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The impact of adverse childhood experiences on sensation and pain in people living with multiple long-term health conditions and chronic pain

Submission date
25/06/2024

Recruitment status
No longer recruiting

Registration date
03/07/2024

Overall study status
Completed

Last Edited
10/11/2025

Condition category
Signs and Symptoms

[X] Prospectively registered
[X] Protocol
[_] Statistical analysis plan
[_] Results
[_] Individual participant data
[X] Record updated in last year

Plain English summary of protocol

Background and study aims
Some people experience negative or adverse childhood experiences (ACEs) when growing up. These people often have health problems in adulthood, including chronic pain. The body builds a pain-relieving system that helps reduce pain. The study team are researching whether ACEs alter how that inbuilt pain-relieving system works.

Who can participate?
Patients aged 18 years and older with chronic pain with and without multimorbidity and multimorbidity without chronic pain, plus healthy volunteer controls; participants do not need to have a history of ACEs

What does it involve?
Participants will be asked to attend one 3-hour session at Ninewells Hospital in Dundee. They will complete a consent form and some questionnaires (including on ACEs). Tests of their sensations (like temperature, light touch, and pin-prick) will also be undertaken. One of the tests involves putting their hand in cold water. The tests are designed to test normal or mildly painful sensations. They do not test the maximum amount of pain the participant can tolerate.

What are the possible benefits and risks of participating?
Taking part in the study might not benefit the participant directly, but it is hoped that it will aid the understanding of how ACEs influence long-term health. These data may help convince doctors and other healthcare professionals to consider ACEs when dealing with their patients (something called “trauma-informed healthcare”). It may also identify whether people with ACEs need different types of pain-relieving treatment. Participants will receive a gift card for taking part and will their travel expenses reimbursed.

What are the risks of taking part?
ACEs are a sensitive subject, and not everyone feels comfortable talking about them. It is

possible that taking part in this study may trigger unpleasant thoughts or memories. The study aims to be as sensitive as possible when collecting this information and to be considerate of our participants' experiences. Participants do not have to share this information if they prefer not to, and they can stop taking part in the study at any time. A member of the research team will be on hand for the entire session to provide immediate support, and participants will be provided with contact details for organisations that can provide further support beyond the session. Participants will also be encouraged to bring along a study partner for support if they feel it will help them feel more comfortable.

Where is the study run from?
The University of Dundee, UK
The study visits will take place at the Ninewells Hospital & Medical School campus of the University of Dundee, UK

When is the study starting and how long is it expected to run for?
December 2023 to February 2025

Who is funding the study?
The Wellcome Trust, through the Multimorbidity Doctoral Training Programme for Health Professionals

Who is the main contact?
Dr Dhan Senaratne, ACE-MAPStudy@dundee.ac.uk
The Chief Investigator is Prof Lesley Colvin

Contact information

Type(s)
Public, Scientific

Contact name
Dr Dhaneesha Senaratne

ORCID ID
https://orcid.org/0000-0003-3229-4632

Contact details
Chronic Pain Research Group, University of Dundee
Dundee
United Kingdom
DD1 9SY
+44 (0)1382385374
dsenaratne002@dundee.ac.uk

Type(s)
Principal investigator

Contact name
Prof Lesley Colvin

ORCID ID

https://orcid.org/0000-0002-1563-8600

Contact details
Chronic Pain Research Group, University of Dundee
Dundee
United Kingdom
DD1 9SY
None provided
l.a.colvin@dundee.ac.uk

Additional identifiers

Clinical Trials Information System (CTIS)
Nil known

Integrated Research Application System (IRAS)
337622

ClinicalTrials.gov (NCT)
Nil known

Protocol serial number
Wellcome Trust grant number 223499/Z/21/Z, protocol 2-007-24, IRAS 337622, CPMS 61937

Study information

Scientific Title
The impact of Adverse Childhood Experiences on sensory thresholds in adults living with Multimorbidity And chronic Pain; a feasibility study (the ACE-MAP study)

Acronym
ACE-MAP

Study objectives
Adverse childhood experiences (ACEs) are associated with lowered thresholds in quantitative sensory testing (QST) and conditioned pain modulation (CPM) testing regimes (i.e. experience of pain with milder stimuli) in adulthood, and this association is stronger in adults with a history of multimorbidity and/or chronic pain.

Ethics approval required
Ethics approval required

Ethics approval(s)
approved 09/05/2024, Scotland B Research Ethics Committee (Research Ethics Service, 2nd Floor Waverley Gate, 2-4 Waterloo Place, Edinburgh, EH1 3EG, United Kingdom; +44 (0)7814609032; manx.neill@nhslothian.scot.nhs.uk), ref: 24/SS/0031

Study design
Single-site feasibility study with a cross-sectional design

Primary study design
Observational

Study type(s)
Other

Health condition(s) or problem(s) studied
Multimorbidity and chronic pain

Interventions
The primary aim of the ACE-MAP study is to assess the feasibility and acceptability of the proposed study procedures. The secondary aim is to generate preliminary data to understand the impact of ACEs on QST and CPM parameters in people with multimorbidity and/or chronic pain.

Potential participants will be provided with a participant information sheet by email or post (depending on participant preference) before attending their assessment session. They will be given at least 24 hours to consider their participation and will have the opportunity to ask questions (via email or telephone) before the session.

Written informed consent will be obtained at the start of the assessment session, before the completion of any study assessments.

Next, participants will be asked to complete a series of questionnaires on:
• Demographics, including year of birth, sex assigned at birth, ethnicity, recruitment stream, Scottish Index of Multiple Deprivation (SMID), level of education, employment status, and household income;
• Health behaviours, using the General Practice Physical Activity Questionnaire (GPPAQ) and the World Health Organization's Alcohol, Smoking, and Substance Involvement Screening Test (ASSIST);
• Long-term conditions;
• Chronic pain, using the CAPE pain questionnaire (in the final stages of development);
• Adverse childhood experiences, using the CAPE ACE questionnaire (in the final stages of development);
• Medication.

Next will be the completion of physical measurements:
• Weight;
• Height;
• Quantitative sensory testing (QST) on each hand, including thermal thresholds, mechanical thresholds, vibration thresholds, pressure-pain thresholds, stimulus-response function, and wind-up ratio;
• Conditioned pain modulation (CPM) using the dominant hand for the test stimulus (heat pain threshold and pressure pain threshold) and the non-dominant hand for the conditioning stimulus (cold water bath at 10 C).

Finally, participants will be asked to complete a questionnaire on study acceptability, using a questionnaire

There is no planned follow-up for this study.

Intervention Type
Other

Primary outcome(s)
1. Recruitment feasibility measured per stream by calculating the overall recruitment rate (number of participants successfully recruited to the study per week) and the recruitment proportion (number of participants successfully recruited to the study divided by the number of potential participants approached) using study records at the end of the study
2. Acceptability measured using a modified version of an acceptability questionnaire administered to study participants at the end of the assessment session. The data will be presented as counts and proportions, with free-text comments presented as either themes or original anonymised quotes.

Key secondary outcome(s))
The following outcome variables are collected at the assessment session:
1. Demographics measured using questionnaires
2. Long-term conditions measured using questionnaires
3. Chronic pain measured using the CAPE pain questionnaire
4. Adverse childhood experiences (ACEs) measured using the CAPE ACE questionnaire
5. Medication measured using questionnaires
6. Quantitative sensory testing (QST) on each hand, including thermal thresholds, mechanical thresholds, vibration thresholds, pressure-pain thresholds, stimulus-response function, and wind-up ratio
7. Conditioned pain modulation (CPM) using the dominant hand for the test stimulus (heat pain threshold and pressure pain threshold) and the non-dominant hand for the conditioning stimulus (cold water bath at 10 C)

Completion date
12/02/2025

Eligibility

Key inclusion criteria
Four groups of participants aged ≥18 years old are eligible for recruitment:
1. Chronic pain with multimorbidity
1.1. Has ≥1 of the LTCs listed below
1.2. Has a diagnosis of chronic pain AND/OR has had persistent or recurring pain lasting >3 months

2. Chronic pain without multimorbidity
2.1. Has a diagnosis of chronic pain AND/OR has had persistent or recurring pain lasting >3 months

3. Multimorbidity without chronic pain
3.1 Has ≥2 of the LTCs listed below

4. Healthy volunteer controls

List of long-term conditions (LTCs):
Cardiovascular disease: stroke, coronary artery disease, heart failure, peripheral artery disease, heart valve disorders, arrhythmia, venous thromboembolic disease, aneurysm, hypertension (treated and untreated).

Metabolic and endocrine disease: diabetes, Addison's disease, cystic fibrosis, thyroid disorders.

Respiratory disease: chronic obstructive pulmonary disease, asthma, bronchiectasis.

Neurological disease: Parkinson's disease, epilepsy, multiple sclerosis, paralysis, transient ischaemic attack, peripheral neuropathy.

Cancer: solid organ cancers, haematological cancers, metastatic cancers, melanoma, benign cerebral tumours that cause disability.

Mental and behavioural disorder: dementia, schizophrenia, depression, anxiety, bipolar disorder, drug or alcohol misuse, eating disorder, autism, post-traumatic stress disorder.

Musculoskeletal disease: connective tissue disease, osteoarthritis, long-term musculoskeletal problems due to injury, osteoporosis, gout.

Digestive disease: chronic liver disease, inflammatory bowel disease, chronic pancreatic disease, peptic ulcer.

Urogenital disorder: chronic kidney disease, end-stage kidney disease, endometriosis, chronic urinary tract infection.

Haematological disorder: anaemia (including pernicious anaemia and sickle cell anaemia).

Eye disease: vision impairment that cannot be corrected.

Ear disease: a hearing impairment that cannot be corrected, Meniere's disease.

Infectious disease: human immunodeficiency virus (HIV) infection and acquired immunodeficiency syndrome (AIDS), chronic Lyme disease, tuberculosis, post-acute Covid-19.

Congenital disease: congenital disease or chromosomal abnormalities.

Participant type(s)
Healthy volunteer, Patient

Healthy volunteers allowed
No

Age group
Adult

Lower age limit
18 years

Sex
All

Total final enrolment
60

Key exclusion criteria
1. Unable to read or speak English to a sufficient standard to complete questionnaires or to follow instructions for sensory tests,
2. Lacks the capacity to consent to participate in the study
3. Chronic pain without multimorbidity: Has ≥1 of the LTCs
4. Multimorbidity without chronic pain: Has a diagnosis of chronic pain AND/OR has had persistent or recurring pain lasting >3 months
5. Controls: Has ≥2 of the LTCs; A diagnosis of chronic pain AND/OR has had persistent or recurring pain lasting >3 months

Date of first enrolment
14/07/2024

Date of final enrolment
12/02/2025

Locations

Countries of recruitment
United Kingdom

Scotland

Study participating centre
Ninewells Hospital
Ninewells Avenue
Dundee
United Kingdom
DD1 9SY

Sponsor information

Organisation
University of Dundee

ROR
https://ror.org/03h2bxq36

Funder(s)

Funder type
University/education

Funder Name
University of Dundee

Alternative Name(s)
Dundee University, Oilthigh Dhùn Dè

Funding Body Type
Government organisation

Funding Body Subtype
Universities (academic only)

Location
United Kingdom

Results and Publications

Individual participant data (IPD) sharing plan
The datasets generated during and/or analysed during the current study are not expected to be made available due to the highly sensitive nature of the subject material.

IPD sharing plan summary
Not expected to be made available

Study outputs

Output type	Details	Date created	Date added	Peer reviewed?	Patient-facing?
Protocol article		07/01/2025	10/01/2025	Yes	No
Participant information sheet	Participant information sheet	11/11/2025	11/11/2025	No	Yes
Study website	Study website	11/11/2025	11/11/2025	No	Yes