Mood states of children and youth in Saskatchewan in the second year of COVID-19 pandemic: Insights from See Us, Hear Us 2.0 study

Nahin Shakurun[1], Daniel Adedayo Adeyinka [2], Tamara Hinz[3], Nazeem Muhajarine[1,4]

[1]Department of Community Health and Epidemiology, [2]Department of Research, Saskatchewan Health Authority, Sk, [3]Department of Psychiatry, College of Medicine, University of Saskatchewan, [4]Saskatchewan Population Health and Evaluation Research Unit, Saskatchewan

INTRODUCTION

During the 2021-2022 school year, the COVID-19 situation in Saskatchewan deeply affected the daily lives of children and families. Therefore, the mental health and psychological well-being of children became a significant source of concern amid the pandemic.

OOBJECTIVES

1. To examine the prevalence of various mood states among children and youth in Saskatchewan two years into the COVID-19 pandemic.
2. To identify factors associated with the current mood states of children and youth in Saskatchewan in the second year of the COVID-19 pandemic.

MATERIALS & METHODS

- **Study design:** Data from **"See Us, Hear Us 2.0"**, a cross-sectional study conducted between May and July 2022.
- **Study Population:** Participants aged 8 to 18 years and their parents/caregivers (N=563 dyads).
- **Outcome: Current mood states,** measured by the Coronavirus Health Impact Survey (CRISIS 3.0), a scale ranging from 0 to 4, with a high score indicating more negative moods.(1,2)
- **Independent variables (categories):** Schooling experiences, behavioural factors, COVID-19 transmission, household factors, coping ability, and socioeconomic factors.
- **Statistical analysis**
- Descriptive statistics were presented as weighted percentages, point estimates and 95% confidence intervals (CI).
- Principal component analysis (PCA) was used to derive a single component with maximum variability for the CRISIS mood scale.
- Multiple linear regression modelling was conducted and presented as significant at p<0.05.
- Interactions between age, gender, and ethnicity by household income, location of residence and parental immigration status were assessed.
- **Missing data:** Missing data pattern was evaluated. Multiple imputation by chained equation technique (MICE) was applied to the dataset.(3)
- **Representativeness:** Sampling weights were applied for age, gender, and location of residence using 2016 Canadian Census data.

RESULTS

Current mood states of Children and youth:
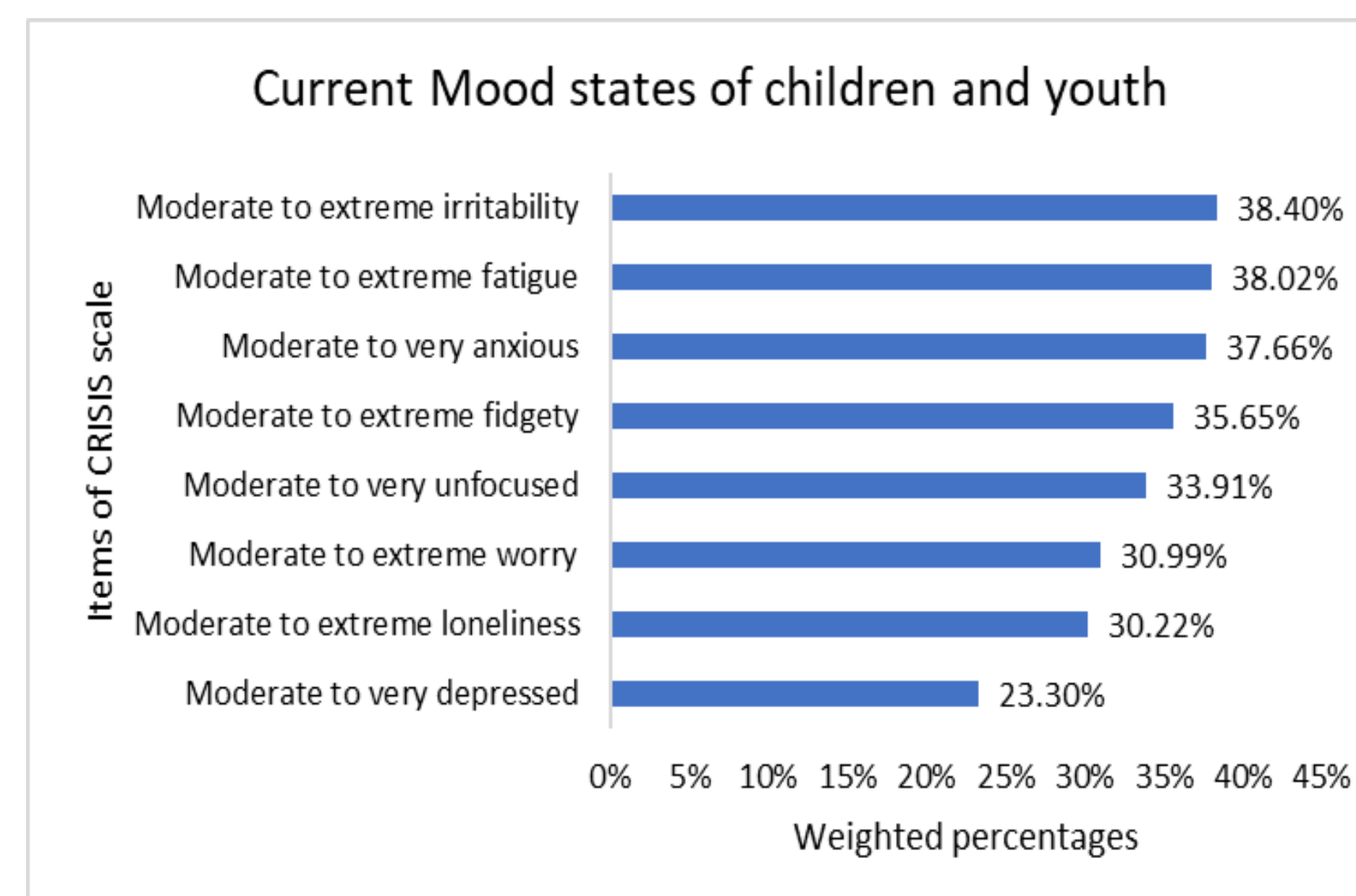The average mood score was 1.43 (Standard deviation=0.77), indicating relatively mild overall negative moods.

Figure 1: CRISIS mood symptoms of children and youth in Saskatchewan, 2021-2022

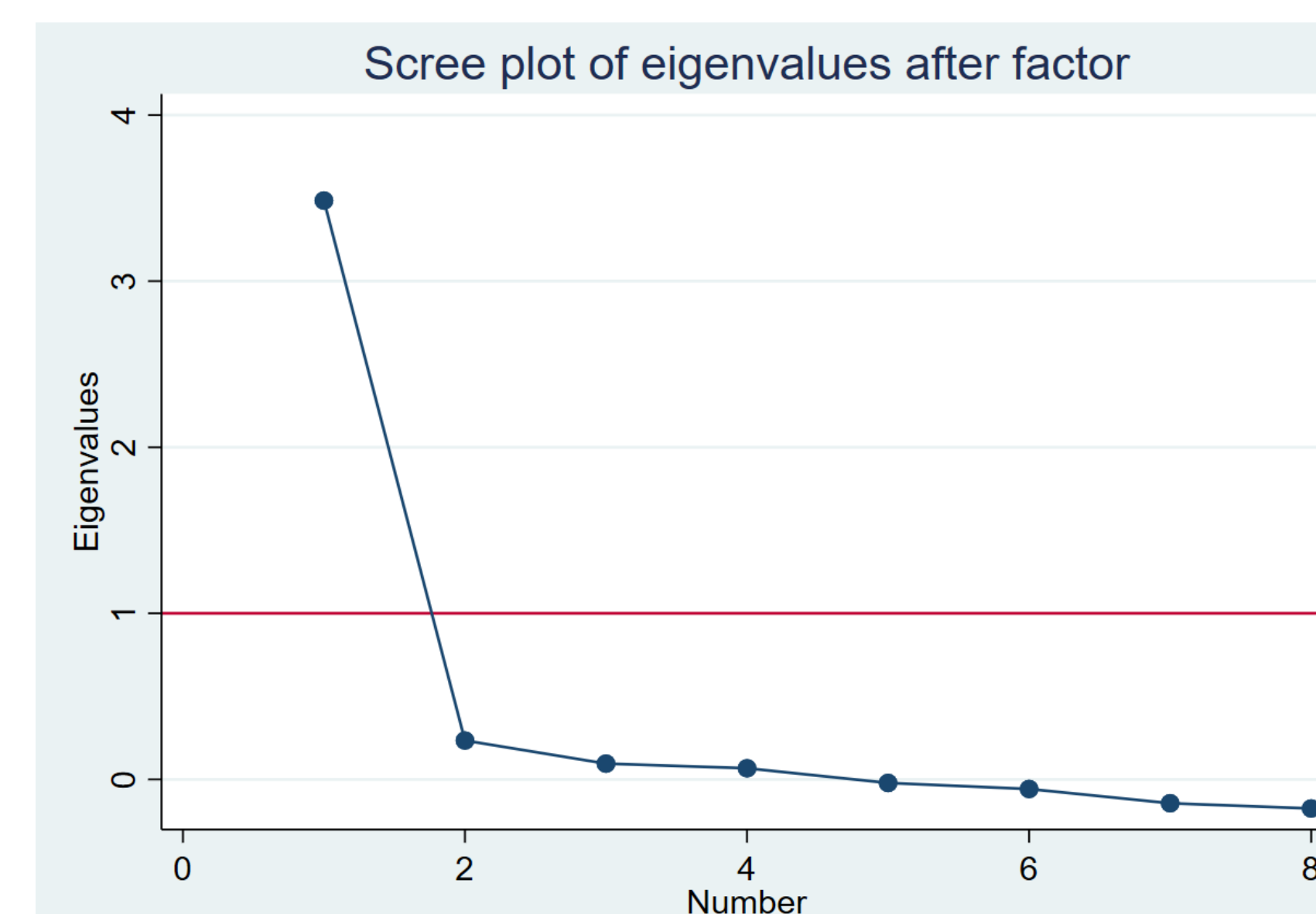### Principal Component Analysis

Figure 2: Scree plot of eigen values after principal component analysis of CRISIS scale

- The first component was retained as the principal component.
- A derived score from principal component was generated and used in further analysis.
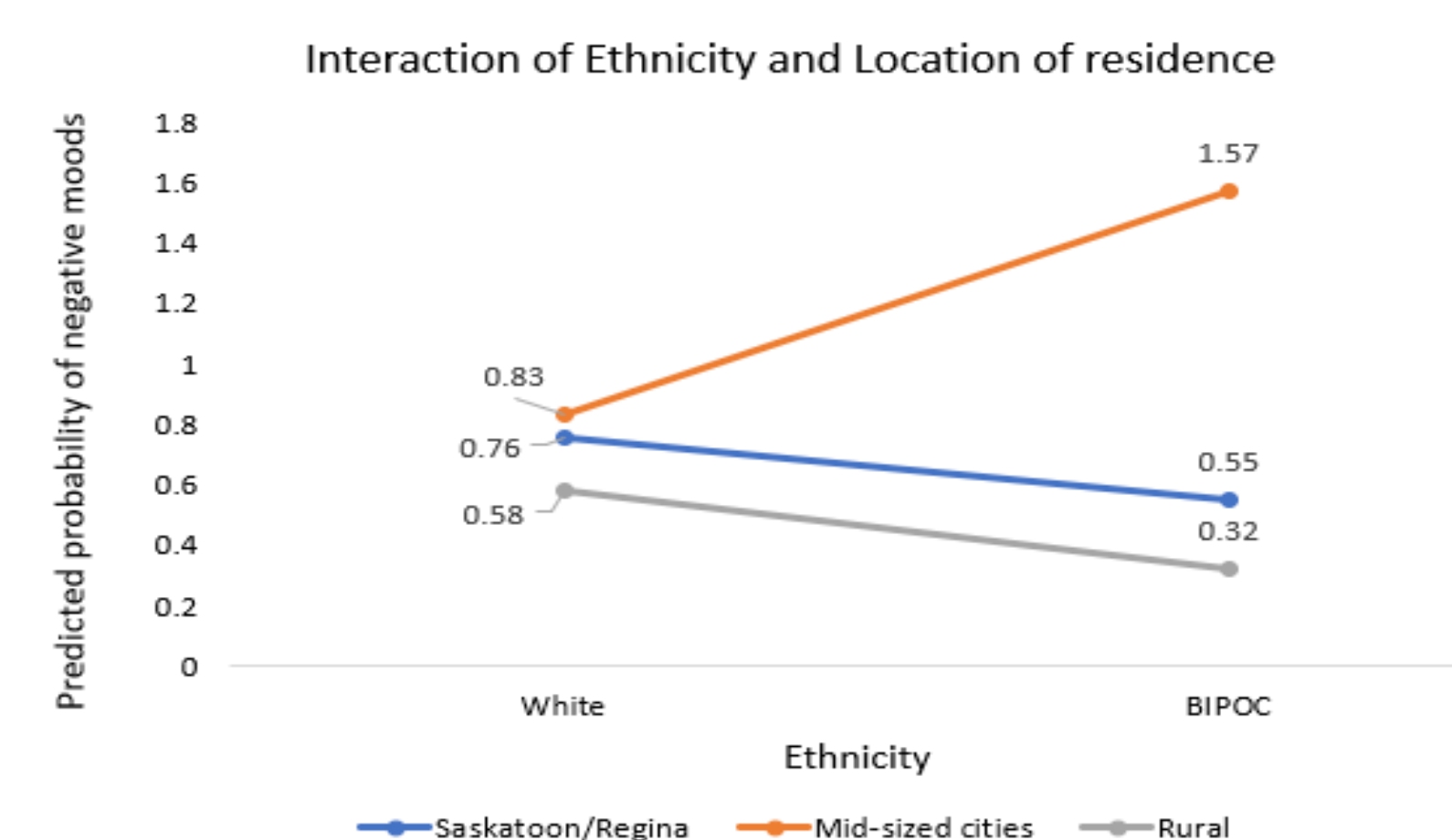

Figure 3: Significant interaction of ethnicity and location of residence.

Table 2: Multiple linear regression model, factors associated with the mood score of children and youth in Saskatchewan, 2021-2022

| Variables	Coefficient (95% CI)
Age group	
8-11 years	Ref
12-15 years	0.11(-0.05, 0.26)
16-18 years	0.27(0.02, 0.52)*
Gender	
Boy	Ref
Girl	0.10(-0.03, 0.23)
Non-binary	0.78(0.35, 1.21)*
Location of residence	
Saskatoon/Regina	Ref
Mid-sized city/Town	0.07(-0.18, 0.32)
Rural	-0.17(-0.34, -0.00)*
Learning method	
Attended in-person all the year	Ref
Mix of online and in-class learning	0.24(0.04, 0.43)*
Online/Home schooling/other	0.09(-0.23, 0.41)
Impact of pandemic on extracurricular activities	
No impact	Ref
A little to a lot impact	0.18(0.04, 0.33)*
Change in physical activity	
Increased activity	Ref
The same	0.21(0.05, 0.37)*
Decreased activity	0.15(-0.08, 0.38)
Change in screen time	
Decreased	Ref
The same	0.07(-0.09, 0.23)
Increased	0.34(0.16, 0.53)*
COVID-19 positive cases at home	
No cases	Ref
Positive case was present	0.20(0.04, 0.36)*
Family Conflict	
A lot/ somewhat less	Ref
No real change	-0.07(-0.38, 0.24)
Varied	0.06(-0.26, 0.38)
A lot/ somewhat more	0.32(0.00, 0.64)*
Coping ability	
Most times/ always	Ref
Sometimes	0.48(0.34, 0.63)*
Hardly ever	0.70(0.40, 0.99)*
Ethnicity x Location of residence	
BIPOC x mid-sized town/cities	0.95(0.16, 1.75)*
BIPOC x rural	-0.06(-0.44, 0.33)
Ethnicity x Parental immigration status	
BIPOC x None/ either born in Canada	-0.51(-0.97, -0.05)*

*Significant at p<0.05
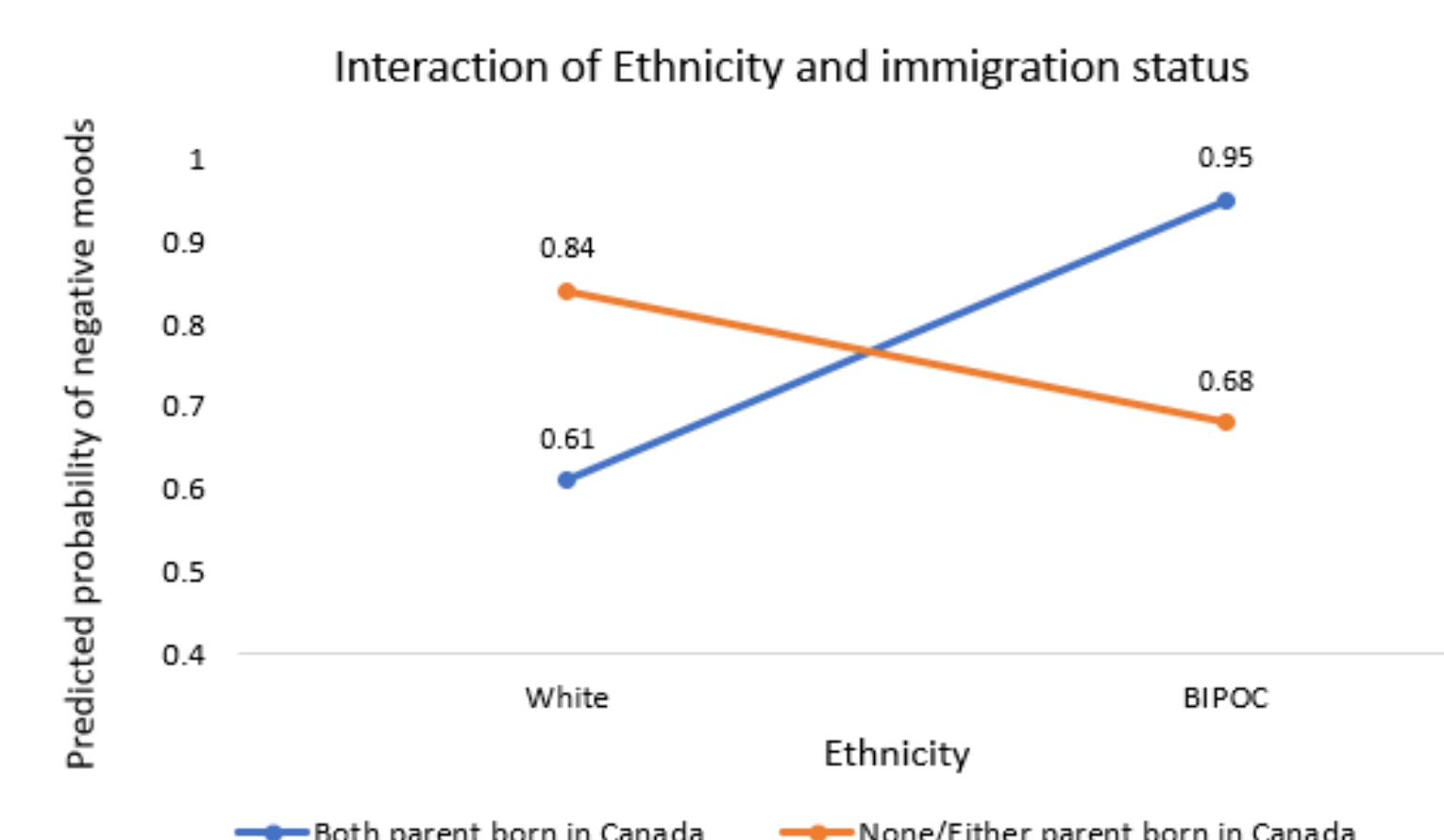
Figure 4: Significant interaction of ethnicity and parental immigration status.

KEY TAKEAWAYS

- Negative moods were more pronounced among older children (16-18 years) and those who identified themselves as non-binary.
- Children who had disrupted extracurricular activities experienced significantly higher negative moods.
- Among the behavioural factors, children who had increased screen time, reported higher negative moods
- Conflicts in the family significantly increased negative mood score among children and youth.
- Children who expressed less ability to cope with pandemic–related disruptions experienced higher negative moods.
- BIPOC children , compared to White, in small towns in SK experienced higher negative moods than their counterparts in cities or rural communities. (Figure 3)
- BIPOC children, compared to White, whose parents were born in Canada, experienced higher negative moods than their counterparts who had one/both parents born outside of Canada. (Figure 4)

Public Health Implication

Our study found that children and youth in Saskatchewan are facing mental health challenges. Tailored interventions for specific age groups, gender identities, ethnic backgrounds, and geographic locations are needed to alleviate the pandemic-related longer-term effects on the mental health of children and youth in Saskatchewan.

REFERENCE

1. Merikangas K, Milham M, Stringaris A. The Coronavirus Health and Impact Survey (CRISIS) New York: Child Mind Institute and Nathan Kline Institute; 2020 [cited 8 April 2021]. Available from: http://www.crisissurvey.org/.
2. Nikolaidis A, Paksarian D, Alexander L, Derosa J, Dunn J, Nielson DM, et al. The Coronavirus Health and Impact Survey (CRISIS) reveals reproducible correlates of pandemic-related mood states across the Atlantic. medRxiv. 2020;Preprint. https://doi.org/10.1101/2020.08.24.20181123 PMID: 32869041
3. Bouhlila DS, Sellaouti F. Multiple imputation using chained equations for missing data in TIMSS: a case study. Large-Scale Assess Educ. 2013 Sep 16;1(1):4.