

Winter 2021 Practicum Abstracts – MPH Epidemiology Students

N. A.

Nova Scotia Health – Diagnostic Imaging

Epidemiologic methods have generally not been used to describe MRI utilization in Nova Scotia, but could provide valuable information on demographic patterns that would not be apparent when solely looking at volumes of procedures. This project seeks to build on an earlier report from 2019 on MRI utilization in Nova Scotia by describing demographic trends from 2015-2019, as well as comparing 2020 utilization to 2019 in order to observe changes following COVID-19 restrictions, using frequencies and rates per capita. Data were extracted from the Picture Archival Communication System (PACS) database on all MRI procedures done by Nova Scotia Health from the years 2015-2020 including year, month, and site of procedure, as well as patient age, sex, and county of residence. Important findings of this project include: higher female rates than male rates; increase in rates over time; more dramatic increases over time in the middle-aged categories compared to higher and lower age groups; highest male rates in the 70-79 age category but highest female rates in the 40-59 age category; large inconsistencies in procedure rates by county even when accounting for age and sex; and the return to normal MRI volumes in September 2020 following a dip in volumes starting in February, low point in April, and increase starting in May. This information can be used to inform health services planning regarding accessibility, appropriateness, and health care provider education. Future directions include investigating effects of wait times on access to services, effects of occupation on utilization by county, and effects of county and local general practitioner clinical practice on referral patterns.

A. C.

The Princess Margaret Cancer Centre (UHN) - Division of Medical Oncology and Hematology

I completed my practicum at the Princess Margaret Cancer Centre on comorbidity and lung cancer outcome. The project used data from 13 study sites of the Clinical Outcomes Studies of the International Cancer Consortium (COS-ILCCO). All 13 study sites collected comorbidity data from their participants (surveyed or from medical records), but they varied in the type of comorbidities collected, disease definition, and coding. The comorbidity variables were harmonized across study sites. Summary reports of the comorbidity prevalence distribution were produced for each study to aid in the inclusion and exclusion of variables. The same report was produced for the covariates to identify patterns of missingness across studies. Two different sets of models were fitted as diagnosis procedures before fitting the final model: a univariate Cox Proportional Hazards (PH) model for the comorbidity variables, and a basic Cox PH model adjusted for age, sex, ethnicity, stage of cancer at diagnosis, type of smoker, and education. The two models were fitted to each study site and the pooled data. To consider the effect of study sites, different approaches were taken in fitting the models – by adjustment or stratification and the meta-analytical method. The next steps include the decision on which approach to take depending on how similar the results are between the models fitted for the pooled data. This project, although still in progress, has also been an essential learning opportunity for me. Its impact on

detailing comorbidity, specifically with regards to cardiometabolic and respiratory health, on lung cancer will also be important to help improve care, disease management, and disease outcome.

E. C.

St. Michael's Hospital – Head Injury Clinic

Background. –There is limited evidence on the effectiveness of educational intervention, delivered through written information only, in mild traumatic brain injury patients with persistent symptoms during their chronic phase of recovery.

Objective.– To reduce post-concussion symptoms, maintain quality of life and community engagement, and minimize healthcare utilization in the targeted population.

Methods.– Patient reported data was collected at study baseline (≥ 3 months post-concussion) and repeated at 12 weeks follow-up in patients attending a tertiary care clinic, randomized to an intervention group ($n=22$) and control group ($n=24$). The intervention consists of 3 e-learning modules administered at study baseline, 6, and 12 weeks. Data collected from both groups included The Rivermead Post Concussion Symptoms Questionnaire (RPQ), the Participation Assessment with Recombined Tools-Objective (PART-O) questionnaire, Quality of Life after Brain Injury – Overall Scale (QOLIBRI-OS) questionnaire and healthcare utilization. Paired t-tests were used for normally distributed data while the Wilcoxon Signed Rank tests were used for nonparametric data.

Results.– Changes in RPQ scores were not statistically significant in either study arm nor when stratified by sex or symptom category. Statistically significant decreases in health service utilization were observed for family doctor and rehab visits in the intervention group and alternative therapy in both groups. Participants in the intervention group returned to their baseline community activities, (productivity, social relations, and averaged and balanced total scores) whereas the control group did not (all $p < 0.037$). Over the study period, we observed a trend toward improved quality of life in the intervention group compared to the controls (all $p > 0.05$).

Conclusion.– Despite the small sample size, our findings support improvements in community engagement and quality of life associated with the e-learning modules among patients experiencing persistent post-concussion headache.

A. L.

Ontario Health (Cancer Care Ontario) - Occupational Cancer Research Centre

I completed my second practicum placement at the Occupational Cancer Research Centre (OCRC). This research centre is a part of Ontario Health and aims to develop systems to monitor trends in occupational disease across the province. I worked specifically in the Occupational Disease Surveillance System (ODSS) team. The ODSS uses data from 2.2 million Ontario workers. They followed these workers over time and collected disease diagnosis information from various databases. During my practicum I worked on 2 main deliverables which included: 1) a project looking at how to apply external exposure data from a job exposure matrix to the occupational disease surveillance system cohort, and 2) using

results from the occupational disease surveillance system to draft knowledge translation products in the form of alerts and bulletins. Through these projects I gained a lot of knowledge of occupational risks and cancers of different groups to best create the knowledge translation products. These knowledge products were reviewed by my supervisor and important stakeholders with the end goal of having them published on the odsp-ocrc.ca website. I was also able to develop skills in data manipulation using SAS to merge two large datasets to create the desired final products. I was able to take the lead in designing a data visualization tool and present my ideas to external collaborators. Overall, I enjoyed my time working at OCRC. The entire research team has been supportive and helpful throughout my time and have demonstrated a collaborative and positive work environment.

I. M.

Centre for Addiction and Mental Health – Ontario Tobacco Research Institute

The COVID-19 pandemic has had enormous mental health impacts on populations worldwide, with some groups being more vulnerable to poor mental health outcomes than others. In particular, young people who belong to gender and sexual minority groups have reported increased mental health-related harms due to social isolation, unsafe home environments, and a lack of mental health and addiction services that are suitable for their needs. Despite the swift emergence of tele-health services for mental health and addictions, research from across North America has determined that issues of access are pervasive for this population. Using a survey disseminated to youth identifying as LGBTQ2S+ in Ontario and Quebec, we aimed to better understand common characteristics among youth who have experienced barriers to accessing mental health and addictions supports since March 2020. In addition to uncovering high rates of suicidality and reports of experiencing barriers to access since the beginning of the pandemic, our analysis of data from 886 participants found that several demographic, mental health, and substance-related factors were significantly associated with the experience of barriers to accessing mental health and addictions supports. Notably, a lifetime diagnosis of any mental illness (as well as several individual mental health diagnoses), suicidal ideation in the past year, past year use of any illicit substance (along with alcohol use, tobacco use, and e-cigarette use), and socioeconomic status were associated with LGBTQ2S+ youth experiencing barriers to accessing mental health and addictions services. This exploratory analysis provides a valuable foundation for future studies to further investigate identified characteristics in order to adapt mental health and addictions services during and beyond the COVID-19 pandemic. This research should seek to address the unique needs and challenges faced by youth belonging to gender and sexual minority groups.

S. N.

Princess Margaret Cancer Centre – Supportive Care Research

Title: The Experience of Family Caregivers of Acute Leukemia Patients after Diagnosis: A Grounded Theory Study

Objective: The diagnosis of life-threatening or advanced cancer is often highly traumatic for family caregivers (FCs). Acute leukemia (AL) is a life-threatening blood cancer with sudden onset which leads to

urgent hospitalization for intensive treatment. The disease and the treatment are likely to cause distress in both the patients and their FCs; in fact, there are studies to suggest that advanced cancer caregivers have more psychological needs than the patients themselves. Traumatic stress disorders occur in a substantial proportion of FCs of patients with AL. However, there is a paucity of research to elucidate their experience. This lack of knowledge has limited our ability to help them manage their distress. Thus, the purpose of this study is to characterize the experience of FCs in the first month after the diagnosis of AL in their family member.

Methods: FCs of patients with AL who are English-speaking and ≥ 18 years old were recruited from the Princess Margaret Cancer Centre to participate in a semi-structured qualitative interview about their experience with AL in the first month after their family member was admitted to hospital after diagnosis. Interviews were audio-recorded, transcribed verbatim, and imported into NVivo 10. Two coders, CM and SN, used a grounded theory approach to conduct data analysis.

Results: To date, nine FCs have been interviewed. FCs' ages ranged from 44 to 69 and most FCs were spouses to the patient ($n = 6$; 66.7%), women ($n = 5$; 55.5%), Caucasian ($n = 7$; 77.8%), born in Canada ($n = 8$; 88.9%), and all had at least a high school education. All FC interviews were completed between week two and week four after their family member was admitted to hospital after diagnosis. Theoretical sampling will be used to recruit a few more FCs in week one and after discharge. Thus, data analysis and theory construction are ongoing.

Conclusion: The findings of this study will be relevant for the development of targeted psychotherapeutic interventions for this population.

C. R.

Public Health Agency of Canada – Maternal, Child and Youth Health Division

I completed my practicum at the Public Health Agency of Canada in the Maternal, Youth and Child (MYC) Division. This division takes care of maternal risk factors, prenatal epidemiology and congenital anomalies surveillance for Canada. This is in addition to pediatric cancer surveillance, rare diseases in children surveillance and neurodevelopmental disorders. My roles with the MYC team these past four months was to develop a pediatric cancer indicator framework, help with perinatal indicator standardization, and begin to lead a survival analysis on subsequent malignant neoplasms (SMN) and a regression analysis on risk factors on stopping exclusive breastfeeding before 6 months. I did a literature review for the indicator framework, which has resulted in a master list of 300 indicators, which we are minimizing before sharing with our stakeholders. I revised SAS code and added new code to it to calculate values for the perinatal indicator standardization. We also considered guidelines for the next release such as revising case definitions, collapsing groups within stratifications and creating standardized documentation. We have currently done this for all the indicators we get from CCHS and will soon be continuing with the indicators for DAD. For the SMN project, I am doing a subdistribution hazards model to determine the time to the development of an SMN with the competing risk of death using cancer surveillance data. This analysis will help to determine if certain demographics or treatment modalities increase the risk of SMN. For the breastfeeding analysis, we will use 2017 CCHS and log binomial regression to determine demographic risk factors and reasons for not breastfeeding for 6

months exclusively. This will help inform guidelines to improve exclusive breastfeeding in these groups. Overall, I have built many epidemiological competencies in these projects and I am excited for continued growth as an epidemiologist with this team.

T. W.

St. Michael's Hospital – Head Injury Clinic

Background

There is limited evidence on the effectiveness of educational interventions in mild traumatic brain injury patients with persistent symptoms during their chronic phase of recovery.

Objective

To reduce post-concussion symptoms, maintain quality of life and community engagement, and minimize healthcare utilization in the targeted population.

Methods

Patient reported data was collected at study baseline (≥ 3 months post-concussion) and repeated at 12 weeks follow-up in patients attending a tertiary care clinic, randomized to an intervention group ($n=22$) and control group ($n=24$). The intervention consists of 3 e-learning modules administered at study baseline, 6, and 12 weeks. Data collected from both groups included The Rivermead Post Concussion Symptoms Questionnaire (RPQ), the Participation Assessment with Recombined Tools-Objective (PART-O) questionnaire, Quality of Life after Brain Injury – Overall Scale (QOLIBRI-OS) questionnaire and healthcare utilization. Paired t-tests were used for normally distributed data while the Wilcoxon signed-rank tests were used for nonparametric data.

Results

Changes in RPQ scores were not statistically significant in either study arm nor when stratified by sex or symptom category. Statistically significant decreases in health service utilization were observed for family doctor and rehab visits in the intervention group and alternative therapy in both groups. Participants in the intervention group returned to their baseline community activities, (productivity, social relations, and averaged and balanced total scores) whereas the control group did not (all $p < 0.037$). Over the study period, we observed a trend toward improved quality of life in the intervention group compared to the controls (all $p > 0.05$).

Conclusion

Despite the small sample size, our findings support improvements in community engagement and quality of life associated with the e-learning modules among patients experiencing persistent post-concussion headache.

Y. S.

Public Health Agency of Canada – Global Health and Guidelines Division

The practicum student worked with the Global Health and Guidelines Division in the Centre for Chronic Disease Prevention and Health Equity at the Public Health Agency of Canada. The division provides scientific and methodological to the Canadian Task Force on Preventive Healthcare, an external group of clinical experts that develops evidence-based guidelines used by Canadian primary care providers.

The student worked on two main projects. The first was a GRADE Evidence to Decision framework on pharmacological interventions for smoking cessation. The student drafted recommendations by interpreting results from a systematic review on the benefits and harms of the interventions, integrating insights from meetings with clinical experts, and synthesizing information on the resource requirements, cost-effectiveness, equity implications, acceptability, and feasibility of the interventions. The framework will support a clinical practice guideline on smoking cessation.

The second project was a cross-sectional analysis of predictors for current cigarette smoking and smoking cessation in Canadians using the 2017 Canadian Tobacco, Alcohol and Drugs Survey. The student developed an analysis plan, obtained data from Statistics Canada, formatted and analysed data using SAS, and summarised results in a written report.

In addition to the two core projects, the student actively participated in training opportunities, including GRADE training and the first two levels of the International Guideline (INGUIDE) Credentialing and Certification Program. This training enhanced the student's knowledge of systematic review methods, critical appraisal, and guideline development and implementation.

Overall, the practicum provided valuable learning opportunities in guideline development and health research methodology, as well as an introduction to a range of preventative healthcare topics, including smoking cessation and cardiovascular disease prevention.