Factors associated with increased chronic pain among Canadian veterans: Insights from Life After Service Studies conducted in 2016 and 2019

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Background

- **Chronic pain:** persistent pain lasting for at least 3 months, considered a disease [1]

- **Impact:** reduced quality of life, potential mental health concerns, increased healthcare costs [2]

- **Prevalence:** 1 in 5 Canadian adults experience chronic pain [3]

- **Prevalence among veterans:**

    a) **LASS 2016:** 41.4%

    b) **LASS 2019:** 51.5%

- Reasons for the 10% increase in chronic pain among veterans, from 2016 to 2019, are uncertain

Objectives

Investigate factors associated with chronic pain and understand its distribution among Canadian veterans.

Methods

- **Design:** LASS cross-sectional survey by Statistics Canada

- **Participants**: Veterans from

  - LASS 2016: 3,002 participants

  - LASS 2019: 2,630 participants

- Sampling weights applied

- **Outcome:** Chronic pain (self-reported): "Are you usually free of pain or discomfort?" (Yes/No)

- **Covariates:** socio-demographics, lifestyle, and mental health factors

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Methods

- **Statistical Analysis:**

  o **Descriptive statistics:** participants' characteristics, chronic pain distribution

  o **Multivariable logistic regression**: factors associated with chronic pain

Characteristics of participants (selected)

Variables	LASS 2016 N = 56,413 (46.87%)[1]	LASS 2019 N = 63,948 (53.13%)[1]	p-value[2]
Age	**47.90** (11.69)	**50.05** (11.76)	<0.001
Sex			0.6
Male	49,529 (87.80%)	55,667 (87.21%)	
Female	6,885 (12.20%)	8,162 (12.79%)	
Education			0.012
University graduation	9,510 (17.24%)	11,376 (18.15%)	
High school graduation	23,322 (42.28%)	23,007 (36.71%)	
Less than high school graduation	2,294 (4.16%)	2,820 (4.50%)	
Post-secondary graduation	20,029 (36.31%)	25,473 (40.64%)	
Household income			0.5
< 50,000	771 (20.37%)	814 (16.43%)	
>= 50,000	3,013 (79.63%)	4,141 (83.57%)	
Military rank			>0.9
Regular Forces Junior	29,429 (52.17%)	33,465 (52.33%)	
Regular Forces Officer	9,768 (17.31%)	11,149 (17.43%)	
Regular Forces Senior	17,217 (30.52%)	19,334 (30.23%)	
Military environment			0.4
Sea	10,010 (17.74%)	10,420 (16.29%)	
Land	29,214 (51.79%)	33,052 (51.69%)	
Air	17,190 (30.47%)	20,476 (32.02%)	

[1]Mean (SD), n (%); [2]Wilcoxon rank-sum test for complex survey samples; chi-squared test with Rao & Scott's second-order correction

Comorbidities (selected)

Variables	LASS 2016 N = 56,413 (46.87%)[1]	LASS 2019 N = 63,948 (53.13%)[1]	p-value[2]
Pain	23,350 (**41.44%**)	32,802 (**51.51%**)	<0.001
Back problem	23,104 (**40.99%**)	29,181 (**45.79%**)	0.007
Arthritis	16,739 (**29.70%**)	22,503 (**35.41%**)	<0.001
High blood pressure	11,645 (**20.71%**)	15,791 (**24.82%**)	0.004
Anxiety	8,677 (**15.41%**)	13,929 (**21.83%**)	<0.001
Depression			0.011
A little of the time	9,993 (17.99%)	11,296 (17.92%)	
All the time	1,209 (2.18%)	1,917 (3.04%)	
Most of the time	4,600 (8.28%)	5,247 (8.32%)	
None of the time	31,091 (55.97%)	32,163 (51.02%)	
Some of the time	8,659 (15.59%)	12,414 (19.69%)	
PTSD	9,557 (**17.06%**)	15,534 (**24.67%**)	<0.001
Migraine	7,638 (**13.55%**)	11,017 (**17.27%**)	0.005
TBI effects	2,314 (**4.17%**)	4,240 (**6.77%**)	0.002
Cancer	1,420 (**2.52%**)	1,738 (**2.73%**)	0.7
COPD	1,462 (**3.14%**)	2,476 (**4.47%**)	0.067

[1]n (%); [2]Wilcoxon rank-sum test for complex survey samples; chi-squared test with Rao & Scott's second-order correction

Comparing chronic pain in longitudinal participants

- **LASS 2013:** 31%

- **LASS 2016:** 37%

- **LASS 2019:** 43%

Factors associated with chronic pain (selected)

Characteristic	OR[1]	95% CI[1]	p-value
Year			
LASS 2016	—	—	
LASS 2019	1.07	0.55, 2.08	0.8
Age			
<=50	—	—	
>50	3.66	1.29, 10.3	0.015
Sex			
Male	—	—	
Female	1.86	0.50, 6.95	0.4
BMI			
Normal weight	—	—	
Obese - class 1	3.78	1.48, 9.65	0.006
Obese - class 2	7.55	1.60, 35.7	0.011
Obese - class 3	1.47	0.04, 61.4	0.8
Underweight/Over weight	1.58	0.70, 3.58	0.3
Depression			
No	—	—	
Yes	2.62	1.24, 5.55	0.012
Anxiety			
No	—	—	
Yes	4.71	1.44, 15.4	0.011
PTSD			
No	—	—	
Yes	2.68	0.93, 7.72	0.068
Military rank			
Regular Forces Junior	—	—	
Regular Forces Officer	0.91	0.29, 2.87	0.9
Regular Forces Senior	1.15	0.45, 2.97	0.8
Military environment			
Sea	—	—	
Land	1.36	0.59, 3.14	0.5
Air	1.14	0.45, 2.84	0.8

[1] OR = Odds Ratio, CI = Confidence Interval

Limitations

- Reliance on self-reported data, susceptible to recall bias

- Lack of specificity in pain duration assessment (no explicit "at least 3 months" criterion), potentially overestimating chronic pain prevalence

- Incomplete data on important variables like smoking status, length of service, and release type, limiting comprehensiveness of findings

- Use of cross-sectional data, preventing establishment of causal relationships between chronic pain and associated risk factors

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Way forward/next steps

- Refine pain assessment question in future surveys to explicitly specify duration criteria (e.g., at least 3 months)

- Incorporate objective health measures (physical exams, biomarkers) for accurate chronic pain assessment

- Expand data collection scope (ethnicity, physical activity, nutrition, pain beliefs, violence exposure)

- Develop targeted, holistic interventions for veterans at risk, addressing pain management and associated conditions

- Analyzing longitudinal data to understand changes in chronic pain

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Conclusion

- Veterans with risk factors such as older age, obesity, depression, and anxiety are more susceptible to chronic pain.

- The rise in chronic pain prevalence among veterans from 2016 to 2019 may be attributed to a higher presence of these risk factors in the 2019 cohort, warranting further investigation and targeted interventions.

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