

Capstone for Impact Submission | GY2020

Project Title: Identifying Disparities in the Treatment of Adolescent Knee Pain: Evaluation of a Nationally Representative Database of Outpatient and Emergency Visits

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Branch: Procedure Based Care

Path of Excellence: Innovation and Entrepreneurship

If this project can be continued by another UMMS student, please include your contact information or any other details you would like to share here:

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Summary: Health disparities and structural discrimination are often propagated without intentionally targeting a specific group. Previous survey-based studies have demonstrated difficulty in obtaining appointments at orthopaedic surgery outpatient clinics for children insured with Medicaid or state-sponsored CHIP programs. This study is intended to utilize data from a large, nationally representative database for the purpose of analyzing whether disparities in care exist across demographic groups, including those based on race and payment status.

Methodology: This was a secondary analysis of the data within the publicly available, National Center for Health Statistics (CDC) administered National Ambulatory Medical Care Survey (NAMCS; outpatient/ambulatory visits) and National Hospital Ambulatory Medical Care Survey (NHAMCS; emergency department visits). Surveys from 2011-2016 were included. Analysis was limited to patients younger than 18 years with presenting complaints specifically coded for knee symptoms. All visits for fractures and dislocations were excluded. All statistical analyses were conducted with Stata (v. 16) and calculations were adjusted to account for the clustered survey design. Strata with singular observations were treated as certainty units. A significance level of $p < 0.05$ was used throughout.

Results:

A total of 3,278,400 visits to primary care physicians (pediatrics, internal medicine, and family medicine) and 3,619,500 visits to orthopaedic surgeons were included. For comparison, 2,381,400 visits to emergency rooms for similarly coded complaints occurred within the same time period. In the primary care setting, patients insured by Medicaid represented 34.9% of visits, compared to 13.3% in the orthopaedic setting and 50.9% in ERs. In the orthopaedic setting, imaging was used much more frequently in treatment than in the primary care setting (58.5 % vs 20.7 %, respectively; $p < 0.001$). When looking at Medicaid patients in the orthopaedic setting, imaging was used at as similar rate as private insurance patients (52.3% vs 59.4%; $p = 0.631$), though MRI was used more frequently in private insurance patients (5.4% vs. 22.9%; $p = 0.0017$). In the primary care setting, non-white patients were referred to specialists more frequently than white patients for both private

insurance and public insurance. Yet, white patients represent a substantial majority of orthopaedic patient visits (93.4 %).

Conclusion:

For adolescents presenting with knee symptoms, patients with Medicaid insurance are under-represented in the orthopaedic setting compared to primary care and emergency departments. Data for specialist referral indicates that Medicaid patients are referred at a similar rate to patients with private insurance. Further research is needed to determine what barriers exist for Medicaid patients seeking orthopaedic appointments.

Reflection/Impact Statement:

You may use the following questions to guide your reflection:

1. How did the process of conducting this research confront any limitations of your prior thinking?
2. Who could potentially benefit from this CFI project over different timescales and how?
3. What actions will you take afterwards to continue the momentum of this project, and maximise the likelihood of the identified benefits being achieved?
4. What advice would you give to another student completing their CFI?

When approaching this project, I had limited previous experience working with a large databases. Though I had some exposure as an M1 student (mainly led by the statistician on the project), I was lacking the skills to use software or work through any detailed statistical calculations. Entering the branches, I noted a goal of building a new project from this previous experience, working to develop my research skills through a health disparities project utilizing a large database. Though this project did not come to fruition until the late months of the branches, I ultimately was able to build some proficiency with Stata software and gain exposure to the statistical concerns inherent in utilizing a large database.

If there was a student who is interested in further research with this database, I have created several Stata “do-files” that would serve as a launching point for additional research. I have attempted to annotate many sections of these files, so that individuals unfamiliar with Stata would be able to see exactly what each command is intended to do.

My ultimate goal is to turn this project into a completed manuscript. To reach that goal, I need to incorporate some earlier years of the surveys that I am utilizing, to expand my dataset. Though I am reasonably confident this will not change any of the conclusions, I want to ensure that the variance in some of my smaller analyses is accounted for. In my opinion, research that deals with sensitive topics such as race, insurance status, and other topics relating to disparities should be approached with care, as unintended errors can lead to unfair conclusions. This is especially a risk with database studies, where the findings can easily be interpreted outside of the ideal context in which the case report forms were completed and entered into the database.

Looking back at my time in the M3/M4 curriculum, I would recommend a student to use the early parts of the branches to solidify their career plans. If there is a long-term area of interest, finding an intersection between this interest and intended specialty would be a great way to embark on a CFI that is both impactful and useful for a student’s future (i.e. for discussion on residency interviews). Though this is ultimately what happened for me, I would have liked to have made more substantial progress prior to beginning interviews. However, working on the project is also an effective use of the (inevitable) downtime that occurs during the interview trail.