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### MENTAL HEALTH AND WELL-BEING

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# Perfectionism as a mediator of psychological distress: implications for addressing underlying vulnerabilities to the mental health of medical students

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## Introduction

- Medical students have personalities that are often shown to be perfectionistic
- Perfectionism can manifest as maladaptive and lead to psychological distress
- This study examined the mediating role of perfectionism on the association between personality trait profiles and levels of psychological distress

## Methods

- First year medical students completed a questionnaire containing measures of personality, perfectionism (Concern over Mistakes: CoM), stress, anxiety and depression
- Latent profile analysis classified students based on their personality traits and identified a profile vulnerable to psychological distress
- Structural equation models examined the mediation effects of perfectionism on the relationship between the vulnerable personality profile and distress

## Results

- The sample totalled 376 (84% response)
- The vulnerable personality profile was highest in Harm Avoidance, lowest in Self-Directedness and significantly correlated with the highest perfectionism-CoM
- High Perfectionism-CoM was associated with the highest levels of stress, anxiety and depression
- Perfectionism-CoM was a significant mediator for the relationship between personality and higher levels of psychological distress

## Personality Profiles



Figure 1: The three identified temperament and character personality profiles. Temperament traits: NS: Novelty Seeking, HA: Harm Avoidance, RD: Reward Dependence, PS: Persistence. Character traits: SD: Self-Directedness, CO: Cooperativeness, ST: Self-Transcendence. Mean temperament and character trait levels are calculated from a 5 point Likert scale. 1.00-1.50 = very low, 1.51-2.50 = average, 3.51-4.50 = high, 4.51-5.00 = very high. Profile 1, n = 212; Profile 2 n = 64; Profile 3, n = 100

Table. High and low descriptors for each temperament and character trait

Temperament traits	Represents.....	Low scores	↔	High scores
Novelty Seeking [NS]	Exploratory activity in response to novelty	Orderly, reflective, reserved	↔	Exploratory, curious, seeks challenge
Harm Avoidance [HA]	Worry in anticipation of problems	Confident, accepting of uncertainty & risk	↔	Anxious, uncomfortable with accepting risk
Reward Dependence [RD]	Dependence on approval of others	Not influenced by others, objective, insensitive	↔	Needs to please, warm, attached, sociable
Persistence [PS]	Industriousness despite obstacles	Quitting, underachiever, erratic, unambitious	↔	Ambitious, hard worker, diligent, perfectionist
Character traits			↔	
Self-Directedness [SD]	Responsibility, goal orientated & self-confidence	Blaming, ineffective, unreliable, irresponsible	↔	Conscientious, self-accepted, reliable,
Cooperativeness[CO]	Tolerance, empathy & cooperativeness	Intolerant, critical opportunistic, unhelpful	↔	Tolerant, agreeable, constructive, empathic
Self-Transcendence [ST]	View of self in relation to universe	Impatient, proud, materialistic, practical	↔	Patient, humble, spiritual, creative, compassionate

\*Adapted from Eley et al. (2017).

## Perfectionism and DASS by Personality Profile

	Profile 1		Profile 2 <sup>a</sup>		Profile 3		ANOVA			
	M	SD	M	SD	M	SD	F	df	p	eta-sq
Perfectionism	18.98	5.28	24.32	5.53	15.08	5.24	58.44	2	<0.01	0.242
Depression	5.18	2.94	11.26	4.18	2.56	1.66	43.98	2	<0.01	0.191
Anxiety	6.58	2.88	9.36	3.71	4.64	2.82	11.93	2	0.01	0.060
Stress	9.80	3.38	14.04	4.02	7.78	2.77	17.27	2	<0.01	0.085

M: mean; SD: standard deviation.

<sup>a</sup>Profile 2 is significantly higher ( $p < 0.01$ ) in mean levels of Perfectionism-CoM, Depression, Anxiety and Stress.

## Mediation Analysis

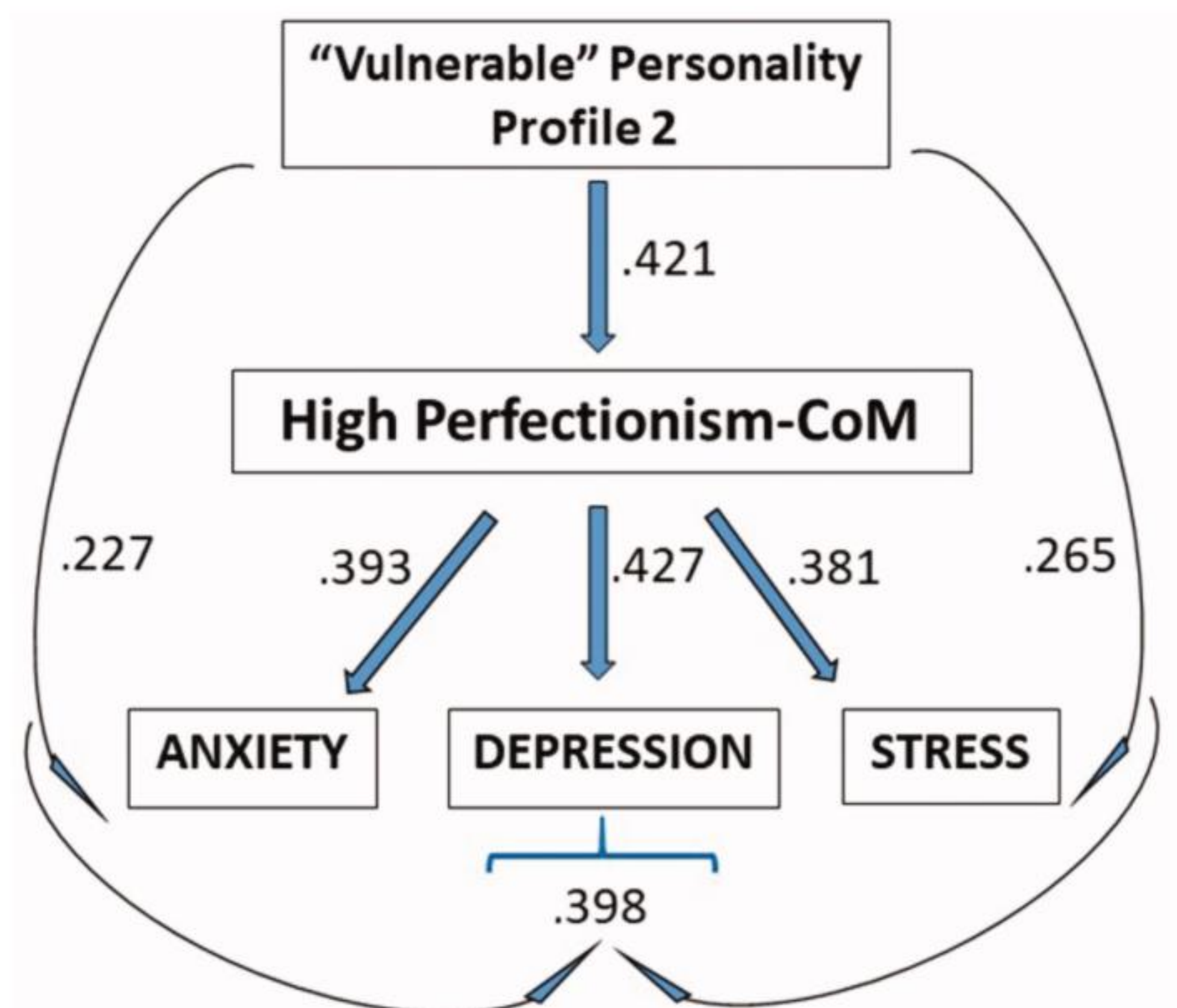


Figure 2: Conceptual model of the mediation effects of perfectionism on the relationship between personality Profile 2 and anxiety, depression and stress. Note Bivariate Pearson's correlation co-efficients are presented controlling for sex and age. Moderate to strong correlations are bold and significant at  $p < 0.001$ . All others are significant at  $p < 0.01$ .

## Discussion

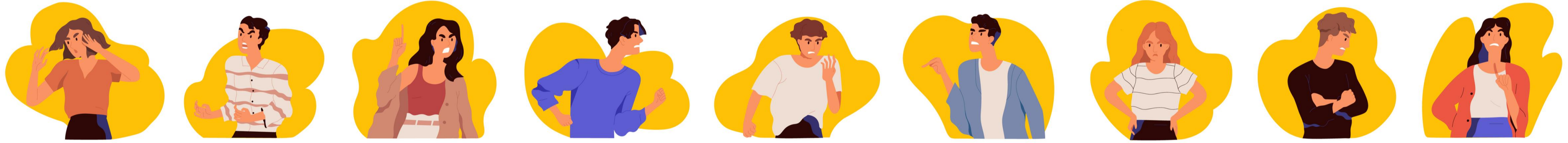
- Certain personality profiles are predisposed to psychological distress such as anxiety, stress and depression
- Perfectionism, as a mediator between personality and psychological distress may be a target strategy to help increase student's self acceptance and self-awareness of their perfectionistic tendencies and lower their vulnerability to poor mental health

## Disclosure

The authors have no conflicts of interest to declare

# Intravenous Ketamine Infusion & Anxiety, Irritability, and Agitation: Implications for Treating Mixed Features in Adults with Major Depressive/Bipolar Disorder

Roger S. McIntyre, Orly Lipsitz, Nelson B. Rodrigues, Yena Lee, Danielle S. Cha, Maj Vinberg, Kangguang Lin, Gin S. Malhi, Mehala Subramaniapillai, Kevin Kratiuk, Andrea Fagiolini, Hartej Gill, Flora Nasri, Rodrigo B. Mansur, Trisha Suppes, Roger Ho, Joshua D. Rosenblat

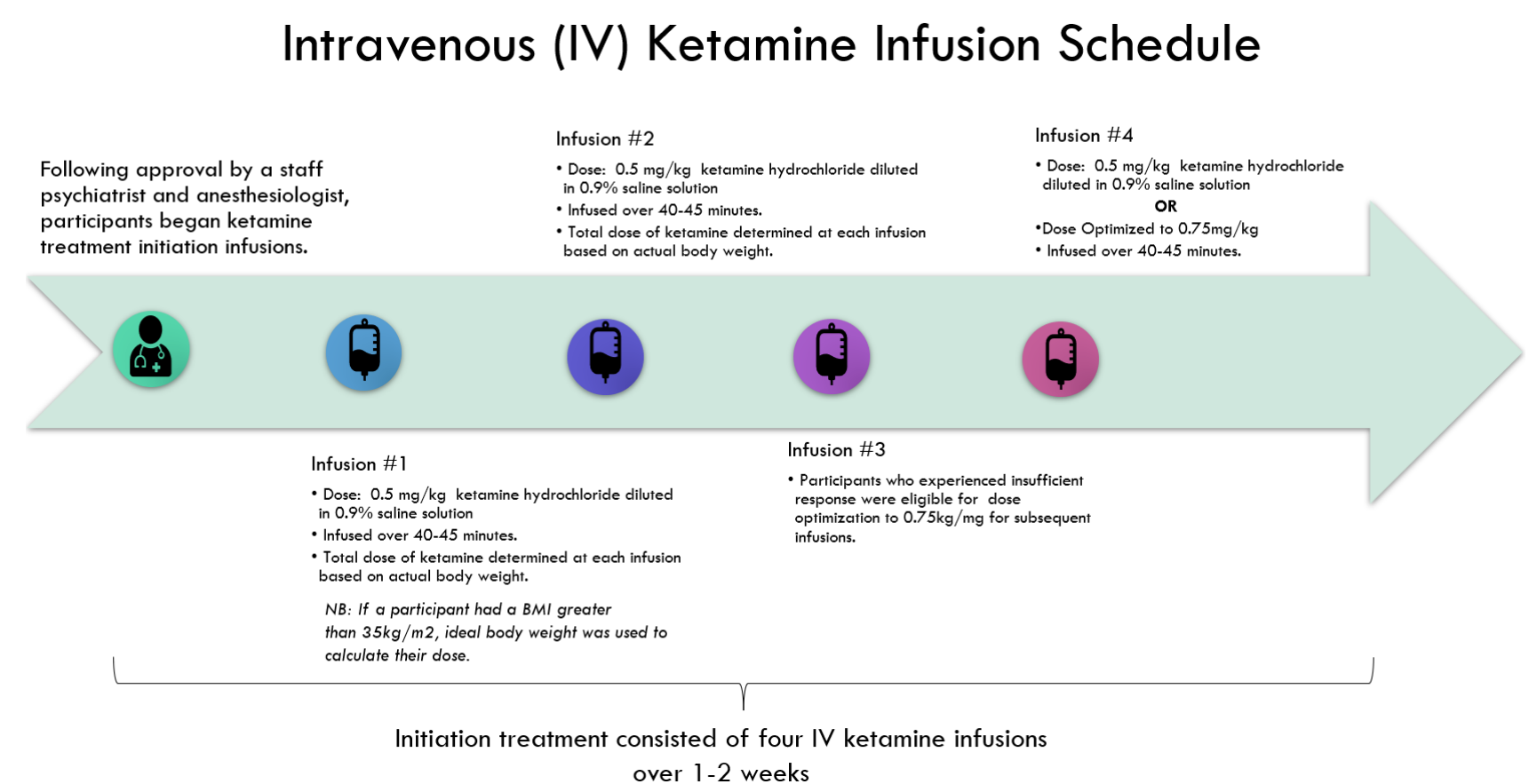


## Introduction

- “The DSM-5 Mood Disorders Work Group recognized that individuals rarely meet full criteria for both episode types at the same time.
- In order to be diagnosed with the new specifier in the case of major depression, the new DSM-5 specifier will require the presence of at least three manic/hypomanic symptoms that don't overlap with symptoms of major depression.
- In the case of mania or hypomania, the specifier will require the presence of at least three symptoms of depression in concert with the episode of mania/hypomania.” [1]
- An estimated 20% - 60% of patients present with mixed features
- Mixed features often have a more complex illness presentation, higher rates of non-recovery and chronicity, as well as less favourable response to conventional antidepressants [2]
- A criticism of the DSM-5 definition of mixed features is the exclusion of “overlapping” symptoms (e.g., anxiety, irritability, and agitation; AIA), which are some of the most common symptoms in patients presenting with both hypomanic & depressive symptoms
- We sought to determine the effectiveness of intravenous (IV) ketamine in adults with TRD in the context of Major Depressive Disorder (MDD) or Bipolar Disorder (BD), who were presenting with AIA and suicidal ideation (SI)

## Methodology

- Data included in this analysis were derived from patients receiving repeat dose IV ketamine infusions at the Canadian Rapid Treatment Center of Excellence (CRTCE) between July 2018 & December 2019 per the schedule illustrated below:

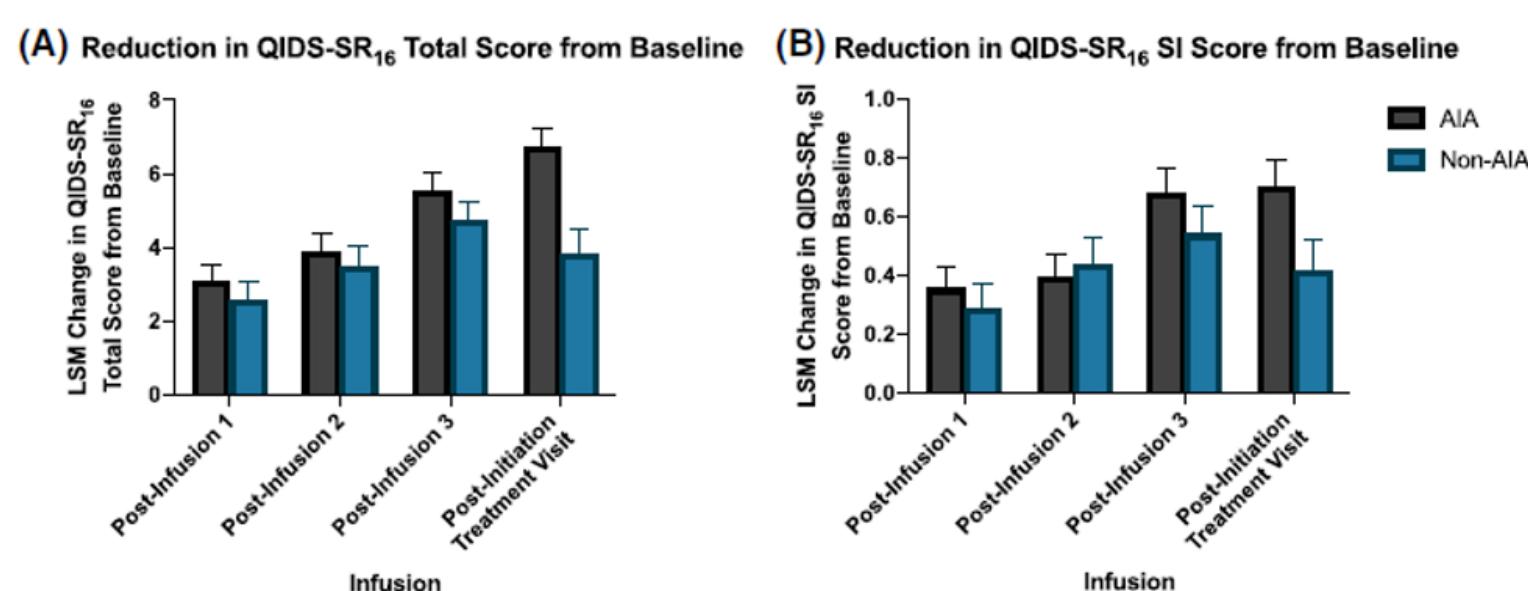


- Participants with comorbid psychiatric conditions were eligible for IV ketamine treatment if their primary diagnosis was MDD or BD, meeting Stage 2, or higher (inadequate response to  $\geq 2$  antidepressant trials), TRD
- Retrospective data analyses were performed using a repeated measures hierarchical model to evaluate changes in Quick Inventory of Depressive Symptomatology Self-Report (QIDS-SR16) total score, QIDS-SR16 SI score, Generalized Anxiety Disorder 7-item (GAD-7) anxiety score, GAD-7 irritability score, & GAD-7 agitation scores across IV ketamine infusions to determine its effectiveness in mitigating AIA and SI in patients with MDD or BD

## Results

- Participants with AIA experienced a significantly greater reduction in:

- Overall Depressive Symptoms**  
( $F(1, 558) = 9.49, P = .002$ )
- Suicidal Ideation**  
( $F(1, 558) = 3.103, P = .079$ )



Least square mean difference and standard error from baseline to each infusion on QIDS-SR16 total (2A) & SI (2B) scores for patients with and without AIA (as measured by GAD-7)

- Anxiety**  
( $F(1, 198) = 5.52, P = .007$ )
- Irritability**  
( $F(1, 198) = 28.35, P < .001$ )
- Agitation as measured by “trouble relaxing”**  
( $F(1, 198) = 6.70, P = .010$ )

## Acknowledgement

This research has been conducted with the support of the Canadian Rapid Treatment Center of Excellence.

## References

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# Safety & Tolerability of IV Ketamine in Adults with Major Depressive or Bipolar Disorder

Nelson B. Rodrigues, Roger S. McIntyre, Orly Lipsitz, Yena Lee, Danielle S. Cha, Flora Nasri, Hartej Gill, Leanna M.W. Lui, Mehala Subramaniapillai, Kevin Kratiuk, Kangguang Lin, Roger Ho, Rodrigo B. Mansur, Joshua D. Rosenblat

## Introduction

- Major depressive disorder (MDD) is a leading cause of disability
- Most individuals with MDD receiving conventional antidepressants do not achieve full syndromal recovery [1]
- The dissociative anesthetic and N-Methyl-D-Aspartate (NMDA) receptor antagonist, ketamine, has demonstrated rapid and robust efficacy in adults who have not experienced sufficient syndromal relief following multiple antidepressant treatment trials (i.e., treatment-resistant depression [TRD]) [2]
- Patients receiving sub-anesthetic doses of ketamine describe sensations of depersonalization, derealization, distortions of time or space, and transient amnesia [3]
- The safety and tolerability of long-term ketamine treatment is insufficiently characterized

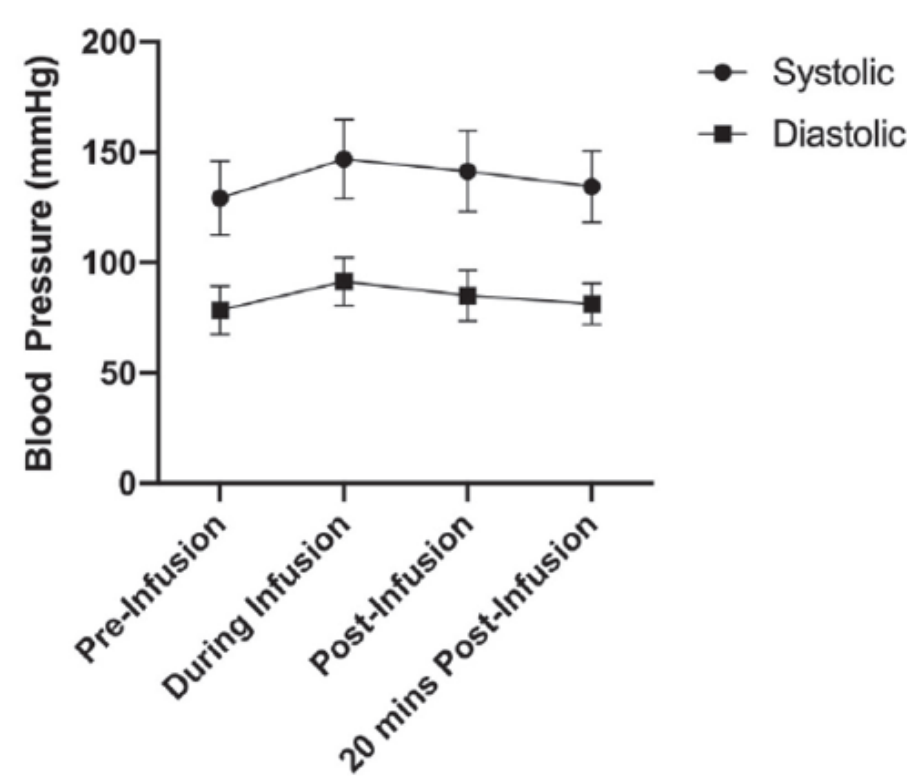
## Hypothesis

Intravenous ketamine after repeat dose administration will be safe & tolerable in a real-world outpatient setting providing care to adults with TRD

## Results

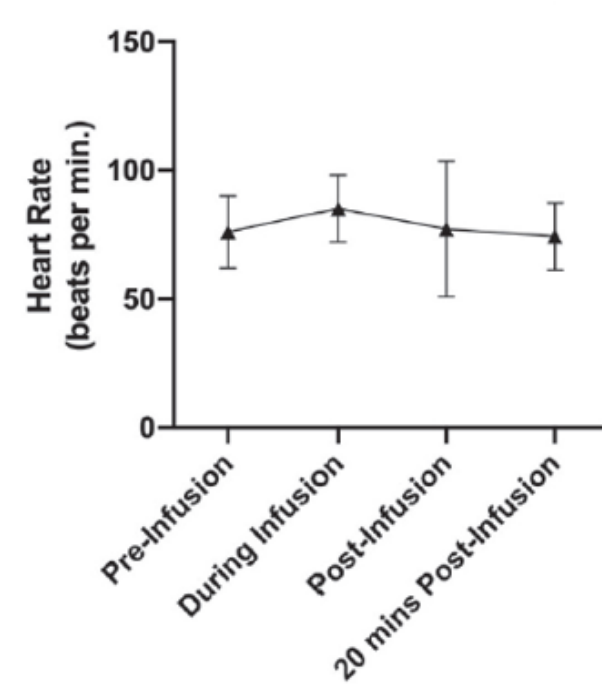
- Blood pressure significantly increased during infusion, with 44.3% meeting criteria for treatment-emergent hypertension (i.e., blood pressure  $\geq$  165/100 mmHg)
- 12% of patients exhibiting hypertension required pharmacological intervention (i.e., labetalol 5–30 mg or amlodipine 10 mg)

a. Change in Blood Pressure During Ketamine Infusion



(a). Mean (SEM) systolic and diastolic BP change over the course of infusion, with each timepoint representing the average across four infusions.

b. Change in Heart Rate During Ketamine Infusion



(b). Mean (SEM) change in HR over the course of infusion, with each timepoint representing the average across four infusions.

- Systolic BP rose by  $17.9 \pm 13.4$  mmHg ( $t[649] = -34.1, p < 0.0001$ ), diastolic pressure rose by  $12.9 \pm 10.3$  mmHg ( $t[647] = -32.1, p < 0.0001$ ; Figure 1(a)) and patients' HR increased by  $8.4 \pm 10.1$  beats per minute ( $t[628] = -20.8, p < 0.0001$ ; Figure 1b)
- Dissociation severity significantly attenuated after the first infusion but plateaued for subsequent infusions
- The most frequently reported adverse events included drowsiness (56.4%), dizziness (45.2%), dissociation (35.6%), and nausea (13.3%)

## Acknowledgement

This research has been conducted with the support of the Canadian Rapid Treatment Center of Excellence.

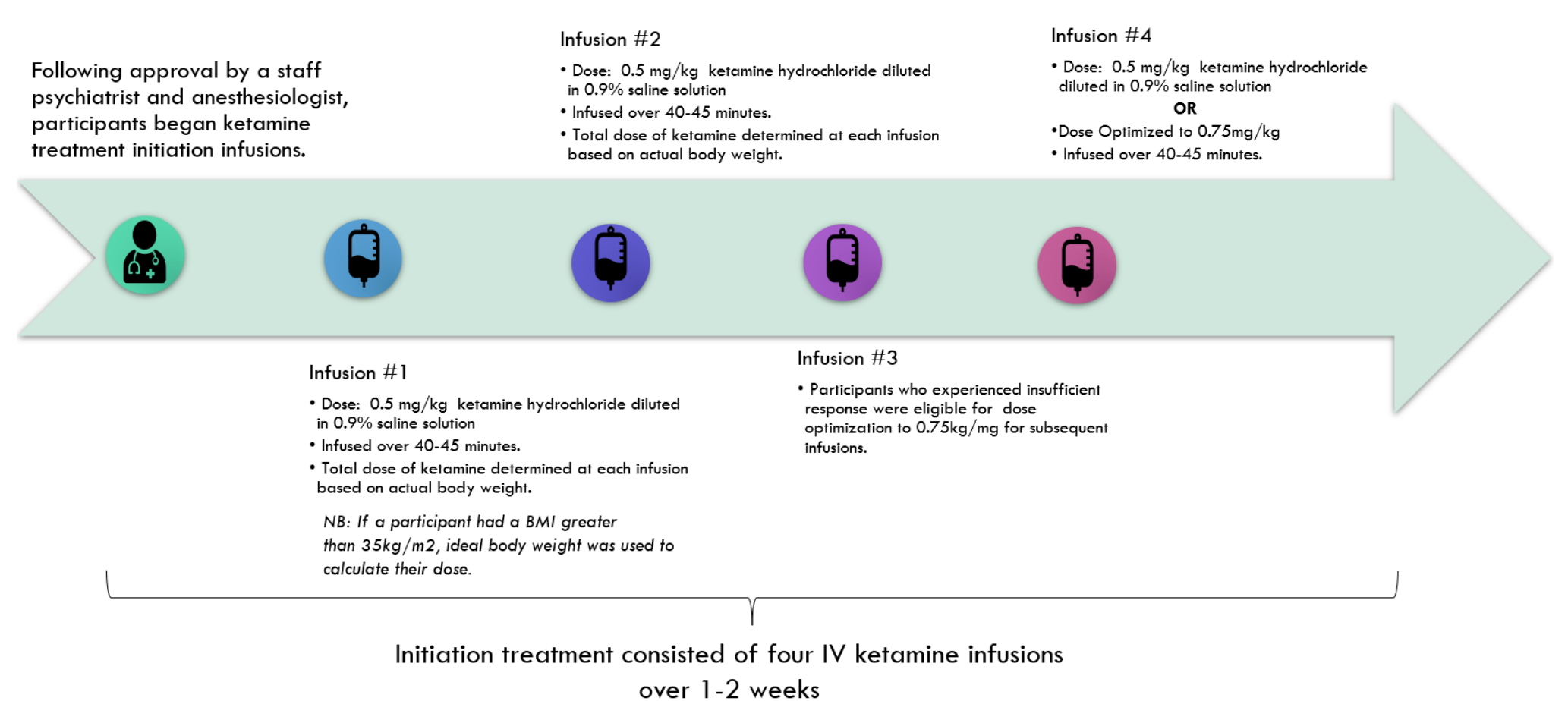
## References

- Rodrigues NB, McIntyre RS, Lipsitz O, Lee Y, Cha DS, Nasri F, et al. Safety and tolerability of IV ketamine in adults with major depressive or bipolar disorder: results from the Canadian rapid treatment center of excellence. *Expert Opin Drug Saf* 2020;19:1031–40.
- Comprehensive assessment of side effects associated with a single dose of ketamine in treatment-resistant depression. *J Affect Disord*. 2019. DOI:10.1016/j.jad.2019.11.028
- Li L, Vlisides PE. Ketamine: 50 years of modulating the mind. *Front Hum Neurosci*. 2016;10:612.
- Sanacora G, Frye MA, McDonald W, et al. A consensus statement on the use of ketamine in the treatment of mood disorders. *JAMA Psychiatry*. 2017;74:399–405.

## Methodology

- Patients included in this post-hoc analysis received repeat dose IV ketamine infusions at the Canadian Rapid Treatment Center of Excellence (CRTCE) between July 2018 & December 2019
- Patients were required to have Stage 2 TRD or higher (i.e., failure of  $\geq 2$  antidepressant trials of different classes)
- Exclusion criteria: inability to provide informed consent or a diagnosis of dementia, psychosis, and/or active substance or alcohol use disorder. Additionally, participants who were over 275 lbs., pregnant, experiencing symptomatic traumatic brain injury, or who had uncontrolled medical conditions (eg, allergy to ketamine, uncontrolled hypertension), were ineligible for IV ketamine treatment at CRTCE.
- Ketamine was delivered adjunctively to current concomitant medications
- Prior to the start of infusion, patient baseline blood pressure, heart rate and standard telemetry (i.e., respiratory rate & oximetry) were collected by anesthesiologists
  - Patient safety was monitored & recorded every 5 min. throughout the infusion & adverse events were assessed by the anesthesiologist & nurse both during infusion & directly after treatment
- The Clinician- Administered Dissociative States Scale (CADSS) was used to further characterize current symptoms of dissociation severity
- Safety was operationalized using transient changes in blood pressure (BP) & heart rate (HR). The pre-infusion, during infusion, post-infusion blood, & 20-min post-infusion BP & HR were each averaged across the 4 infusions & average values were used for analysis
- Tolerability was operationalized as dissociative symptom severity, as measured by the CADSS (assessed at all four timepoints); tolerability also evaluated treatment-emergent adverse events during infusion and 20 minutes post-infusion

## Intravenous (IV) Ketamine Infusion Schedule



## Discussion

- Ketamine was well-tolerated, with less than 5% of patients withdrawing due to tolerability concerns.
- The results from our analysis indicate that ketamine is safe and well tolerated when administered to adults with TRD in a specialized, multidisciplinary, community-based center such as the CRTCE.
- In keeping with recommendations from the American Psychiatric Association task force, it is essential that all persons receiving ketamine for TRD receive the treatment as part of a multidisciplinary approach [4]

# Intravenous Ketamine: Improving Symptoms of Anhedonia

Rodrigues, Nelson B, Roger S McIntyre, Orly Lipsitz, Danielle S Cha, Yena Lee, Hartej Gill, Amna Majeed, Lee Phan, Flora Nasri, Roger Ho, Kangguang Lin, Mehala Subramaniapillai, Kevin Kratiuk, Rodrigo B Mansur, Joshua D Rosenblat

## Introduction



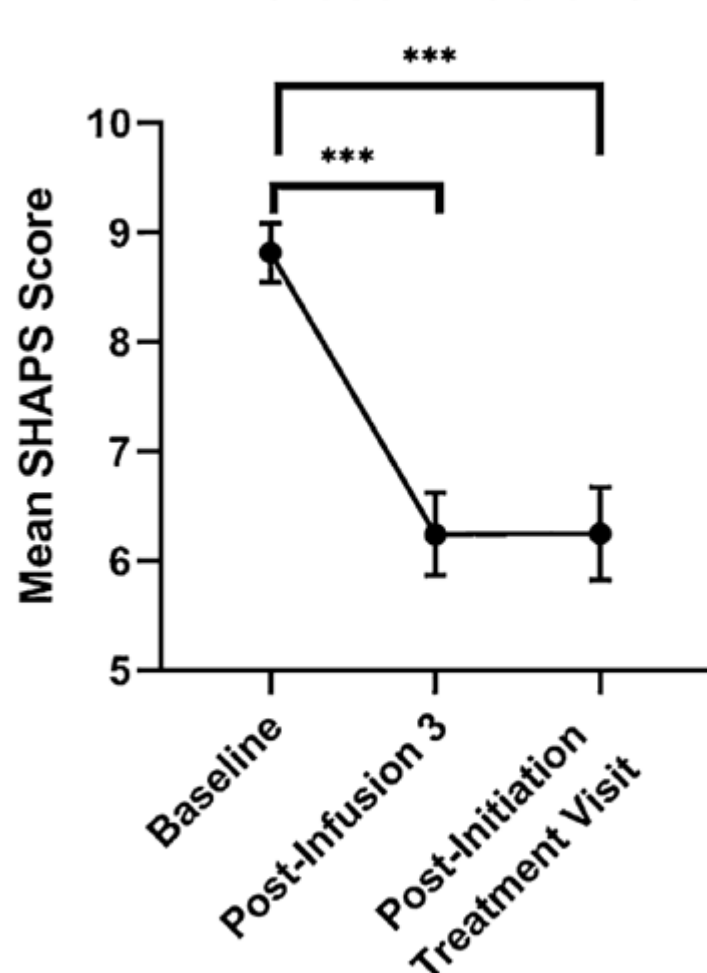
- Anhedonia is defined as the decreased subjective experience of pleasure or decreased anticipation of pleasure
- Anhedonia is a cardinal symptom of major depressive disorder (MDD) & bipolar disorder (BD)
- Anhedonia is a principal mediator of patient-reported outcomes including, but not limited to:
  - Quality of Life
  - Wellbeing
  - Psychosocial Function
- Amongst adults with remitted MDD, anhedonia has been reported to predispose and portend relapse & recurrence
- Moreover, adults with treatment-resistant depression (TRD) endorsing symptoms of anhedonia are often difficult to treat

## Results

- ✓ IV ketamine infusion was associated with significant improvements in anhedonia.

At baseline, 92% of patients presented with clinically significant anhedonia (i.e., SHAPS > 2), with approximately 67% of patients meeting criteria for high anhedonic symptoms.

Change in Anhedonic Severity Across Infusions

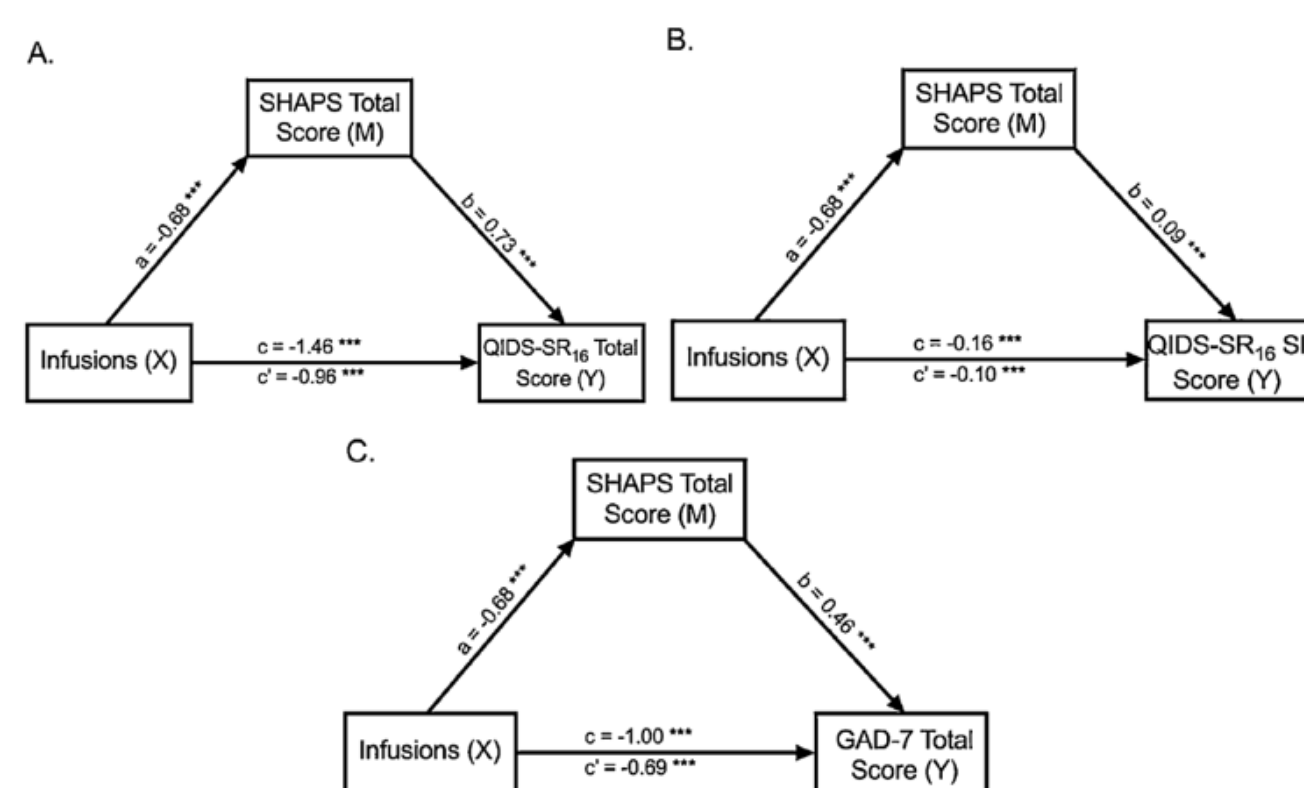


(Cohen's  $f = 0.50$ ).

\*\*\* significant associations at  $p < 0.001$ .

- ✓ Anhedonia was a significant partial mediator of improvements in depression, suicidality, & anxiety.

Overall improvement in anhedonia accounted for 26% of the variance observed in depression severity scores.

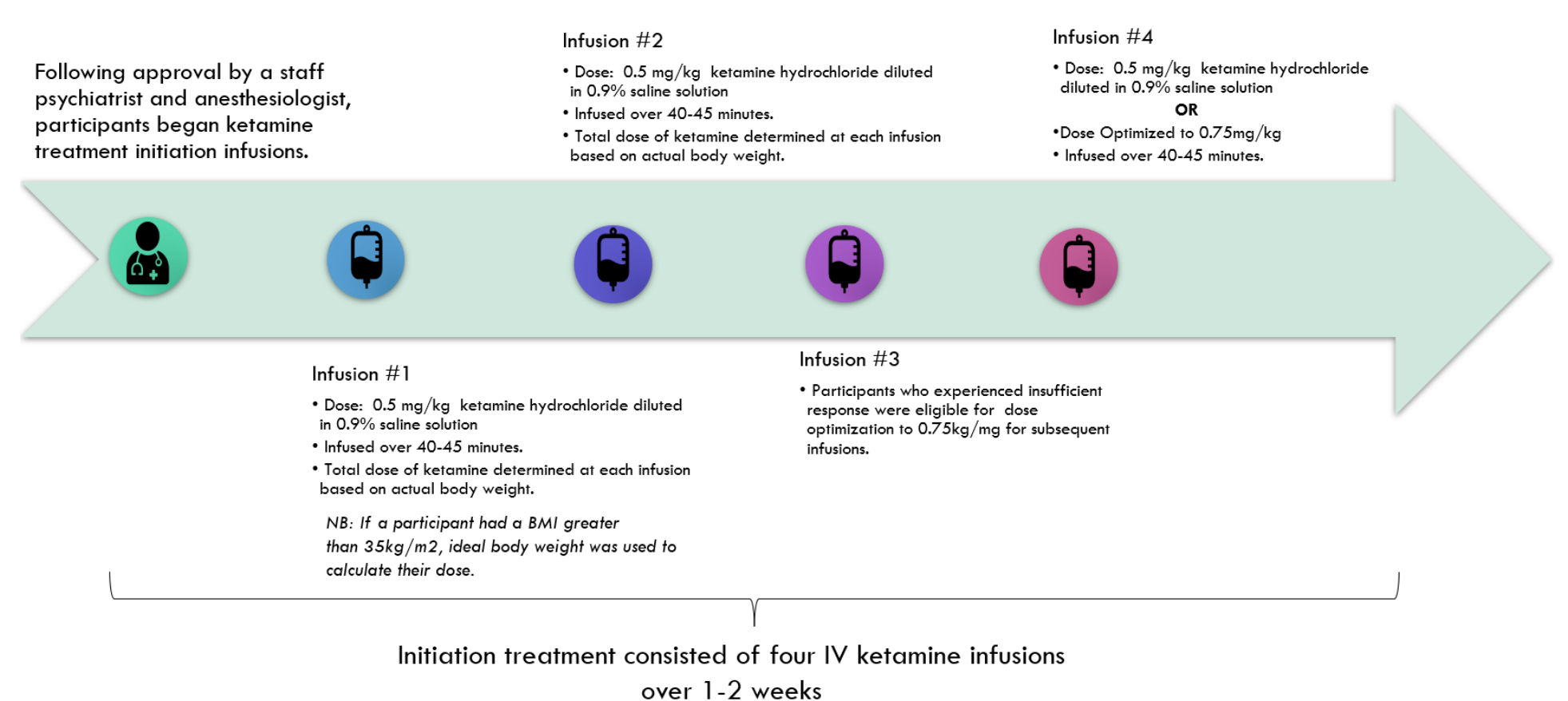


Unstandardized regression coefficients for the relationship between number of infusions and (A) QIDS-SR16 Total Score, (B) QIDS-SR16 SI Score, and (C) GAD-7 Total Score, as mediated by SHAPS Total Score. \*\*\* indicates significant associations at  $p < 0.001$ .

## Methodology

- This retrospective, post-hoc analysis included 203 ( $\bar{x} = 45 \pm 14.6$  years of age) patients ( $\geq 18$ ) receiving four infusions of intravenous (IV) ketamine at the Canadian Rapid Treatment Center of Excellence (CRTCE).
- The primary outcome measure: change in anhedonia severity, as measured by the Snaith–Hamilton Pleasure Scale (SHAPS).
- Secondary measures sought to determine if improvement on the SHAPS mediated the effect of repeated IV ketamine infusions on symptoms of depression and suicidal ideations, as measured by the Quick Inventory for Depression Symptomatology-Self Report 16-Item (QIDS-SR16) & anxiety, as measured using the Generalized Anxiety Disorder-7 (GAD-7).
- The CRTCE specializes in providing IV ketamine treatment to individuals with TRD in the community.
  - Patients receiving treatment must be experiencing a Major Depressive Episode and meet criteria for Stage 2 Resistance (i.e., failure of at least one adequate trial of antidepressant monotherapy plus failure of an adequate trial using a different antidepressant class)

### Intravenous (IV) Ketamine Infusion Schedule



## Discussion

- Intravenous ketamine infusions were effective in improving measures of anhedonia in this large, community-based sample of adults with TRD.
- Improvements in anhedonia was noted to partially mediate the significant improvement in depressive symptoms, suicidality, and anxiety.
- The benefits observed in our sample on measures of anhedonia & suicidality are consistent with previous reports [2].
- We are of the view that the patients enrolled herein are highly representative of adults with TRD that are commonly encountered in clinical practice.
- Future research should attempt to parse the central nervous system substrates that subserve improvements in anhedonia in adults with TRD.

## Acknowledgement

This research has been conducted with the support of the Canadian Rapid Treatment Center of Excellence.

## References

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# Can the Positive and Negative Affect Schedule (PANAS) be used to predict vulnerability to psychological distress in medical students?

Hannah Margolis, Samantha Jaco  
Supervisor: Professor Di Eley

## Introduction

- Medical students experience a higher prevalence of anxiety and depression compared to the general population (1)
- The Positive and Negative Affect Schedule (PANAS) is a self-reported psychometric scale used to assess subjective emotional well-being (2)
- High positive affectivity is a state of high energy, full concentration and pleasurable engagement (2)
- High negative affectivity describes subjective distress and unpleasurable engagement (2)
- There is a gap in the literature regarding the use of PANAS to evaluate medical student vulnerability to psychological distress

## Aims

1. Determine if PANAS scores are associated with traits of depression, anxiety and stress
2. Develop profiles of medical students based on PANAS scores
3. Distinguish the PANAS profiles by corresponding each to levels of depression, anxiety and stress

## Methods

**Participants:** First year University of Queensland medical students (n = 376)

**Data collection:** participants completed a questionnaire consisting of PANAS and Depression Anxiety Stress Scale (DASS)

**Data analysis:** Pearson correlations (2-tailed,  $p > 0.01$ ) provided associations between PANAS and DASS measures. A 2-Step Cluster analysis identified PANAS profiles.

## Results

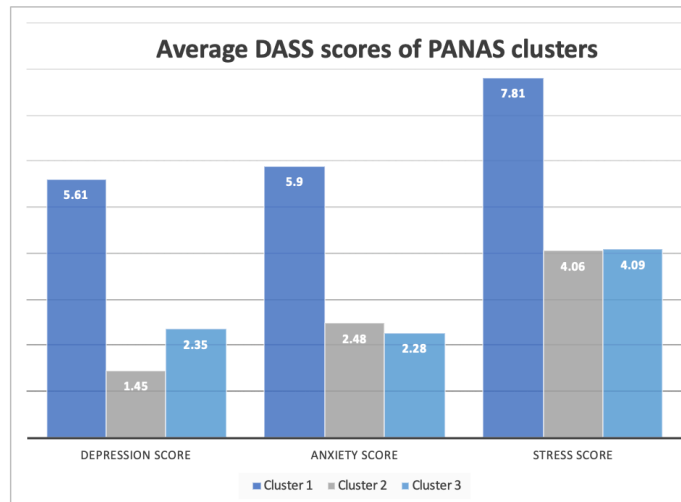
Mean levels of PANAS positive affectivity (PA) and negative affectivity (NA) were consistent with previous general student population studies

	Positive affectivity		Negative affectivity	
DASS Depression	Not significant	-0.270	Significant	0.506
DASS Anxiety		-0.033		0.605
DASS Stress		-0.074		0.548

**Table 1. Correlation between DASS and PANAS.** PANAS NA was significantly correlated with DASS Depression ( $r=.506$ ), anxiety ( $r=.604$ ) and stress ( $r=0.508$ )

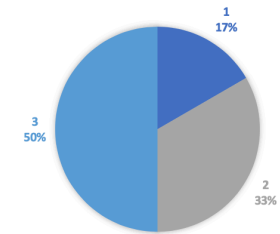
Clusters	1	2	3
Negative affectivity	23.36	14.82	12.59
Positive affectivity	31.25	40.27	25.09

**Table 2. Mean negative affectivity and mean positive affectivity in each PANAS cluster.** Cluster 1 has highest NA and Cluster 2 has highest PA.



**Figure 1. Average DASS scores of each PANAS Cluster.** Cluster 1 had the highest depression, anxiety and stress scores. Cluster 2 had the lowest depression and stress scores. Cluster 3 had the lowest anxiety scores

**Proportions of cohort in each PANAS cluster**



**Figure 2. Cohort percentages in each PANAS cluster**

## Conclusions

- This study identified three distinct clusters of PANAS scores in medical students. Each is distinguished by corresponding levels of depression, anxiety and stress.
- Students in Cluster 2 may have better emotional well-being
- Cluster 1 may be most vulnerable to developing psychological distress. Individuals in Cluster 1 may benefit from targeted emotional support throughout medical school

## Future Research

- Repeat the questionnaires with the same participants in their fourth year of study to determine if results remain consistent throughout medical school
- Explore the association between PANAS clusters and additional psychological measures such as the Temperament and Character Index or the Resilience Scale

References: (1) Bore M, Kelly B, Nair B. Potential predictors of psychological distress and well-being in medical students: a cross-sectional pilot study. *Adv Med Educ Pract.* 2016;7:125-35

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## Introduction

- Emergency Departments (ED) require rapid decision making in a complex environment where there is incomplete information and unclear goals. Emergency medicine demands effective team coordination in order to achieve tasks efficaciously in an organised and time-critical manner.<sup>1</sup>
- Simulation based education is used to practice clinical skills and critical judgements required to manage clinical presentations in ED.<sup>2</sup>
- However, simulation-induced anxiety (SIA) can impair performance and disrupt learning.<sup>3</sup> In-situ/post-simulation debriefing allows learners to interrogate their cognitive and emotional responses to scenarios, reflecting on these with feedback to develop new approaches for future scenarios.<sup>4</sup>

## Objective

- To review available evidence on different methods of debriefing and their effectiveness in reducing SIA in the ED.

## Methods

A systematic integrative review was undertaken searching the following databases (1990-Aug 2020): CINAHL, Cochrane, Embase, Medline and PubMed, as well as Health Sciences and Google Scholar for grey literature.

Search strategy using keywords “emergency department”, “simulation”, “training”, “debriefing” and “anxiety” was used to identify relevant studies.

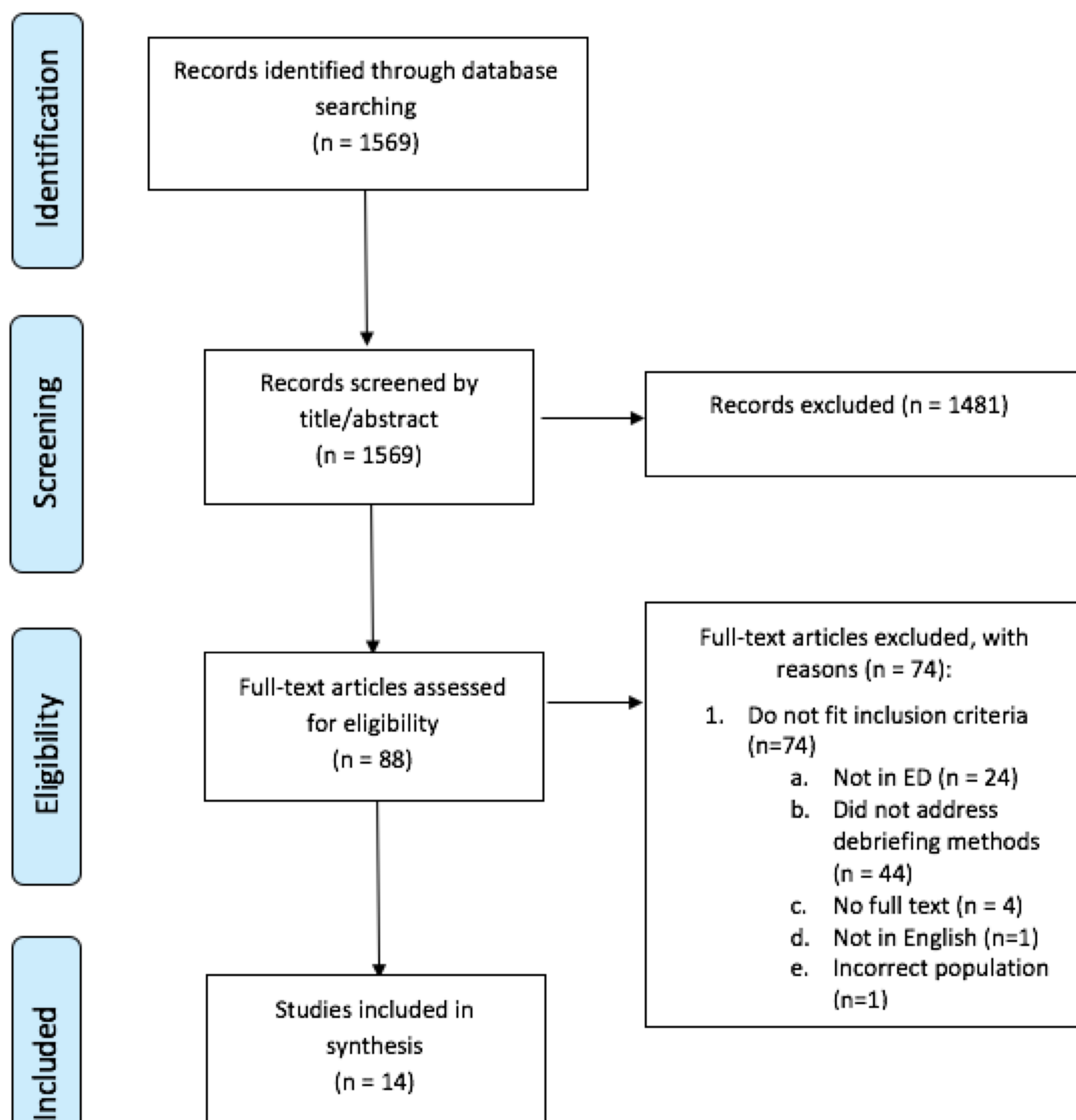


Figure 1: Preferred reporting items for meta-analysis and systematic reviews (PRISMA) flow chart of literature search

## Results

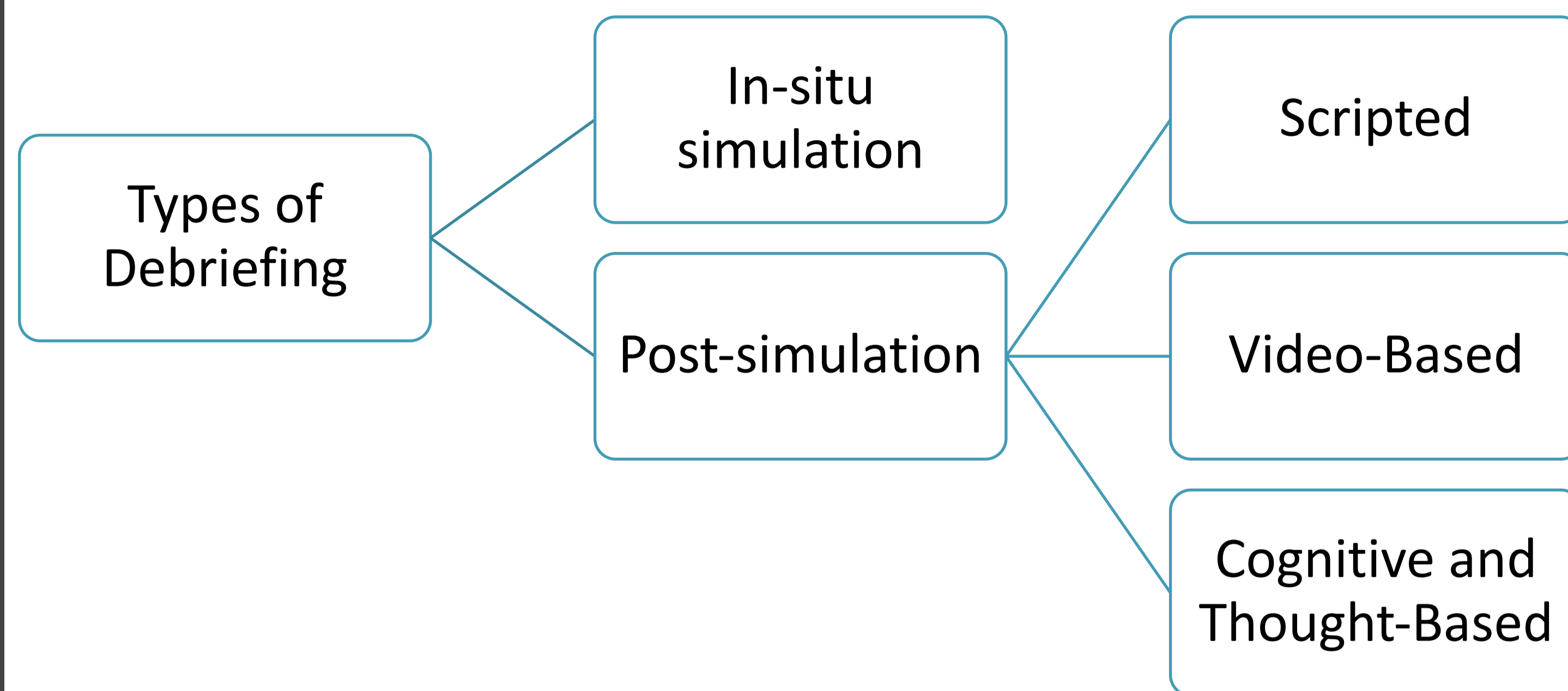


Figure 2: Types of debriefing methods identified in the review.

- A total of 14 studies addressed the research question.
  - 11 studies were published in the United States of America and two were published in Australia and 1 study was published in Belgium.
- Amongst the different types of debriefing (Figure 2), in-situ simulation debriefing and video-based post-simulation debriefing methods have been found to be effective in reducing SIA in the ED.

## Discussion

In-situ simulation debriefing and post-simulation debriefing, particularly video-based debriefing, where video recordings of the simulation guide face-to-face debriefing contribute to enhanced confidence and reduced levels of SIA in the ED

This review identified a paucity of research examining debriefing methods directly addressing SIA in the ED

The role of simulation and debriefing within the ED is highly relevant now during the era of COVID-19 pandemic with a critical requirement for coordinated teamwork

## Limitations & Recommendations

- Full description of the simulation procedure or clear structure of the debriefing method were not provided.
- Heterogeneity in the samples were inconsistent to make a comparison.
- Future research should focus on use of standardised measurement tools to measure effect of debriefing on SIA in the ED.

## Acknowledgement & References

The authors would like to thank Dr. Odhran Keating, Dr. Hansel Addae and Ms. Julie Humphries for their contribution to this project.

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## Introduction

- Dementia is the leading cause of disability among older Australians, accounting for nearly 17% of their disability burden<sup>1</sup> and is projected to become the third greatest source of health and aged care spending within two decades<sup>2</sup>.
- Approximately 90% of older people with dementia in residential aged care facilities (RACFs) will experience behavioural and psychological symptoms of dementia (BPSD) at some time during the course of this syndrome<sup>3</sup>.
- Studies supporting the effectiveness of antipsychotic medication in modifying BPSD are limited<sup>4</sup>.
- Safe alternative treatments for BPSD are required, especially non-pharmacological strategies<sup>4</sup>.

## Objective

- To determine the effect of an aquatic exercise program, the Watermemories Swimming Club (WSC), on behavioural, psychological, and physical wellbeing of community dwelling people with dementia and their family carers.

## Methods

Participants with dementia, with at least one BPSD, participated in the WSC twice a week for 12 weeks.

Baseline: Psychological Well-Being in Cognitively Impaired Persons (PW-BCIP) and the Revised Memory and Behaviour Problems Checklist (RMBPC); for their family carer, the General Health Questionnaire (GHQ) and the Caregiver Hassles Scale (CHS).

The dyad was assessed again after completion of the 12-week program and scores compared to baseline.

## Results

Six participants and their family carers, were enrolled and five dyads completed the trial (mean age of person with dementia: 71.8 years (SD 12.83)).

Of the six participants, 2 were females and 4 were males. One dropped out due to ill health.

A trend towards improvement in revised memory and behaviour reaction was observed, but not in psychological well-being.

Family carers did not show positive trends for general health or carer burden.

## Discussion

### Feasibility

- Aquatic exercises may be a non-pharmacological treatment option for individuals with BPSD.
- A trend towards improvement in RMBP.

### Evidence

- Benefit of weekly aquatic exercises for older people with dementia living in RACFs with positive trends in BPSDs activities of daily living, and a few other psychosocial measures such as RMBP<sup>5</sup>.

### Outcome

- Dementia poses hindrance to social networks and institutional environments along with rising costs of care and greater degree of burden for carers<sup>6</sup>.
- Outcomes are positive in light of the current management of dementia patients.

## Limitations & Recommendations

- The main limitation of this study is the small sample size of 6 participants completing the study.
  - This enlightens the challenges associated with recruitment in the aged-care cohort thus implying that more work is needed to recruit sufficient eligible participants.
- There were no adverse incidents experienced by the participants, which supports the future potential to expand this treatment option to larger populations with dementia.
- Future studies should consider increasing the number of aquatic sessions over a longer length of time to see if the benefit of the treatment can be sustained longer than in this study.
- Future research including measures of fitness and function to investigate healthy aging and fitness levels.

## Acknowledgment

- Funding from Nursing and Midwifery Research Fellowship, Queensland Government "The Watermemories Swimming Club for people with dementia" (Neville, C., Beattie, E.)

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