Leisure-time physical activity and chronic back disorders in Canadian adults: Results from a longitudinal population-based study

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2019 SRS Research Conference
Saskatoon, September 21, 2019
Background

Low back pain: The leading cause of years lived with a disability (YLD) from 1990 to 2017. in 126 out of the 195 countries in 2017.
Background

Chronic back disorders (CBD) definition:

CBD encompass a variety of pathologies and symptoms localized in the back including the thoracic, and lumbar spine, and pelvis with a duration of at least six months.

Prevalence in Canada (18-65 y.o.):
18.9% in 2007
17.8% in 2014

Bath et al., 2014.
Angarita-Fonseca et al., 2019
The Biopsychosocial Model

Social
Culture, social interactions

Psycho-
Illness behavior, beliefs, emotions, distress

Bio-
Neurophysiology
Physiologic dysfunction

Physical activity recommendations

- at least 150 min of moderate-intensity per week, or
- 75 min of vigorous-intensity physical activity per week, or
- any equivalent combination of the two

Guthold et al., 2018

Insufficient physical activity in Canada

Men 25.7% (19.7-32.8)  
Women 31.4% (24.1-39.7)
Relationship between physical activity and chronic back disorders

PA increases
- strength
- flexibility
- endurance
- blood circulation

Endogenous pain inhibition
- ↑ serotonine
- ↑ endogenous opioids

Traumatic physical contact
Repetitive motion - overuse

McGill & Callaghan, 1998
Mikkelsson, 2006
Yang et al., 2015
Gordon et al., 2016
Law et al., 2017
Lima et al., 2017
Gaps

- The relationship between PA and CBD over time is inconclusive.

- Lack of longitudinal studies

Heneweer et al., 2011
Hendrick et al., 2011
Steffens et al., 2016
Shiri et al., 2017
Objective

To investigate the associations between self-reported PA and the prevalence of CBD over time
Methodology

Data source

The National Population Health Survey
- Longitudinal
  16 years, 9 cycles, 1994/95 - 2010/11
- Nationally-representative survey
- Biennial
Target Population of the NPHS
17,276 persons 12 years of age or older were recruited in 1994/1995

Sample in the analysis
- Canadian adults, 18 years and above
- Representing 98-99% of Canadian adults over 18
Covariates (n=26): Age, gender, ethnicity, marital status, education, residence, province, working status, type of occupation, income, depression, distress, smoking, drinking, overall perceived health, number of comorbidities, allergies, arthritis, high blood pressure, migraine, asthma, body mass index (BMI), daily activity, cycle, CBD pattern response, season of reported PA
Statistical analysis

Generalized Estimating Equations (GEE)

A. Physical activity and CBD within the same cycle

B. Previous Physical activity and CBD in the subsequent cycle adjusted for previous CBD
Physical activity and CBD within the same cycle

Adjusted for:
- **Biological factors:** age, sex,
- **Social factors:** marital status, province, working status,
- **Psychological factors** depression, distress
- **Behavioural factors** drinking, smoking,
- **Other factors** perceived general health, number of comorbidities, allergies, arthritis, migraine, BMI
- **Methodological factors** cycle

![Graph showing odds ratios (OR) and 95% confidence intervals (CI) for different levels of physical activity and CBD use. The graph includes categories for LTPA (Light to Moderate Physical Activity) and CBD use (U Walking and U Cycling) across different time intervals (None, <1 hr/wk, 1-5 hr/wk, >5 hr/wk).](image)
Physical activity and CBD within the same cycle

Adjusted for:

Biological factors:
- age, sex

Social factors:
- marital status, province, working status,

Psychological factors
- depression, distress

Behavioural factors
- drinking, smoking

Other factors
- perceived general health, number of comorbidities, allergies, arthritis, migraine, BMI

Methodological factors
- cycle
Physical activity and CBD within the same cycle

Adjusted for:

**Biological factors:**
- age, sex

**Social factors:**
- marital status, province, working status,

**Psychological factors**
- depression, distress

**Behavioural factors**
- drinking, smoking

**Other factors**
- perceived general health, number of comorbidities, allergies, arthritis, migraine, BMI

**Methodological factors**
- cycle

BMI as a effect modifier of the relationship between utilitarian walking and CBD.
Previous Physical activity and CBD in the subsequent cycle

Adjusted for:

Biological factors:
- age, sex

Social factors:
- ethnicity, province, working status, type of occupation

Psychological factors:
- distress

Behavioural factors:
- smoking

Other factors:
- perceived general health, allergies, arthritis, migraine, BMI

Methodological factors:
- cycle
CONCLUSIONS
(based on preliminary analysis)

- Prior LTPA appears to be related to CBD, whereas current PA does not
- Tailored prevention and management of CBD should consider sex/gender differences
- ↓ CBD in pregnant women who walk as a mean of transportation
CONSIDERATIONS & NEXT STEPS

The NPHS

- Do not represent 100% of Canadians.
- There is no specific information regarding CBD such as location and type of problem.
- Not all possible confounders were collected.
- Subjective and variable measurement of PA.

Ongoing study of the relationship between directly measured PA and CBD (CHMS)

Future work exploring sex/gender differences.
The analysis presented in this paper was conducted at the Saskatchewan Research Data Centre (SKY-RDC) which is part of the Canadian Research Data Centre Network (CRDCN). The services and activities provided by the SKY-RDC are made possible by the financial or in-kind support of the SSHRC, the CIHR, the CFI, Statistics Canada, and University of Saskatchewan. The views expressed in this presentation do not necessarily represent the CRDCN’s or that of its partners.
Thank you
Target Population of the NPHS

17,276 persons 12 years of age or older were recruited in 1994/1995 and were followed-up until 2010/2011.

Sample in the analysis

Canadian adults aged between 18 and 65 years.

Representing 98-99% of Canadian adults aged 18 to 65 years.
Conclusions

Descriptive

Inferential

Alpha level: 0.05

The bootstrap method for robust variance estimation will be used