Seasonality in Mental Health-Related Hospitalizations by Children, Youth and Adults in New Brunswick

Scott Ronis, PhD1, Amanda Slaunwhite, PhD2, David Miller1, Paul Peters, PhD2
1Department of Psychology, UNB-Fredericton, 2Department of Sociology, UNB-Fredericton

Overview

What is known:

• Utilization of acute care and inpatient hospital services by children and adolescents has become a growing issue in the past decade because of demonstrated increases in hospital admissions and emergency room visits.
• Mental health-related hospital admissions among Canadian children and adolescents aged 5-24 rose by 45% from 2006/2007 through 2013/2014, and studies in the US have found comparable increases.1 2
• A much higher proportion of adults admitted to hospital for mental health problems travelled via ambulance compared to children and adolescents.

Contribution:

• Little is known about the non-diagnostic or non-disease-related factors that influence the likelihood of young people being admitted to hospital for mental health problems in developed countries.
• Seasonal variations in mental health-related hospital admissions have been described in past research as having “important implications for resource planning and prevention.”4

This study works to address this gap in the literature by measuring seasonal variations in mental health-related hospitalizations by children and adolescents using administrative hospital data from New Brunswick, Canada.

Methods

Data Source

• Data for this project was sourced from New Brunswick’s Discharge Abnormal Database (DAD).
• The DAD is compiled using information provided to the New Brunswick Ministry of Health by all hospital institutions throughout Canada (21 acute care and 15 day-surgery institutions).

Data Analysis

• The cosinor method was used to measure the peak (month with the highest number of admissions), amplitude (the amount of fluctuation from the peak and average psychiatric admissions per month) and phase (number of months in a cycle) of psychiatric admissions over the 12-month period from January-December.

To determine the significance of monthly differences in psychiatric admissions, a general linear model (GLM) with a Poisson distribution was used to calculate rate ratios (RRs).

Results

Seasonal Trends: Adults

• Psychiatric hospital admissions adults (20 years and older) exhibited significantly lower admissions from April (RR=0.78, p=0.001) and May (RR=0.75, p=0.001), and significantly fewer in the month of December (RR=0.86, p=0.043).

Seasonal Trends: Adolescents and Youth

• Child and adolescent psychiatric admissions per 100,000 population exhibited significantly lower seasonality (p<0.025).
• Multivariate logistic regressions showed that the likelihood of psychiatric hospitalization was highest in December and lowest in April.

Policy and Practice Implications

• The increased hospital admissions in the fall-winter months among children and adolescents could be attributed to symptomology related to climate factors (e.g., the impact of sunlight on levels of serotonin) or the development of seasonal affective disorder.
• It is also possible that the increase in hospital admissions by children and adolescents during the school year is due to increased psychological distress related to academic stressors, the regimented structure of a school day, or negative social interactions.

• Greater use of high-stakes testing, and parental, peer, or community pressures to achieve academic success and attend post-secondary schools, have been shown to be sources of psychological distress.

• In this study we found that psychiatric admissions to hospital by adults aged 20 and over peaked in early May, which is consistent with many previous studies.9 10

• This could be due to climate, such as the length of daylight, that help regulate mood or the delayed onset of spring health problems in the winter months that become unmanageable as a result of environmental and social changes in the spring.11

Limitations

• There are a number of limitations to consider when interpreting the results of this study. Patients were grouped into age categories (children: 5-10 years; adolescents: 11-15 years and 16-19; adults: 20-years and older) to limit residual disclosure and maximize patient confidentiality.
• This study used hospital admission data and does not include acute care visits to emergency room settings where patients were not admitted to a hospital.

Conclusion

• We found that psychiatric admissions to hospital peaked in the winter months for children and adolescents, whereas admissions by adults over 20 years of age were the highest in the spring (April and May).

These findings lend support to existing efforts to identify environmental factors that impact the likelihood of psychiatric hospitalizations by children, adolescents and adults.

Contact:
Scott T. Ronis, PhD, LCP (VA), L Psych, (NB) Associate Professor & Director of Graduate Studies Department of Psychology University of New Brunswick Email: ronis@unb.ca www.scottronis.com

Seasonality in Mental Health-Related Hospitalizations by Children, Youth and Adults in New Brunswick

Scott Ronis, PhD1, Amanda Slaunwhite, PhD2, David Miller1, Paul Peters, PhD2
1Department of Psychology, UNB-Fredericton, 2Department of Sociology, UNB-Fredericton

Overview

What is known:

• Utilization of acute care and inpatient hospital services by children and adolescents has become a growing issue in the past decade because of demonstrated increases in hospital admissions and emergency room visits.
• Mental health-related hospital admissions among Canadian children and adolescents aged 5-24 rose by 45% from 2006/2007 through 2013/2014, and studies in the US have found comparable increases.1 2
• A much higher proportion of adults admitted to hospital for mental health problems travelled via ambulance compared to children and adolescents.

Contribution:

• Little is known about the non-diagnostic or non-disease-related factors that influence the likelihood of young people being admitted to hospital for mental health problems in developed countries.
• Seasonal variations in mental health-related hospital admissions have been described in past research as having “important implications for resource planning and prevention.”4

This study works to address this gap in the literature by measuring seasonal variations in mental health-related hospitalizations by children and adolescents using administrative hospital data from New Brunswick, Canada.

Methods

Data Source

• Data for this project was sourced from New Brunswick’s Discharge Abnormal Database (DAD).
• The DAD is compiled using information provided to the New Brunswick Ministry of Health by all hospital institutions throughout Canada (21 acute care and 15 day-surgery institutions).

Data Analysis

• The cosinor method was used to measure the peak (month with the highest number of admissions), amplitude (the amount of fluctuation from the peak and average psychiatric admissions per month) and phase (number of months in a cycle) of psychiatric admissions over the 12-month period from January-December.

To determine the significance of monthly differences in psychiatric admissions, a general linear model (GLM) with a Poisson distribution was used to calculate rate ratios (RRs).

Results

Seasonal Trends: Adults

• Psychiatric hospital admissions adults (20 years and older) exhibited significantly lower admissions from April (RR=0.78, p=0.001) and May (RR=0.75, p=0.001), and significantly fewer in the month of December (RR=0.86, p=0.043).

Seasonal Trends: Adolescents and Youth

• Child and adolescent psychiatric admissions per 100,000 population exhibited significantly lower seasonality (p<0.025).
• Multivariate logistic regressions showed that the likelihood of psychiatric hospitalization was highest in December and lowest in April.

Policy and Practice Implications

• The increased hospital admissions in the fall-winter months among children and adolescents could be attributed to symptomology related to climate factors (e.g., the impact of sunlight on levels of serotonin) or the development of seasonal affective disorder.
• It is also possible that the increase in hospital admissions by children and adolescents during the school year is due to increased psychological distress related to academic stressors, the regimented structure of a school day, or negative social interactions.

• Greater use of high-stakes testing, and parental, peer, or community pressures to achieve academic success and attend post-secondary schools, have been shown to be sources of psychological distress.

• In this study we found that psychiatric admissions to hospital by adults aged 20 and over peaked in early May, which is consistent with many previous studies.9 10

• This could be due to climate, such as the length of daylight, that help regulate mood or the delayed onset of spring health problems in the winter months that become unmanageable as a result of environmental and social changes in the spring.11

Limitations

• There are a number of limitations to consider when interpreting the results of this study. Patients were grouped into age categories (children: 5-10 years; adolescents: 11-15 years and 16-19; adults: 20-years and older) to limit residual disclosure and maximize patient confidentiality.
• This study used hospital admission data and does not include acute care visits to emergency room settings where patients were not admitted to a hospital.

Conclusion

• We found that psychiatric admissions to hospital peaked in the winter months for children and adolescents, whereas admissions by adults over 20 years of age were the highest in the spring (April and May).

These findings lend support to existing efforts to identify environmental factors that impact the likelihood of psychiatric hospitalizations by children, adolescents and adults.

Contact:
Scott T. Ronis, PhD, LCP (VA), L Psych, (NB) Associate Professor & Director of Graduate Studies Department of Psychology University of New Brunswick Email: ronis@unb.ca www.scottronis.com
2. Canadian Institute for Health Information. *Care for Children and Youth With Mental Disorders*. Ottawa; 2015.