COVID-19
Canada

THE END OF THE WORLD
AS WE KNOW IT?

RESEARCH REPORT N° 10

Sleeping patterns of Canadians during the COVID-19 pandemic

THIS RESEARCH REPORT IS INTENDED FOR POLICY MAKERS AND THE GENERAL PUBLIC

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Abstract

The global spread of the COVID-19 virus has impacted people's lives and well-being, increasing uncertainty, stress, anxiety, and psychological distress. Since sleep is one of the most important indicators of general health and well-being, we investigated sleep patterns during the COVID-19 pandemic to learn about Canadians' health. We used six sleep indicators: sleep quality, quantity, time awake, time to fall asleep, dream quality, and dreams related to COVID-19. The majority of Canadians reported having good sleep throughout the COVID-19 pandemic. However, a minority of individuals reported certain sleep disturbances.

Table 1. Definitions and measures of key concepts

Sleep indicators	Survey questions
Sleep quality	How would you describe the quality of your sleep during the last 24 hours? 1 = bad - 10 = good
Sleep quantity	How much sleep did you get in the last 24 hours? In hours and minutes
Time awake during the night	If you woke up during your sleep in the last 24 hours, about how long did you stay awake? In minutes
Time to fall asleep	How long did it take you to fall asleep when you went to bed? In minutes
Dream quality	If you can remember a dream from the last 24 hours, overall, was this dream positive or negative? 1 = very positive - 10 = very negative (nightmare)
Dream related to COVID-19	If you can remember a dream from the last 24 hours, to what extent did it refer to the COVID-19 crisis? 1 = not at all - 10 = extremely

Research questions

The COVID-19 pandemic has disrupted lives globally as governments implemented new public health recommendations and restrictions to limit the spread of the virus. In Canada, individuals were compelled to change their lifestyles as governments, private companies and schools closed or continued their activities online. These major changes in lifestyle paired with the uncertainties of a global pandemic generated an increase in psychological distress, such as an increase in anxious and depressive symptoms (Rajkumar, 2020, Xiong et al., 2020). Multiple factors such as lifestyle changes, anxiety, depression, psychological distress, and many more have had a major impact on individuals' sleeping patterns. The present report looks at how sleep patterns changed through the COVID-19 pandemic.

Hypotheses

We expect that the sample will be divided into several groups of individuals who have similar patterns on the sleep variables. Sleep will be investigated on six indicators: sleep quality, quantity, time awake, time to fall asleep, dream quality and dreams related to COVID-19.

Method

Data were extracted from a large longitudinal survey of a representative Canadian sample (N_{wave1} = 3617, see Table 2 for details). Respondents to the survey completed an in-depth questionnaire on eleven occasions over one year. For more methodological details, please see the survey's technical report (de la Sablonnière et al., 2020). The data for this report are from the 1st to the 11th waves of this longitudinal survey.

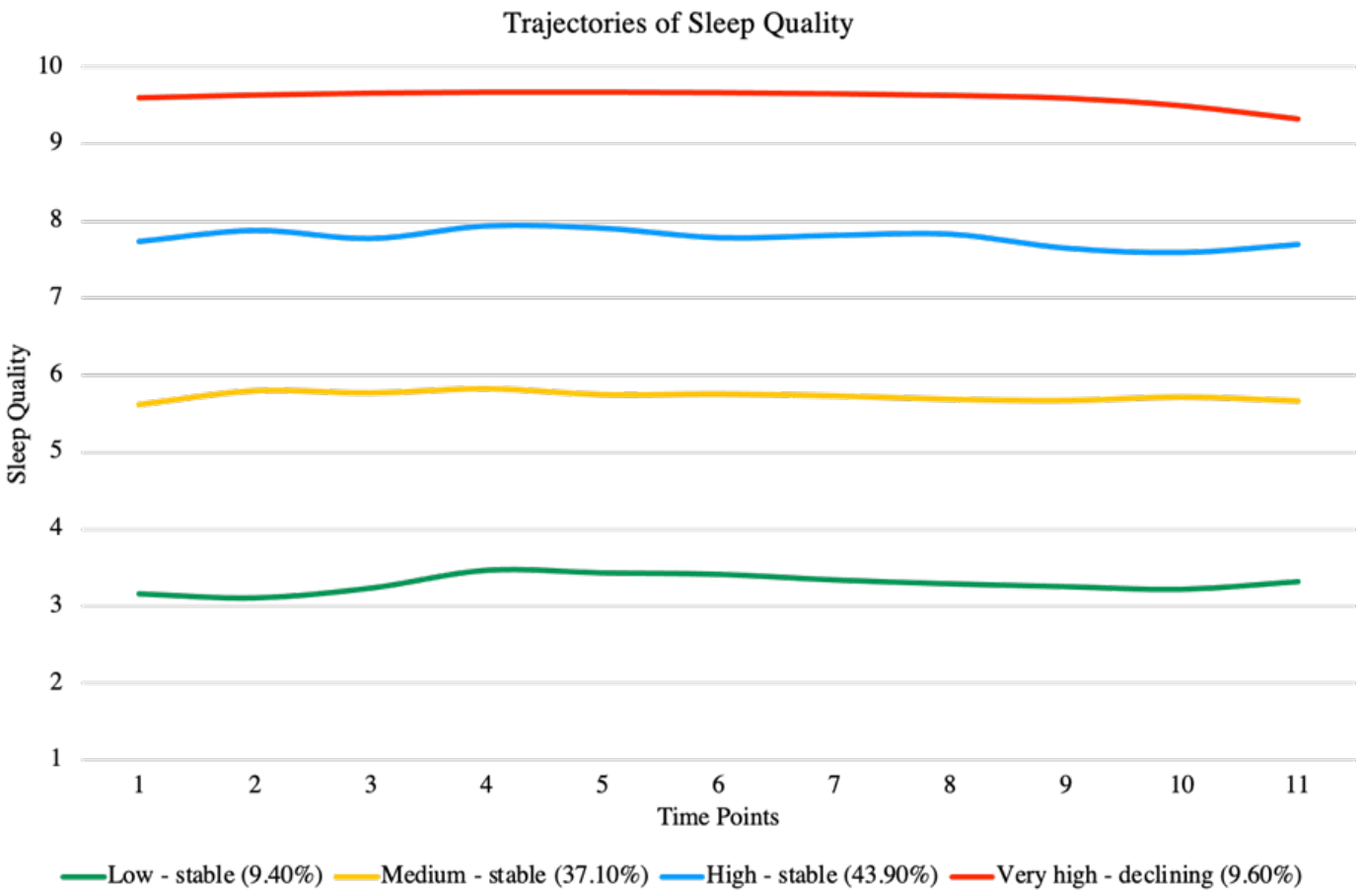
Table 2. Methodological and demographic information

Measurement time	Sample size	% (n) Women	Mean age (range)	Survey Dates
1	3617	50.50%	47.63	6 April - 6 May 2020
2	2282	48.90%	49.03	21 April - 11 May 2020
3	2369	49.20%	48.81	4 May - 25 May 2020
4	2296	48.50%	48.90	18 May - 10 June 2020
5	2154	48.70%	49.32	1 June - 23 June 2020
6	2116	48.80%	49.36	15 June - 13 July 2020
7	2072	49.10%	49.80	13 July - 8 August 2020
8	1871	49.40%	50.42	17 August - 13 September 2020
9	1821	48.40%	51.82	21 September - 19 October 2020
10	1883	48.40%	50.30	25 November - 28 December 2020
11	1869	50.0%	51.48	16 April – 5 May 2021

Results

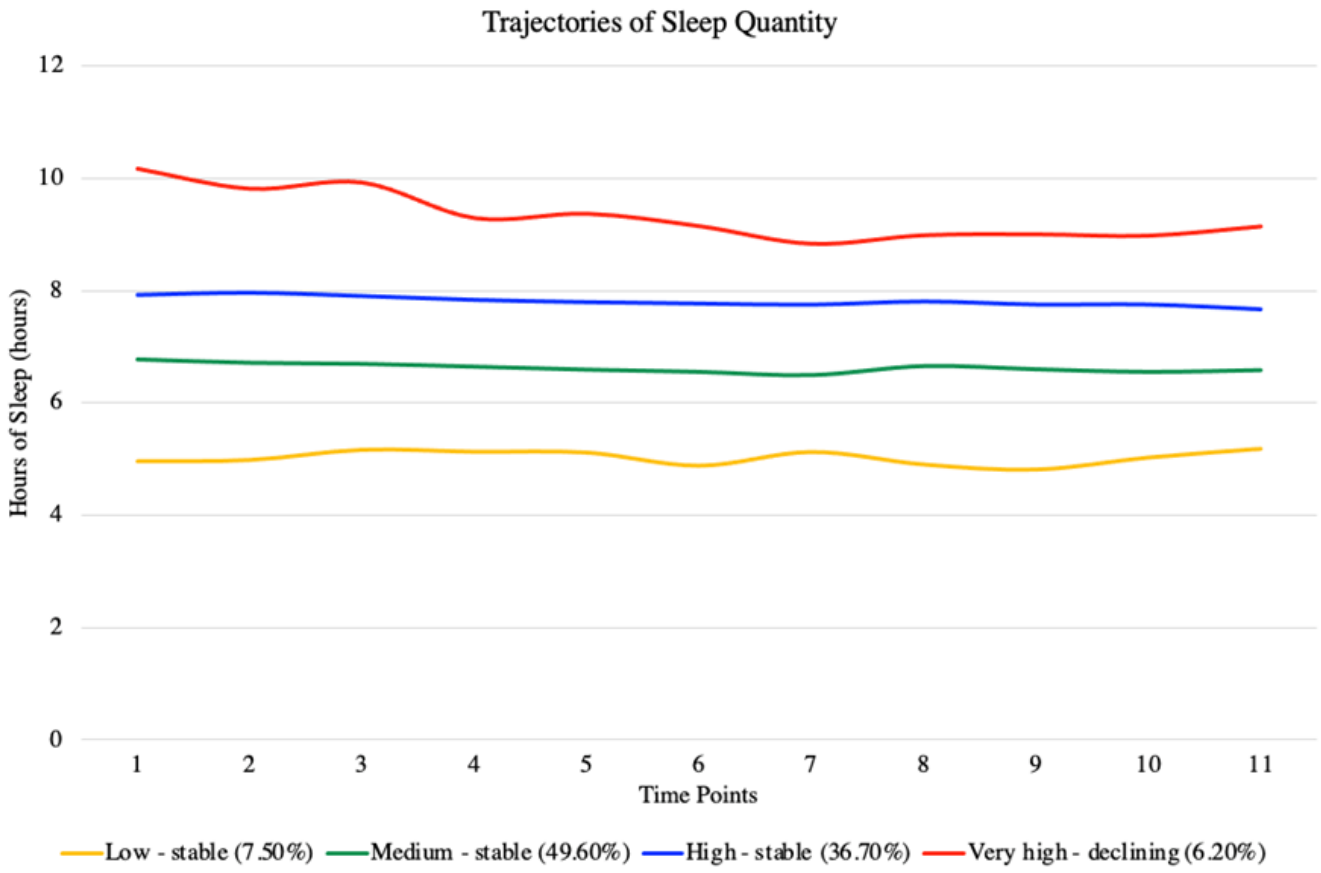
Hypothesis 1. We observed that the sample is divided into several groups of individuals with similar sleeping patterns across six sleep variables.

1. How would you describe the quality of your sleep during the last 24 hours? 1 = bad; 10 = good.



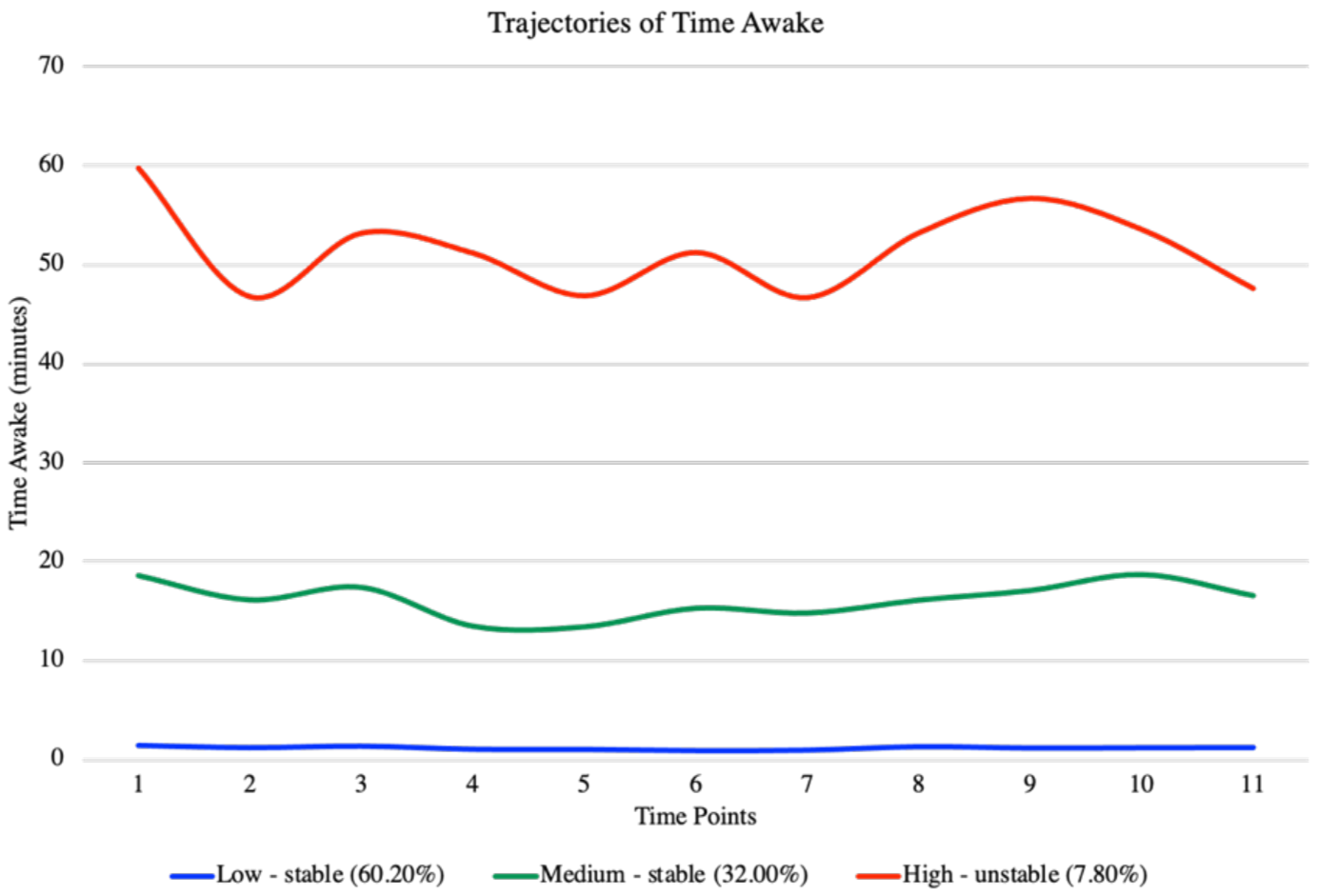
The results demonstrate that individuals are distributed in four different groups that describe the quality of sleep throughout the pandemic. These groups differ mostly in terms of the initial status of sleep quality, as the level of sleep quality for each group only shows a small change over time. More specifically, the Low-stable group (9.40% of the sample, M = 3.30) and the Medium-stable group (37.10% of the sample, M = 5.73) report the lowest sleep quality and have stable trajectories of sleep quality throughout the pandemic. The High-stable group (43.90% of the sample, M = 7.78) reports higher sleep quality with a stable tendency. Finally, the Very high-decreasing group (9.60% of the sample) shows the best sleep quality, but has a decreasing trajectory of sleep quality, reporting a mean of 9.63 through waves 1 to 7 which then decreases from waves 8 to 11 to reach an average of about 9.44.

2. How much sleep did you get in the last 24 hours? (In hours and minutes)



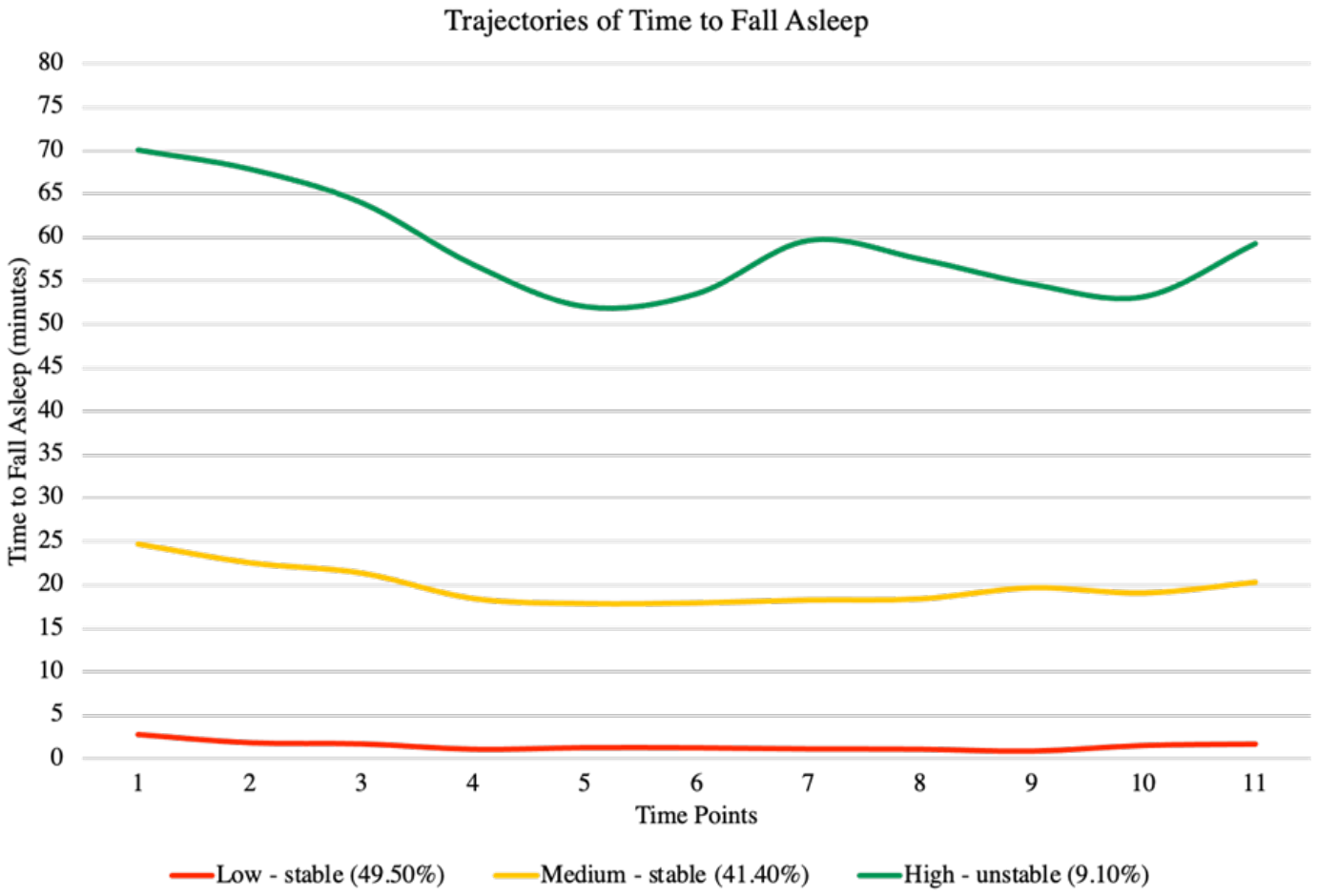
The results demonstrate that individuals are distributed in four different groups that describe the quantity of their sleep throughout the pandemic. The four groups clearly differ in terms of their initial status of sleep quantity in the last 24 hours and in terms of their fluctuation throughout the pandemic. The Low-stable group (7.50% of the sample, M = 5.02 hours) reports the lowest sleep quantity with an overall stable trajectory of sleep quantity despite some fluctuation. The Medium-stable group (49.60% of the sample, M = 6.62 hours) and the High-stable group (36.70% of the sample, M = 7.81 hours) report higher quantity of sleep with stable trajectories of sleep. Finally, the Very high-declining group (6.20% of the sample) reports sleeping 10.16 hours at wave 1, but that amount decreases through the pandemic to 8.83 hours of sleep at wave 7. A slight increase is observed through waves 8, 9, 10 and 11 to reach a final sleeping time of 9.13 hours at wave 11.

3. If you woke up during your sleep in the last 24 hours, about how long did you stay awake? (in minutes)



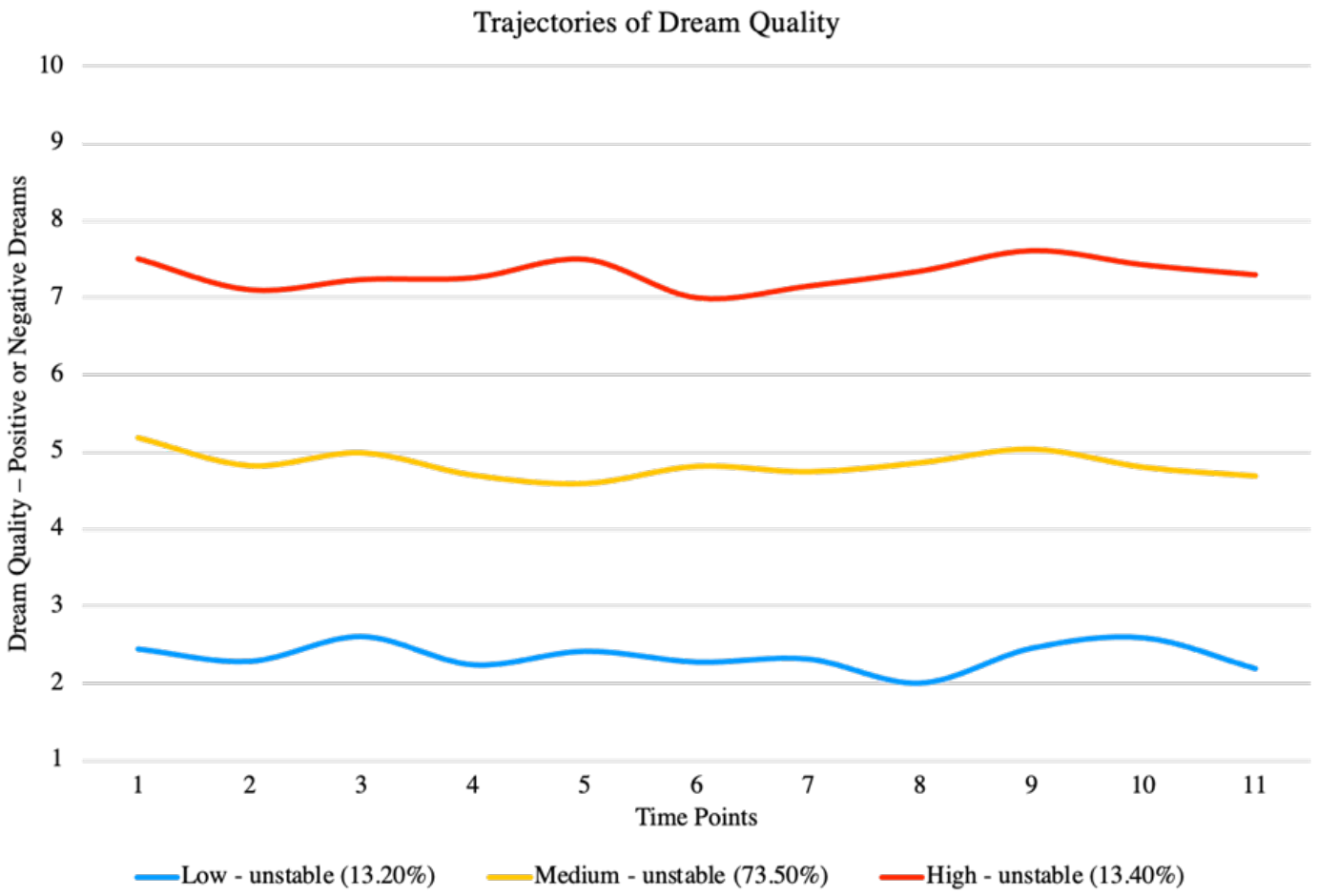
The results demonstrate that individuals are distributed in three groups that describe the time awake during sleep throughout the pandemic. In the case of time awake, groups differ in terms of initial status and in terms of change (pattern of fluctuation). The Low-stable group (60.20% of the sample, M = 1.22 minutes) and the Medium-stable group (32.00%, M = 16.18 minutes) report overall stable trajectories with few fluctuations and short awakenings during the night although the trajectory of the Medium-stable group shows more fluctuations. However, the High-unstable group (7.80% of the sample) is very different from the first two groups. The initial status of the High-unstable group is a lot higher (M = 51.54 minutes) in comparison to the other two groups. Furthermore, the amount of time awake decreases rapidly from wave 1 (59.79 minutes) to wave 2 (46.79 minutes). Throughout waves 3 to 11, three fluctuations are observed: (1) increase at wave 3 (53.21 minutes) followed by a decrease at wave 4 (51.19 minutes) and wave 5 (46.89 minutes). (2) Another increase at wave 6 (51.25 minutes) with a decrease at wave 7 (46.69 minutes). (3) Finally, an increase across waves 8 and 9 to 56.72 minutes with a decrease at waves 10 and 11 to 47.62 minutes.

4. How long did it take you to fall asleep when you went to bed? (in minutes)



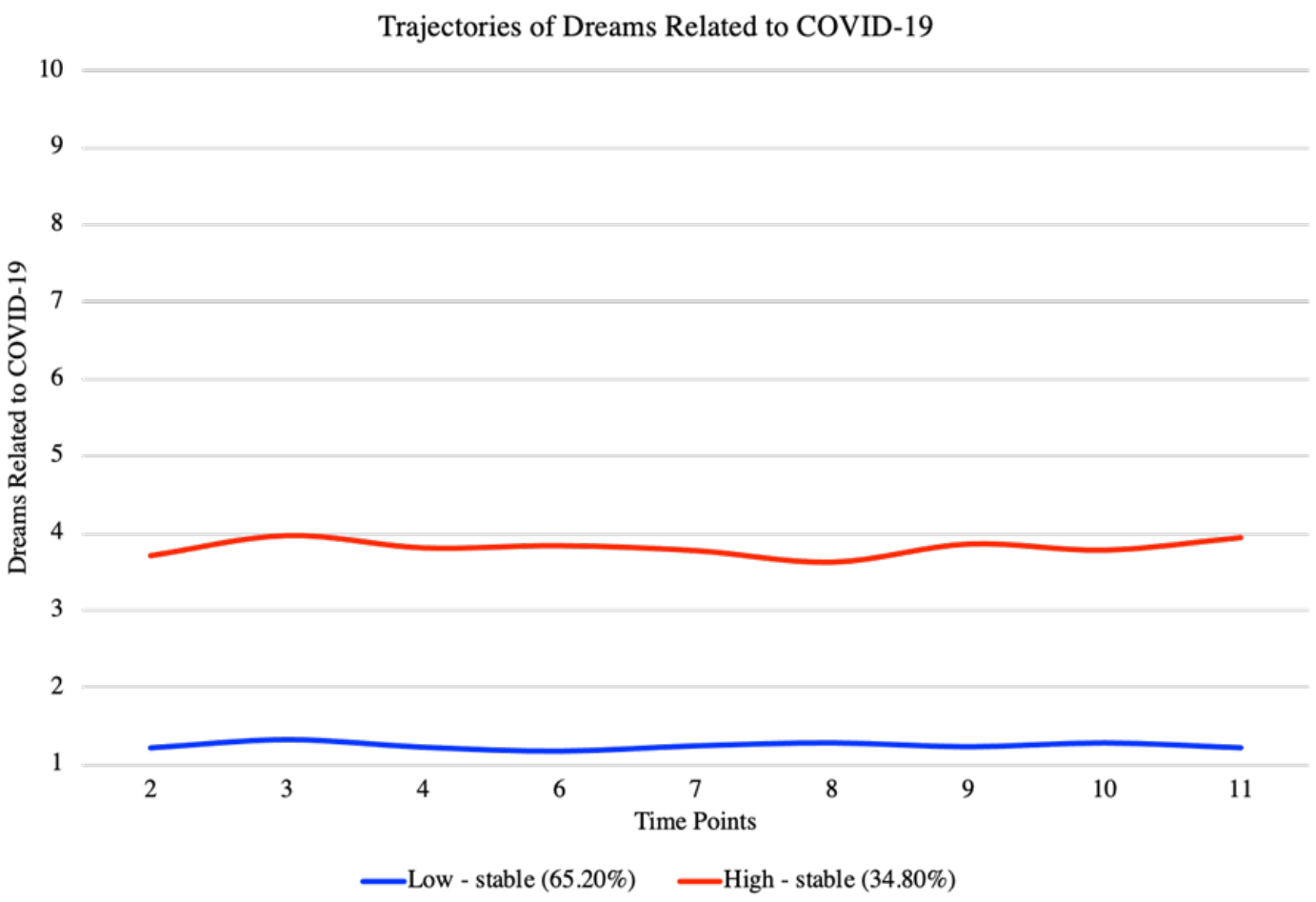
The results demonstrate that individuals are distributed in three different groups that describe the time to fall asleep throughout the pandemic. Concerning the time to fall asleep, groups differ both in terms of initial status and change. The Low-stable group (49.50% of the sample, M = 1.50 minutes) reports the shortest time to fall asleep through a stable trajectory. The Medium-stable group (41.40%) reports falling asleep in 24.75 minutes at wave 1, then that amount decreases to 18.23 minutes at wave 7 to increase throughout waves 8, 9, 10 and 11 to reach 20.30 minutes at wave 11. Finally, the High-unstable group (9.10%) reports falling asleep in 70.12 minutes at wave 1. That amount decreases to 52.02 minutes at wave 5 to then increase gradually through waves 6 and 7 to 59.67 minutes. Then, once again, time to fall asleep decreases from waves 8 to 10 to 53.15 minutes and finally increases to 59.30 minutes at wave 11. This group reports the longest time to fall asleep.

5. If you can remember a dream from the last 24 hours, overall, was this dream positive or negative? 1 = very positive; 10 = very negative (nightmare)



Results demonstrate that individuals are distributed in three groups that describe the valence of their dreams (positive or negative dreams) throughout the pandemic. Trajectories related to dream quality differ in terms of initial status. The Low-unstable group (13.20% of the sample, M = 2.35 out of 10) reports overall positive dreams through the trajectory. The Medium-unstable group (73.50%) reports neutral dreams with a mean of 5.19 out of 10 at wave 1. After wave 1, the valence of their dreams fluctuates between 4.60 and 5.04 from waves 2 to 9, with a decrease to 4.69 at wave 11. Finally, the High-unstable group (13.40%, M = 7.31 out of 10) reports having negative dreams through the trajectory.

6. If you can remember a dream from the last 24 hours, to what extent did it refer to the COVID-19 crisis? 1 = not at all - 10 = extremely



The results demonstrate that individuals are distributed in two different groups that describe the degree to which their dreams were related to COVID-19 throughout the pandemic (9 waves measured). The Low-stable group (65.20% of the sample, M = 1.24 out of 10) reports having the least dreams related to the COVID-19 crisis with a stable trajectory. Likewise, the High-stable group (34.80%, M = 3.81) consistently reports few dreams related to COVID-19 through the pandemic.

Conclusion

In general, Canadians reported having stable and adequate sleeping patterns throughout the COVID-19 pandemic. The majority of individuals reported having good sleep throughout the six variables measuring sleep: quality, quantity, time awake, time to fall asleep, dream quality and dreams related to COVID-19. For the people that are having a more troubled sleep, an unstable pattern emerged on two aspects of sleep, mainly time awake during the night and time to fall asleep.

Nevertheless, a minority of individuals reported certain sleep disturbances.
Quality of sleep. When questioned about sleep quality, a minority (9.40%) of individuals reported poor sleep quality with an overall score going as low as 3.30 out of 10.
Quantity of sleep. An important minority (44.20%) of individuals report consistently sleeping between 5.02 and 6.62 hours per night, which is less than the 7-9 hours recommended.
Time awake. When questioned about their time awakened, a minority (7.80%) of individuals reported staying awake a fluctuating average of 51.54 minutes per night, which surpasses the normal periods of restlessness of 10.00 - 30.00 minutes per night.
Time to fall asleep. A fluctuation in the time to fall asleep (normal average 10.00-20.00 minutes) is observed for a minority (9.10%) of individuals with times reaching as high as 70.12 minutes to fall asleep.
Dream quality. A minority (13.40%) of individuals reported having negative dreams throughout the COVID-19 pandemic with a mean of 7.31 out of 10.
Dreams related to COVID-19. A minority (34.80%) reported experiencing more dreams related to COVID-19 with a mean of 3.81 out of 10, which maintains the prevalence of COVID-19 dreams fairly low.

Implications

It is important for governments to consider the following fact:

Overall, throughout the COVID-19 pandemic, the majority of Canadians maintained customary sleeping patterns with few fluctuations. Only a minority had poor sleep with fluctuating disturbances. It is advisable for the government to implement tools that encourage the general maintenance of good sleeping hygiene, especially for individuals with poor sleep prior to the crisis.

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