

A Prospective Study: Post Traumatic Headache, Fatigue, and Depression following Mild or Moderate Traumatic Brain Injury

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Prevalence of Headache, Fatigue, Depression Following TBI

- Traumatic brain injury (TBI) is the leading cause of death and disability for Canadians under 45¹
- **Headache and Fatigue are two of the most common complaints in patients with mild or moderate TBI.**²⁻³

Headache:

- 53.7% of patients who experienced a headache immediately following their injury were still symptomatic at 6 months post-injury.⁴
- 96% of patients who were symptomatic at 6 months post-injury were still symptomatic at 12 months post-injury.⁴

Fatigue:

- Two years post-TBI, 68% of patients continued to experience fatigue⁵
- Five years post-TBI, 73% of patients continued to experience fatigue⁵

Depression:

- 29% of patients with headaches following severe TBI suffered from depression⁶



¹ National Center for Injury Prevention and Control. Traumatic Brain Injury. *Centers for Disease Control and Prevention* [serial online] 2010

² Nicholson K, Martelli MF. The problem of pain. *J Head Trauma Rehabil* 2004;19(1):2-9.

³ A. Belmont, N. Agar, C. Hugeron, B. Gallais, p. Azouvi. Fatigue and Traumatic Brain Injury. *Annales de réadaptation et de médecine physique* 2006;49:370-374.

⁴ Walker, W. C., Seel, R. T., Curtiss, G., & Warden, D. L. (2005). Headache After Moderate and Severe Traumatic Brain Injury: A Longitudinal Analysis. *Arch Phys Med Rehabil*, 86, 1793-1800

⁵ Olver, J. H., Ponsford, J. L., & Curran, C. A. (1996). Outcome following traumatic brain injury: a comparison between 2 and 5 years after injury. *Brain Injury*, 10 (11), 841-848.

⁶ Formisano, R., Bivona, U., Catani, S., D'ippolito, M., & Buzzi, M. G. (2009). Post-traumatic headache: Facts and doubts. *The Journal of Headache and Pain*, 10(3), 145-52.

Objective

Patients suffering from the debilitating effects of headaches and fatigue may experience severe cognitive dysfunction, suffer mental health issues, have difficulty performing daily living activities, and a lowered quality of life.

The purpose of this study was to investigate the incidence and characteristics of headache, fatigue, and depression in patients who have sustained a mild or moderate TBI.



Methods

- A convenience sample of patients (n=179) who were at least 6 months post-TBI, attending St Michael's Hospital's Head Injury Clinic in Toronto, Ontario, were recruited.
- Participants' demographic, injury, and general health information were collected.
- The Rivermead Post Concussion Symptoms Questionnaire (RPQ)¹, Fatigue Severity Scale (FSS)², and Patient Health Questionnaire-9 (PHQ-9)³ were also collected.
- Participants who endorsed having headaches on the RPQ also completed a Headache Specific History⁴ and the Migraine Disability Assessment Tool (MIDAS)⁵.

¹King N, Crawford S, Wenden F, Moss N, Wade D. The Rivermead Post Concussion Symptoms Questionnaire: A measure of symptoms commonly experienced after head injury and its reliability. *Journal of Neurology*. 1995;242:587-592.

²Krupp LB, LaRocca NG, Muir-Nash J, Steinberg AD. The fatigue severity scale. Application to patients with multiple sclerosis and systemic lupus erythematosus. *Archives of Neurology*. 1989 Oct;46(10):1121-1123.

³Kroenke K, Spitzer RL, Williams JB. The PHQ-9: validity of a brief depression severity measure. *Journal of General Internal Medicine*. 2001;16(9):606-613.

⁴The Headache Specific History was developed by Neurologist and headache expert, Dr. Jonathan Gladstone. Dr. Gladstone, MD, FRCP is Director of Gladstone Headache Clinic; Director of Neurology and Headache Medicine, Cleveland Clinic Canada; Headache Specialist, Sunnybrook Health Sciences Center; Co-Director of Headache Clinic, the Hospital for Sick Children; and Headache/Neurology Specialist, Head and Neck Injury Clinic, Toronto Rehabilitation Institute.

⁵Stewart WF, Lipton RB, Dowson AJ, Sawyer J. Development and testing of the Migraine Disability Assessment (MIDAS) Questionnaire to assess headache-related disability. *Neurology*. 2001;56:S20-S28.

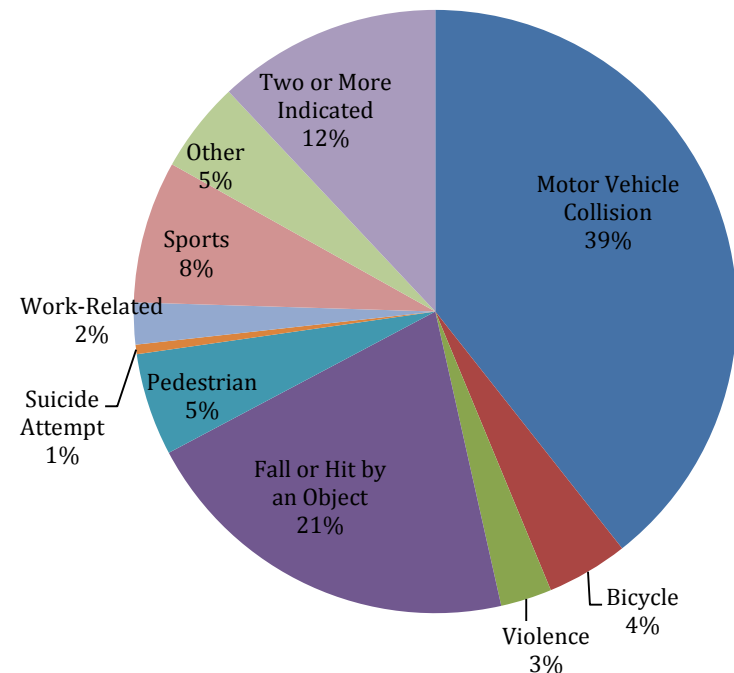


Demographic Results

- 179 patients were recruited to the study

Mechanism of Injury

Demographic Characteristic	Response
Age	43.7 ± 12.6 years [range 18-79]
Gender	49.2% [n=88] Male 49.2% [n=88] Female
Time Since Injury	35 months post-TBI [range 6 months-19 years]



Headache Results

❖ Based on the RPQ, 82.6% (n=148) indicated headaches to be a mild, moderate or severe problem.

❖ 86% (n=143) of participants had more than one location of headache pain.

❖ Top 5 Headache Triggers:

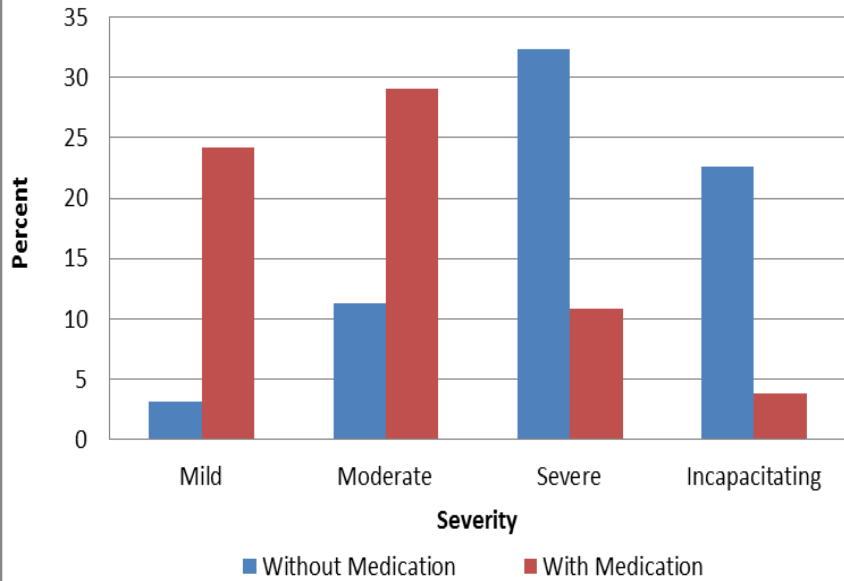
1. **Stress** (60.2% [n=112])
2. **Lack of sleep** (54.8% [n=102])
3. **Loud sounds** (51.6% [n=96])
4. **Bright lights** (51.1% [n=95])
5. **Fatigue** (47.3% [n=88])

❖ On a scale from 0-10 where 0 is no pain at all and 10 is pain as bad as it can be, most patients ranked their headaches, on average, at a **6.55**.

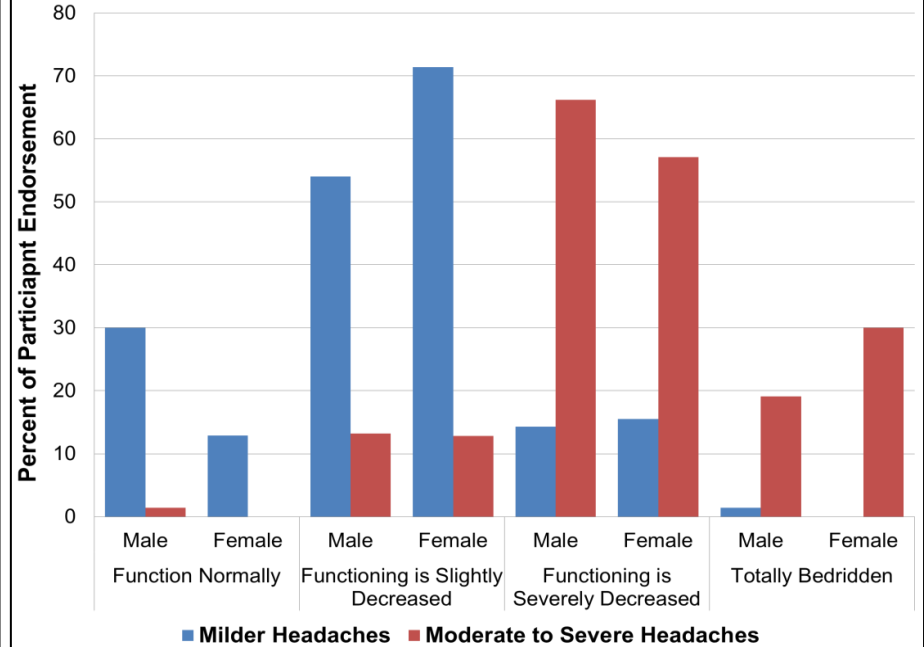


Headache Results

Severity of Headaches



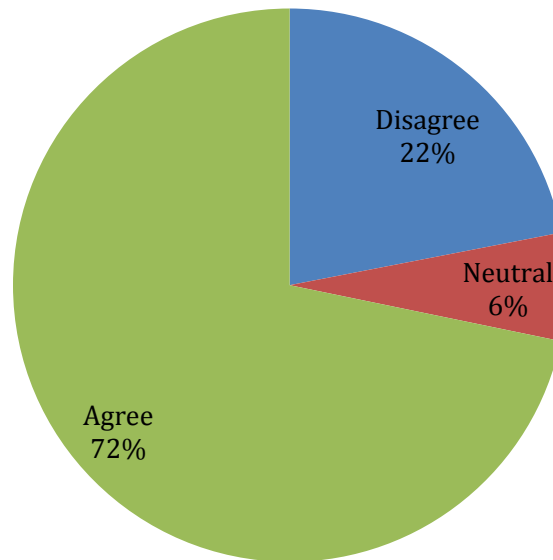
Ability to Function



Fatigue Results

- ❖ Based on the RPQ, 88.8% (n=159) indicated fatigue to be a mild, moderate or severe problem
- ❖ 80.4% (n=144) scored ≥ 36 on the FSS (suggesting the presence of fatigue)

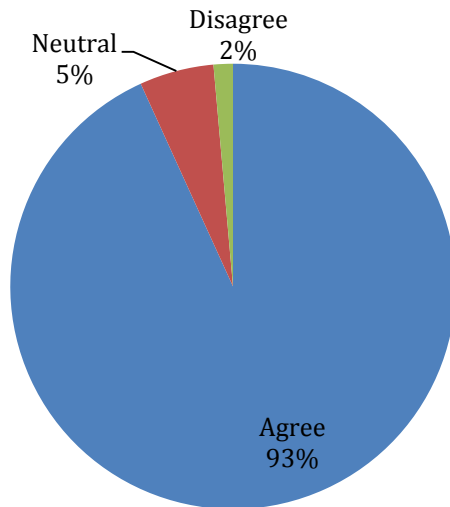
“Fatigue is One of my Three Most Disabling Symptoms”



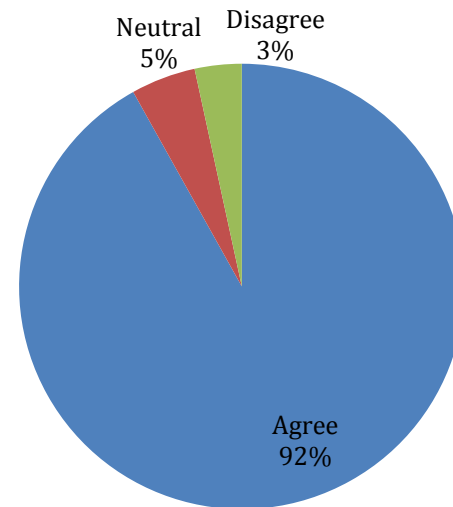
Fatigue Results

- ❖ Patients suffering from fatigue reported frequent problems sustaining motivation (93.2% [n=138]) and physical functioning (82.9% [n=121]).
- ❖ 89.8% (n=133) of patients reported that they were easily fatigued and 83.7% (n=124) of patients reported that fatigue causes them frequent problems.

“Fatigue Interferes with Carrying Out Certain Duties and Responsibilities”

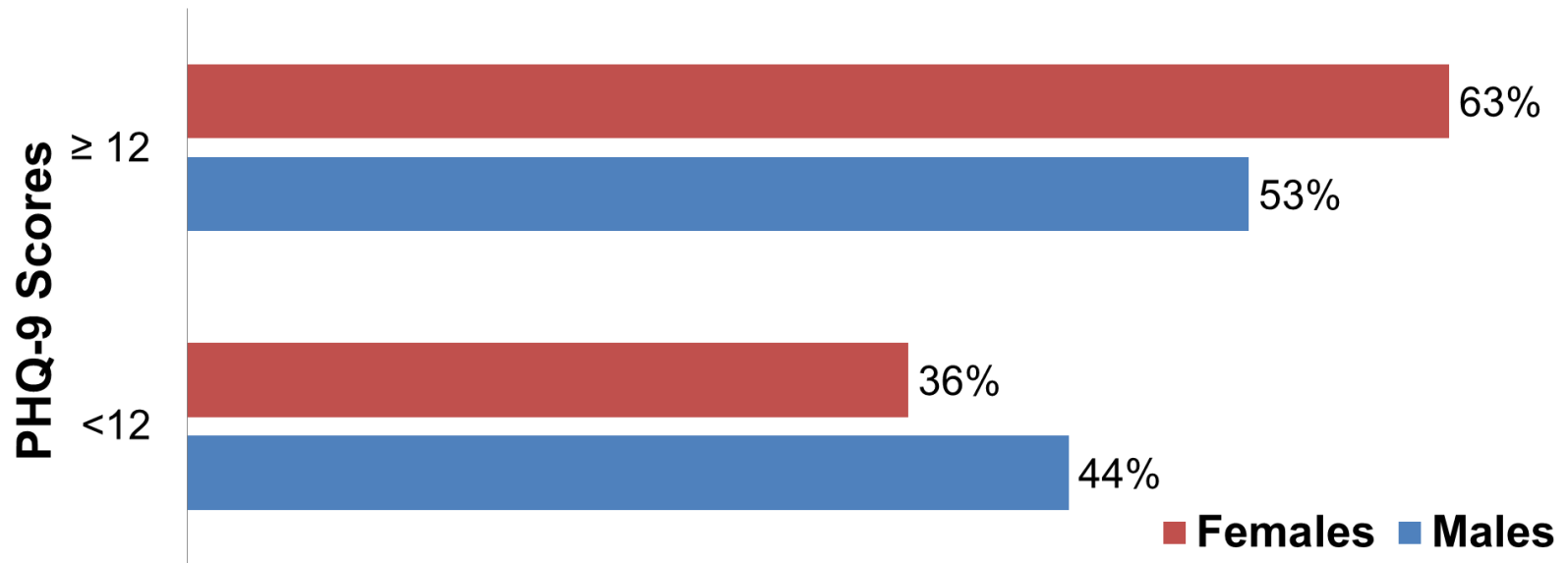


“Fatigue Interferes with my Work, Family or Social Life”



Depression Results

- Average PHQ-9 scores were **13.7 ± 6.7** for females, and **12.5 ± 6.9** for males
- PHQ-9 scores ≥ 10 indicate moderate depression



Kroenke, K., Spitzer, R. L., & Williams, J. B. W. (2001). The PHQ-9: Validity of a brief depression severity measure. *Journal of General Internal Medicine*, 16(9), 606-613.



Results

Fatigue scores as measured by the FSS correlated with patients suffering from headaches ($r = .247, p < .001$)

Patients with headaches were more likely to have a PHQ-9 score ≥ 12 (indicative of major depression in the population; $\chi^2(4, N = 169) = 18.085, p < 0.01$)

Only FSS scores were significantly different between the sexes ($t(170) = -2.17, p = 0.026$)



Conclusions

The majority of patients with mild to moderate TBI who presented to an outpatient TBI clinic report symptoms of headache, fatigue, and depression impacting quality of life and mental health.

A better understanding of factors (e.g. demographics, injury characteristics, medication compliance) leading to persisting headache and fatigue is warranted.

This high incidence of patients has confirmed the necessity to conduct large-scale trials to implement and evaluate interventions for the management of headaches in the TBI population.



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