Summer Student Research Program
Project List 2018

**List updated:** February 8, 2018

***Please keep checking the website as this list may be added to until the deadline***

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Supervisor: Dr. Mary De Vera

Project Title: A Qualitative Descriptive Study of Consumer Perspectives on Smartphone Medication Adherence Apps: A Content Analysis of User Reviews

Project Description

Background: For many patients living with lifelong diseases, managing conditions and taking medications as prescribed (“adherence”) is a challenge. Indeed, medication non-adherence has been declared by the World Health Organization as an epidemic, costing billions of dollars in wasted health care resources. There is surging interest on the applications of electronic health (eHealth) technologies – the transfer of health resources, care, and information by electronic means – in addressing medication non-adherence. With ubiquitous cellular phone use and ease of accessibility, smartphone apps may represent valuable tools to supporting patient adherence.

Project Overview: The proposed SSRP project is part of a research program on understanding how eHealth technologies can help support patients with adherence to their medications. In a prior SSRP, our group found over 700 smartphone adherence apps available for Apple and Android platforms. Building on this prior work, the objective of this project is to obtain an understanding of consumers’ perspectives of these apps by applying qualitative research approaches to publicly available, online consumer (user) reviews.

Methods:

Data Extraction: A priori, we will select 10 apps from the Apple and Android platforms for inclusion in the qualitative study. Consumer reviews over the past year will be extracted into Word documents and imported into NVivo 11 (QSR International).

Analysis: The qualitative descriptive study will involve content analysis as follows:
- open coding or labelling concepts identified in reviews
- construction of subcategories and categories or grouping and organizing codes into these higher levels
- abstraction in themes or interpreting relationships between constructed categories

Reporting: Constructed themes and categories will be summarized into appropriate tables and where relevant, figures, with supporting quotes

Role of the Summer Student: The summer student will work closely with the supervisor and research coordinator to complete the project. The summer student will be responsible for extracting reviews, conducting qualitative analyses, and reporting of results.
Supervisor(s): Dr. Mary De Vera

Project Title: Perinatal Patterns of Medication Use in Women with Inflammatory Arthritis

Project Description

Background: Inflammatory arthritides are a group of inflammatory, chronic diseases that are far more prevalent among women than among men. Not just a disease of old people, most devastating arthritides strike women during their reproductive years. A prominent example is systemic lupus erythematosus (SLE), an autoimmune disorder which affects 1 to 4 per 1,000 women, with peak age at onset during childbearing years. In rheumatoid arthritis (RA), peak onset occurs during the 4th and 5th decades of life but studies report a substantial proportion of women between 16 and 40 years are affected, thus the disease also impacts reproduction. Though less-studied than SLE and RA, spondylarthropathies (SpA) - such as ankylosing spondylitis (AS) and psoriatic arthritis (PsA) – and juvenile idiopathic arthritis (JIA) also represent important types of arthritis that occur in women of childbearing age. Given the occurrence of pregnancy in arthritis, it is important to understand associated clinical and therapeutic challenges. One of these challenges is limited information on medication safety, particularly immunomodulatory therapies that are used to control disease activity in IA.

Project Overview: The proposed SSRP project is part of a population-based research program on understanding the perinatal impacts of arthritis medications. The specific objectives are to evaluate the patterns of use of arthritis medications – namely disease modifying antirheumatic drugs (DMARDs) – before, during, and after pregnancy in women with inflammatory arthritis.

Methods

Study Design: Retrospective, longitudinal cohort study using an established population-based pregnancy cohort of women with inflammatory arthritis.

Data Source and Cohort: The project will utilize Population Data BC (PopData), an extensive data resource that contains all BC Linked Health data for applied health services and population health research covering the entire population of BC (estimated 4.7 million residents, January 2016) including files on all provincially funded health care professional visits, hospital admissions and discharges, interventions, investigations, demographic data, and vital statistics since 1990. These data are linked to the comprehensive prescription drug database, PharmaNet, which captures all prescriptions dispensed in community pharmacies, since 1996. These data were linked to the BC Perinatal Database Registry (BCPDR), which contains antenatal, intrapartum, and postpartum maternal and infant data abstracted from medical records for 99% of births in BC, regardless of the place of delivery.

Definition of Inflammatory Arthritis: From the source population, we identified a cohort of women with inflammatory arthritis (including RA, PsA, AS, JIA, and SLE). Each woman and their pregnancies were included if they had ICD-9/10 codes for a specific autoimmune disease in any of the diagnostic coding fields from either their physician visits data or hospital separations, on ≥ 2 occasions at least 60 days apart and within two years, any time prior to the date of delivery.
**Assessment of DMARD Use:** We will use drug identification numbers in the PharmaNet database to identify DMARDs. We will describe use in the 12 months before, during, and the 12 months after pregnancy. Start and end dates for pregnancies will correspond to the last menstrual period and date of delivery, respectively, from the BCPDR. The period of pregnancy will be further described according to first (weeks 1 to 13 of gestation), second (weeks 14 to 26 of gestation), and third (week 27 of gestation to delivery) trimesters. For all periods, we will describe DMARDs use according US Food and Drug Administration risk category. We will describe patterns of use including specific drugs, dosage and frequency.

**Role of the Summer Student:** The summer student will be trained on use of appropriate statistical analyses software to: 1) generate analytic datasets; and 2) conduct statistical analyses. The summer student will regularly meet with the supervisor to discuss and project and will also receive support from the research team, including statistician during the project term.
Supervisors: Drs. Fawziah Lalji and Gina Ogilvie

Project Title: Epidemiology of Genital Warts in British Columbia

Background: HPV is a large family of viruses and approximately 40 of these are transmitted sexually. Of these forty HPV subtypes, 15 are considered high-risk and can lead to the development of cervical cancer. The other subtypes of HPV are considered low-risk and include types 6 and 11 which cause condyloma acuminatum or anogenital warts (AGWs). Genital warts remain one of the most commonly reported sexually transmitted infections worldwide. Recurrence is common and many patients receive several rounds of treatment. Two vaccines have been developed to protect against HPV disease: Gardasil® (Merck Frost) and Cervarix® (GlaxoSmithKline). Both vaccines contain HPV types 16 and 18, the high-risk serotypes associated with cervical cancer, but Gardasil® provides additional protection against genital warts as it also protects against HPV types 6 and 11. We had previously evaluated the incidence of genital wart infections back in 2003 prior to the introduction of the Human Papilloma Virus (HPV) vaccine as part of the grade 6 immunization program.

Rationale: We would like to take a look at the incidence of this infection since the introduction of the vaccine program in British Columbia. Many of the girls who would have been vaccinated are now young adults fully engaged in sexually activity. Of note, the vaccine has been privately available to adult women with variable uptake through pharmacies. We can evaluate its uptake and impact on incidence of AGW.

Objectives: We will use administrative data to report on trends in incidence of AGW from 1998 to 2016, by age, gender and anatomical area in the pre-vaccine and during vaccine-availability time period.

Study Design and Cohort: A retrospective cohort analysis with the cohort being patients with AGW infections between January 1, 1998 to December 31, 2016. The cohort will include all patients in BC diagnosed with an AGW infection from 1998 to 2016. Individuals will be eligible for inclusion in the cohort if they have a record in MSP with ICD-9 code of 078.1 or DAD with an ICD-10 code for ICD9: 078.1 or ICD-10: A63, B07.


Student Qualifications: Student should be familiar with epidemiological methods and to be able to use/understand R or SAS for data analysis, with the assistance of epidemiologists and biostatistician.
Summer Student Research Program Project Description
SSRP-Lynd-01

**Supervisor:** Dr. Larry Lynd (Director, Collaboration for Outcomes Research and Evaluation; Professor, Faculty of Pharmaceutical Sciences)

**Project Title:** Forecasting the Utilization of Genomic Sequencing in Healthcare by 2030

**Project Description:** Together with researchers at UBC’s Faculty of Medicine and BC Children’s and Women’s Hospitals, we are conducting a needs assessment for genetic counselling services and evaluating innovative service delivery models that can scale up to accommodate the expected increase in the utilization of genome-wide sequencing over the next 10 years. To inform this project, we are conducting an *environmental scan of the medical genetics landscape*, which will help us to forecast future utilization of genome-wide sequencing in healthcare and the associated demand for genetic counselling, as well as to estimate the health system’s capacity to deliver appropriate genetic counselling services.

**Project Objectives:** The starting point for this project is to conduct *scoping reviews* that will identify and synthesize peer-reviewed articles, reports, and relevant data sources that provide information on: 1) the composition and evolution of the medical genetics workforce, 2) the therapeutic areas and indications for which genetics services are currently offered, 3) trends in the utilization of genetics services, and 4) forecasts of how the medical genetics landscape is likely to change in the next 10 years.

**Project Activities:** The project will involve: 1) conducting background research to identify appropriate literature and data sources; 2) developing a search and synthesis strategy for the scoping reviews; 3) designing the search terms used in queries; 4) evaluating individual documents and data sources for relevance; 5) summarizing and abstracting relevant documents and data; 5) documenting the methodology used to conduct the reviews; and 6) drafting reports summarizing the key trends and statistics identified by the reviews. The student will provide input at all stages of the project, and will work closely with the study team to design a search and evaluation strategy. Once the methodological approach for the reviews is established, the student should be able to work with minimal direct supervision under these guidelines while exercising sound judgment on when to refer problems to the supervisor. The student will be offered co-authorship on the publications that report the results of the scoping reviews.
Summer Student Research Program Project Description
SSRP-Pachev-01

Supervisors: George S Pachev1, Neelam Dhaliwal2, Natalie E LeBlanc1, Simon P Albon3
1Office of Educational Assessment
2Office of Experiential Education
3Office of Educational Support and Development

Project Title: Learning Opportunities in Pharmacy Practicum Settings

Project Description

Goal: The goal of this study is to identify, through individual and group interviews with students, the situations and conditions conductive to learning (“learning moments”) in outpatient and inpatient direct patient care, as well as non-direct patient care practice settings.

Background: The Canadian Council for Accreditation of Pharmacy Programs (CCAPP) has more than doubled the time requirements for experiential education within the entry-to-practice (E2P) curricula (1). The UBC Faculty of Pharmaceutical Sciences’ E2PPharmD curriculum, implemented in September 2015, involves 42 weeks of experiential education in various pharmacy practice settings. The experiential education practicums are included in all four years of the program, and progress from introductory to advanced learning opportunities from the first to the final year. The practicums involve both direct patient care in outpatient and inpatient settings, as well as non-direct patient care in a variety of settings.

Given that the vast majority of students entering the program have no relevant practice education experience, it is important to provide support for student learning in practicum settings. Learning how to learn in the practice-based environment is a central topic in preparing students for experiential learning. Identifying the opportunities for learning, is a first step in building necessary supports.

Research questions: What are the situations and assigned activities within the daily routines of the practicum placement that are most conductive to learning? What are the associated conditions necessary for learning to occur? What are the preparation and/or follow-up activities needed to consolidate learning, if any?

Project activities: This project will involve the student in the following activities:
1. Literature review: searching the scholarly literature in health sciences on learning in experiential education settings to identify relevant theoretical models, empirical approaches and examples of learning opportunities in practicum placements. Complete a written review of the literature.
2. Data collection: design data collection protocols, including developing and piloting the data collection instruments. The successful candidate will gain experience in the development and administration of questionnaires, interviews and focus group questions.
3. Ethics approval: preparing documentation for submission to the Institutional Research Ethics Board, including letters of initial contact and consent forms.
4. Dissemination of results: creating and developing a poster and seminar for presentation to the Faculty and other audiences, and participating in the preparation of a manuscript suitable for publication.

The student undertaking this project will be expected to work effectively within general guidelines but with minimal direct supervision and to have excellent verbal and written communication skills.

(1) Accreditation Standards for the first Professional Degree in Pharmacy Programs, The Canadian Council for Accreditation of Pharmacy Programs (CCAPP), 2018.
Supervisor: Dr. Colin Ross

Project Title: Development of novel strategies for therapeutic genome editing.

Project Description

Background: Genome sequencing has aided our ability to understand and diagnose genetic diseases and cancer. However, less than 5% of human genetic diseases have approved treatments. Previously, gene therapies have focused on the treatment of genetic diseases by inserting functional copies of a gene into patient cells. While this approach has been successful, critical limitations remain.

Project Overview: To overcome these limitations, we are developing novel therapeutics that specifically repair errors directly in the DNA to correct disease-causing mutations. To optimize this approach, we are developing in vitro and in vivo model systems to evaluate nanotechnology-based approaches to deliver therapeutic components into cells.

Methods: This project will require UBC biosafety and chemical safety training. The project involves lab-based molecular biology techniques, imaging, and bioinformatics-based analyses. In addition, the project will require quantitative data analyses and the application of statistics to summarize laboratory findings. Finally, the project will require detailed presentations of findings in weekly lab meetings and reporting of project findings.

Role of the Summer Student: The summer student will work closely with the supervisor, research associates/postdoctoral fellows and graduate students to complete the project. The research will involve significant laboratory-based research involving bacteria and mammalian cell lines. The summer student will be expected to participate in weekly lab meetings and prepare a final report and poster presentation.
Supervisor: Dr. Mohsen Sadatsafavi

Project Title: Health care services use in undiagnosed Chronic Obstructive Pulmonary Disease

Project Description

Background: Chronic obstructive pulmonary disease (COPD) is a chronic disease of the airways that is associated with symptoms such as shortness of breath, cough and sputum production, as well as progressive lung function decline. COPD is a highly prevalent disease; in 2014, there were 804,043 cases of diagnosed COPD in Canada, however, an estimated two-thirds of patients with COPD in Canada have not received a physician diagnosis. Health-care utilization in patients with undiagnosed COPD tends to increase in the two years prior to an initial diagnosis of COPD(56), suggesting that there are missed opportunities for an earlier diagnosis in these patients. A prompt diagnosis of COPD can enable early disease management to preserve lung function, help prevent future adverse outcomes such as COPD exacerbations, and decrease the burden of this very common disease on our health-care system.

Project Objective: To compare the type and amount of health-care services use in undiagnosed COPD patients and non-COPD patients in order to determine the resource burden of undiagnosed COPD and inform opportunities for earlier detection of these patients.

Methods: This project will use data from the Canadian Cohort of Obstructive Lung Disease (CanCOLD), which was a population-based longitudinal study of COPD in Canada. CanCOLD participants were assessed at three visits 18-months apart. Participants reported their health care utilization, sociodemographic information, smoking history, current smoking status, and comorbidities using validated questionnaires. Diagnostic spirometry was performed at each visit and participants had undiagnosed COPD if they met the spirometric definition of COPD but did not report a previous diagnosis of COPD, emphysema, or chronic bronchitis. Three outcomes will be defined for participants: 1) the number of outpatient visits (generalist and specialist), 2) the number of emergency room visits, and 3) the number of hospitalisations between visits. In sub-group analyses, each outcome variable will be further divided into all-cause vs. respiratory-related visits. Generalized linear mixed-effect models will be used to compare the number of health care service events between patients with undiagnosed COPD and non-COPD subjects in order to quantify the excess burden of undiagnosed COPD. The influence of socio-demographic variables, comorbidities, symptoms, current smoking status and pack-years of smoking history on health-care service use in both groups will also be assessed.

Role of the summer student: The summer student will be responsible for creating the analytic dataset, cleaning the data if needed, and conducting the statistical analyses. The student will be trained in the necessary statistical and computer programming skills by the supervisor and graduate students/staff. The student will be expected to prepare a manuscript and poster presentation summarizing the findings by September 2018.