, indicating potential gaps in pre-rehabilitation education.

- **Aotearoa New Zealand** ranks **mid-range**, with results most closely aligned with Canadian studies from 2015.

👥 **Demographic Insights**

- **Gender**: Males generally scored higher than females across most studies.

- **Education**: Higher levels of prior education were associated with higher CADE-QII scores.

- **Comorbidities**: Reporting varied significantly, making cross-study comparisons difficult.

📌 **Challenges in Comparison**

- Inconsistent reporting formats across studies (e.g., different total scores, missing demographic breakdowns).

- Variability in how comorbidities and domains were presented.

- Despite these, general trends in knowledge levels and demographic influences were still observable.

Making sense of this together

Domain	Survey Results (CADE-QII)	Patient Perceptions (Qualitative)	Mixed Methods Insight
Overall Knowledge	Patients demonstrated a solid understanding across domains.	Patients tended to underestimate their own knowledge.	Knowledge may be present, but **confidence is lacking**.
Exercise	High knowledge scores regarding safe exercise and its role in recovery.	Anxiety about restarting exercise; fear of doing harm.	Gap likely due to **self-efficacy**, not knowledge.
Nutrition	Moderate scores; highest incorrect answers but may be related to perception of guidelines.	Patients found information confusing and overwhelming.	**Information overload** or inconsistency may obscure understanding.
Mental Health	Lower knowledge scores across some participants.	Not prioritised during hospital stay; described as vague or unmemorable. Some later reflection suggested a missed opportunity.	Mental health education is **under-addressed** and **poorly retained**.
Psychosocial Impact	Acknowledged as important in broader discussions, not captured in survey.	Patients did not expect support during hospitalisation, yet later considered it might have been beneficial.	Psychosocial support may need to be **timed differently** (e.g., in outpatient settings).

Implications for Clinical Practice

1 **2** **3** **4** **5**

1. Assess patient knowledge early Implement a **national standardised baseline assessment** (e.g., CADE-QII) to identify individual knowledge gaps at the start of the inpatient stay, allowing for more targeted education.

2. Screen for psychosocial risk Introduce **early psychosocial screening** (e.g., HADS) as part of standard care to address mental health concerns that may hinder recovery and engagement with education.

3. Tailor education to individual needs Use knowledge and psychosocial assessments to deliver **prioritised, individualised, and culturally sensitive education**, focusing only on what the patient does not yet know.

4. Consider social and demographic factors Recognise how **age, ethnicity, health literacy, education level, employment status, and smoking** impact patient understanding and design appropriate interventions accordingly.

5. Support continuity and improvement Conduct **ongoing knowledge assessments** post-discharge and during cardiac rehab; use data to **inform practice, improve quality**, and adapt education strategies over time.

Thank you, and any questions