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Introduction

- Bowel and bladder dysfunction have a major impact on the quality of life of SCI patients and have been identified as top priorities for recovery by individuals with SCI^{1,2}
- Management of SCI requires careful consideration of the sensory, motor, and autonomic consequences with proper bowel and bladder care being two critical components of long-term care^{3,4}
- This is a collaboration between two centers: the ICORD, University of British Columbia, in Canada and the Indian Spinal Injuries Centre in New Delhi, India
- These two countries vary in terms of population, GDP, development, and SCI incidence (Table 1)

Table 1. Comparison of population, economic, development, and SCI incidence in Canada and India

Variable Reference	Canada	India
Population - Worldbank (2020)	38,005,238	1,388,000,000
GDP (millions in USD) – Worldbank (2020)	1,644,037.29	2,660,245.29
Human Development index –United Nations (2020)	0.929 (Rank 16)	0.645 (Rank 131)
Incidence of SCI (Noonan et al., 2012 and Rehabilitation Council of India 1999)	3,174 cases/year	15,000 cases/year

Methods

- Demographic information include participants age, sex, level of injury, completion of injury and AIS grade were collected (Table 2)
- Participants completed four questionnaires including:
 - Neurogenic bowel dysfunction score (NBD) – evaluates the magnitude of bowel dysfunction with focus on constipation, fecal incontinence and perianal skin problems
 - Wexner Incontinence Score (WIS) – assesses type, frequency, and impact of fecal incontinence on daily life
 - Neurogenic bladder symptom Score (NBSS) – covers three domains including incontinence, storage and voiding, and consequences of dysfunction
 - Incontinence-QoL (I-QoL) – assesses impact of urinary incontinence symptoms on quality of life
- After reviewing the distribution of data, normally distributed data were compared using t-tests; data not normally distributed were compared using Mann-Whitney U tests
- For evaluation of association between categorical variables, Fisher's exact test or Chi-square was used (depending to sample size)
- A p-value of <0.05 was considered as significant. All statistical analyses were performed using IBM SPSS Statistics

Table 2. Participant Demographics

Demographic Variable	n (%) Canada	n (%) India
Number of participants	15	18
Age (Mean)	54.5	27.9
Male:Female Ratio	9:6	16:2
Years Since Injury	23.0	2.4
LOI (Cervical)	6(40.0%)	5(27.8%)
LOI (Thoracic)	7(46.7%)	10(55.6%)
LOI (Lumbar)	2(13.3%)	3(16.7%)
Complete	6(40.0%)	9(50.0%)
AIS (A)	6(42.9%)	9(50.0%)
AIS (B)	4(28.6%)	6(33.3%)
AIS (C)	2(14.3%)	2(11.1%)
AIS (D)	2(14.35%)	1(5.6%)
Missing AIS	1	0

Results

- Analysis demonstrated Canadian sample was older with increased years since injury
- Indian sample reported significant increased frequency of bowel movements (See Figure 1)
- Canadian sample scored significantly higher on NBD score (See Figure 2)
- Canadian participants were more likely to report uneasiness, headache, or perspiration during defecation
- The mean Wexner score for the Canadian sample was 7.5 (+/-4.5) and the mean for the Indian sample was 7.3 (+/-3.0) with no significant difference in distribution of scores between two samples
- There was no significant difference in the NBSS total score nor the three domain scores including incontinence, storage and voiding, and consequences
- A small but significant difference in QOL sub-scoring of the NBSS wherein Indian participants were more likely to be unhappy or unsatisfied with bladder function
- Analysis demonstrated no significant difference in distribution across countries for total I-QOL score and for the three subscales including avoidance and limiting behavior, psychosocial impacts, and social embarrassment

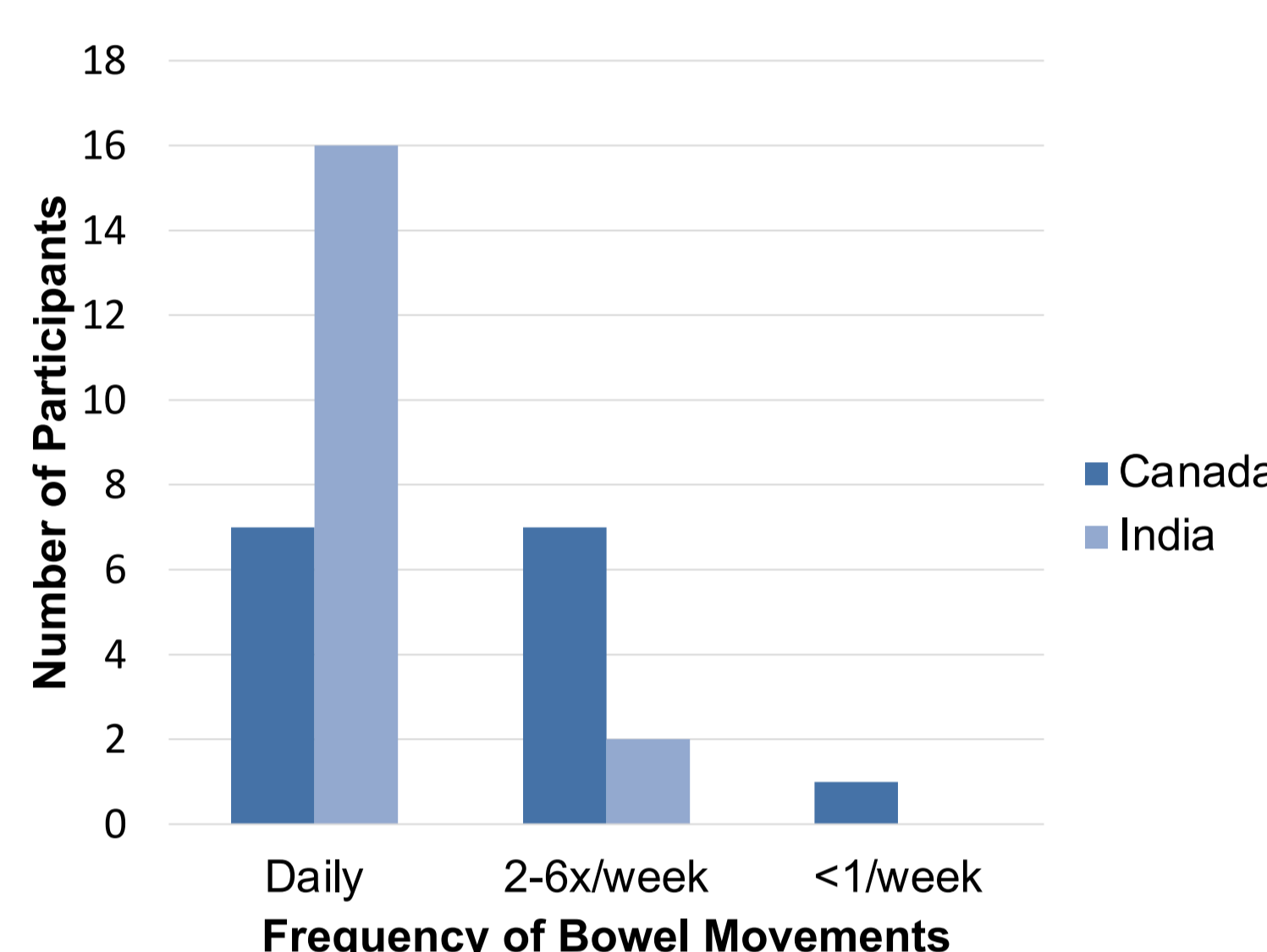


Figure 1. Country differences in frequency of bowel movements

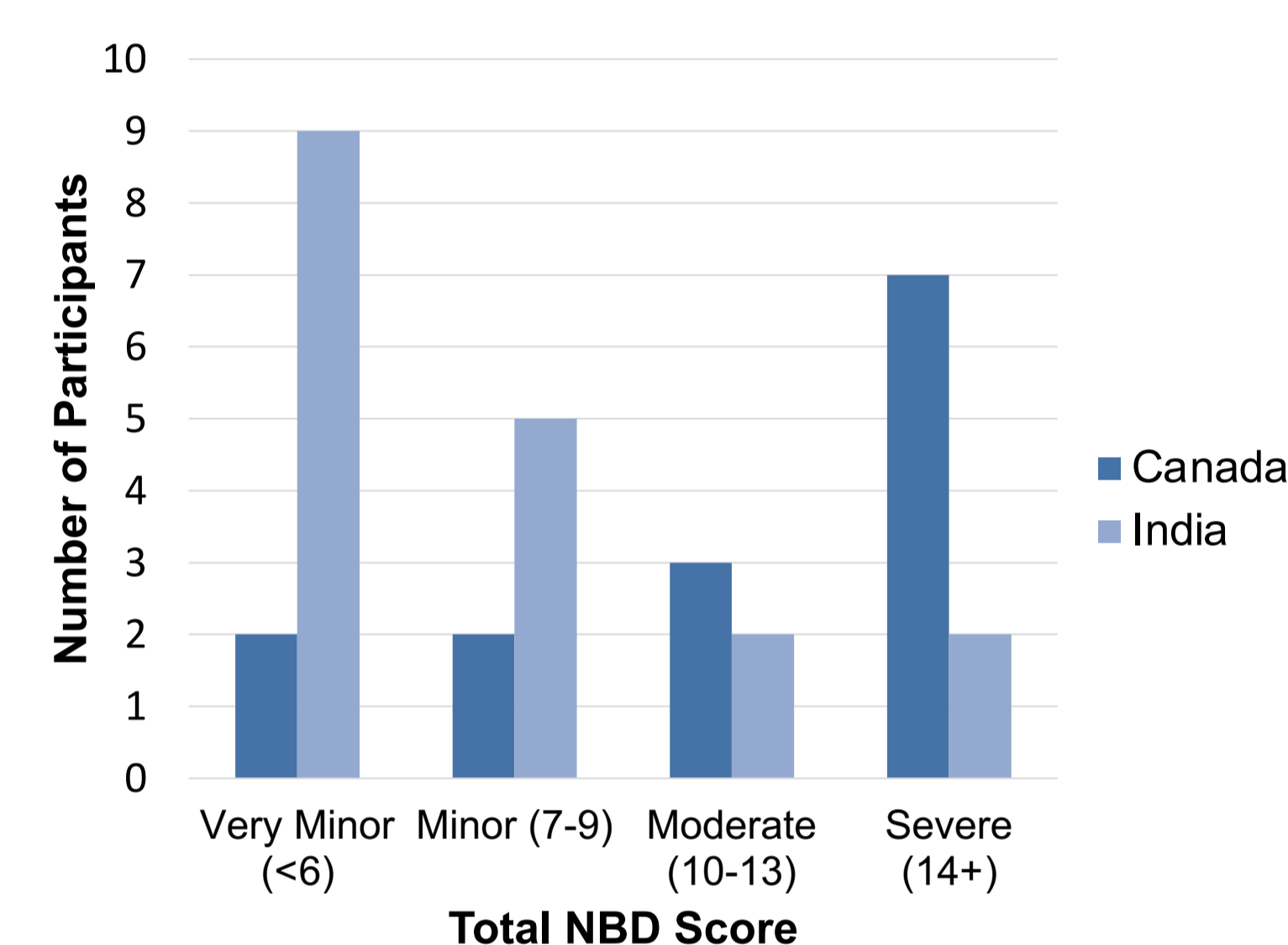


Figure 2. Country differences in total NBD score

Conclusion

- Comparing SCI patients from different countries allows for mutual learning and collaboration in understanding the range of practices that can improve patients' lives
- Canadian participants are experiencing mild constipation, which could be triggering symptoms of autonomic dysreflexia
- Potential explanations for findings include culturally diverse dietary practices, caregiver and patient education around intermittent catheterization, and social norms regarding self image
- Study limitations include restriction of generalizability to large, urban treatment centers, significant differences in age and years since injury, and unaccounted individual differences including level of income and education

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