
**Randomised Controlled trial of chewing gum to relieve thirst
in Chronic Heart Failure**

(RELIEVE- CHF) Pilot Study

Chewing gum: a potential strategy to relieve thirst in chronic heart failure

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This thesis is presented in fulfilment of the Degree of Doctor of Philosophy

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CERTIFICATE OF ORIGINAL AUTHORSHIP

I certify that the work in this thesis has not previously been submitted for a degree nor has it been submitted as part of requirements for a degree except as part of the collaborative doctoral degree and/or fully acknowledged within the text.

I also certify that the thesis has been written by me. Any help that I have received in my research work and the preparation of the thesis itself has been acknowledged. In addition, I certify that all information sources and literature used are indicated in the thesis.

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LIST OF ACRONYMS AND ABBREVIATIONS IN THIS THESIS

Abbreviation	Full term
ACE	Angiotensin-Converting Enzyme
ACEIs	Angiotensin-Converting Enzyme Inhibitors
ACNC	Australian Cardiovascular Nursing College
AKPS	Australian-modified Karnofsky Performance Scale
ARBs	Angiotensin Receptor Blockers
CCI	Charlson Comorbidity Index
CCU	Coronary Care Unit
CHF	Chronic Heart Failure
CI	Confidence Interval
CINAHL	Cumulative Index to Nursing and Allied Health Literature
CSANZ	Cardiac Society of Australia and New Zealand
DBP	Diastolic Blood Pressure
eGFR	Estimated Glomerular Filtration Rate
HF	Heart Failure
HRQoL	Health-related quality of life
KCCQ	Kansas City Cardiomyopathy Questionnaire
LVEF	Left Ventricular Ejection Fraction
NRS	Numeric Rating Scale
NYHA	New York Heart Association Classification
RCT	Randomised Controlled Trial
SBP	Systolic Blood Pressure
SD	Standard Deviation
SPSS	Statistical Package for the Social Sciences
TIA	Transient Ischaemic Attack
VAS	Visual Analogue Scale

ABSTRACT

Thirst is a common and burdensome symptom of chronic heart failure which adversely affects health related quality of life and compliance to self-care practices such as fluid restriction. Despite this, research on thirst remains scarce and there is no standard approach to identify patients with increased thirst and manage thirst in clinical practice. To date, previous studies have investigated various interventions to help alleviate thirst in chronic heart failure and other patient populations. While the other interventions such as artificial saliva showed differing results, chewing gum demonstrated promising outcomes in relieving thirst. Based on the comprehensive literature review and preliminary Bachelor Honours study, RELIEVE-CHF was developed. RELIEVE-CHF was a novel pilot intervention which sought to investigate the effect of chewing gum in the level of thirst of people with chronic heart failure in a single blind randomised controlled study.

A total of 71 individuals with chronic heart failure, aged ≥ 18 years, on oral loop diuretics from the inpatient and outpatient clinic were enrolled in a two-arm trial. Participants were randomised to receive either chewing gum or no chewing gum for two weeks. The primary outcome of the study is the change in the level of thirst at Day 4. Secondary outcomes included changes in the level of thirst at Day 14, weight and health related quality of life. Participants' level of thirst was measured using the Visual Analogue Scale (VAS) and the Numeric Rating Scale (NRS). The Kansas City Cardiomyopathy Questionnaire was used to assess health related quality of life. Participants were followed up at Day 28.

This thesis presents the clinical trial methodology and analysis of 71 participants who completed the trial. All participants' data were analysed based on the intention to treat

principle. The results showed statistical significant improvements in the level of thirst of those in the intervention group compared to the control group at Day 4 (VAS: $p=0.04$ and NRS: $p=0.019$) and Day 14 (VAS: $p=0.02$ and NRS: $p=0.021$). There was no statistically significant difference observed between the intervention and control group in weight over the study period and health related quality of life at Day 28. The findings indicate that chewing gum provided relief from thirst but did not influence weight or health related quality of life during the study period. Although promising, these findings must be interpreted in light of the limitations encountered in this trial. Nonetheless, RELIEVE-CHF have provided additional data to inform future clinical intervention studies and insights into the challenge of implementing a non-traditional approach in relieving thirst in people with chronic heart failure.