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The Correlation Between Social Work Encounters and Health Outcomes in Children with Cystic Fibrosis

Child Health Research Institute

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Background and Hypothesis

- Cystic Fibrosis (CF) is defined by the Cystic Fibrosis Foundation as a progressive, genetic disease that affects the lungs, pancreas, and other organs.
 - CFTR gene mutation → improper Cl⁻ transmembrane conductance
 - Mucus buildup = infections and inhibited enzyme secretion
 - Infection = exacerbation treated by antibiotics
- Coordinated care is used at Children's Nebraska
 - Customized multidisciplinary team approach
- Socioeconomic factors = barriers to health
 - Inability to devote time/resources to treatment
- Social work (SW) bridges the gap for those who experience socioeconomic disparities
 - Help patients deal with emotional, social, and financial aspects of living with CF
- Low socioeconomic status correlated with poor health and high social work encounters

Hypothesis:
 An increased number of social work encounters is an indicator of poor health in children with cystic fibrosis.

Methods

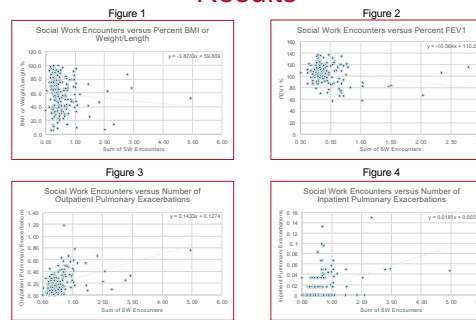
- June 1, 2019 – June 1, 2024 (or birth to June 1, 2024)
- Database compiled from EPIC
 - Physical information: age (months and years), mutation (homozygous, heterozygous, or other), BMI (or weight/length) percentile and z-score, %FEV1, modulator (if applicable), visits to CF clinic, outpatient pulmonary exacerbations, and inpatient pulmonary exacerbations
 - Exacerbations counted as number of antibiotic courses between study dates, excluding MMF Ayrthromycin, or number of hospitalizations for CF
 - Social factors: food, housing, or transportation insecurity, education, prior CPS involvement, patient/caregiver mental health qualitatively and with PHQ-9/GAD-7 (>age 11), language barriers, and insurance type
 - Social work encounters = clinic + patient outreach + inpatient
- All values were adjusted for age by months
- Statistical analysis by t-test was conducted to check for the significance of findings

Demographics

Table 1 Patient Demographics	
N	193
Male	106 (55%)
Female	87 (45%)
Homozygous Mutation (delta/delta)	111 (58%)
Heterozygous Mutation (delta/other)	70 (36%)
Other Mutation (other/other)	12 (6%)
0 to 2 years	29 (15%)
3-6 years	23 (12%)
7-12 years	49 (25%)
13-18 years	61 (32%)
>18 years	31 (16%)
Public Insurance	95 (49%)
Private Insurance	79 (41%)
Multiple Insurance	18 (9%)
No Insurance	1 (1%)

Table 1 shows demographic information for the patients whose information was used in the data set. Information is given on sample size, biological sex, cystic fibrosis mutation type, age, and type of insurance.

Results

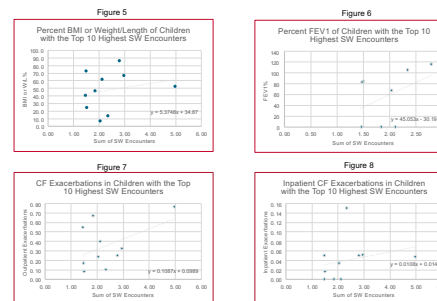


Figures 1-4 depict scatterplots of the BMI% (or length/weight %), %FEV1, outpatient pulmonary exacerbations, and inpatient exacerbations plotted against social work encounters for all patients. Linear lines of best fit, as well as equations, have been added to each figure.

Table 2

T-Test Scores		
	All Patients	Top 10 SW Encounters
SW/BMI (or W/L) %	3.34E-118	3.65E-07
SW/FEV1%	7.64E-237	9.72E-02
SW/Exacerbations	7.81E-17	9.46E-04
SW/IP Exacerbations	3.14E-37	7.56E-18
Critical T-Scores		
	All Patients	Top 10 SW Encounters
T(critical)	1.984	2.101

Table 2 shows the t-scores for a comparison of social work encounters with BMI% (or length/weight %), %FEV1, outpatient pulmonary exacerbations, and inpatient exacerbations for all patients and for patients with the top 10 most social work encounters. Table 3 shows the t-critical values for these two sets of patients.



Figures 5-8 depict scatterplots of the BMI% (or length/weight %), %FEV1, outpatient pulmonary exacerbations, and inpatient exacerbations for the patients with the top 10 most social work encounters. Linear lines of best fit, as well as equations, have been added to each.

Conclusions

- By considering figures 1-4, it can be deduced that the number of social work visits is suggestive of health
 - High encounters = lower BMI and FEV1 (-)
 - High encounters = higher number of exacerbations (+)
- Statistically, however, this is not significant
 - Accept the null hypothesis that there is no significant impact of social work encounters on health markers
- In patients with the top 10 most SW encounters, exacerbation trends remain consistent
 - FEV1 and BMI trends appear in the inverse (+)
- Hypothesis disproven
 - Perhaps due to social workers improving health by providing support and resources

Limitations

- With limited time to conduct this research, not all pertinent information could be collected from EPIC
 - For instance, more information about health history or mental health could have been gathered with more time
- The size of the database was likewise limited by the access to only Children's Nebraska records
 - A study involving multiple hospitals and CF clinics would give a fuller understanding
- My positionality as a student limited access to patients
 - Interviews with patients would likely be an asset to future research

Suggestions for Future Research

- Further research is required to deduce why the %FEV1 and BMI (weight/length) % were inverted for the top 10 SW encounter patients
 - Is there significance to this? Random occurrence?
- Research with a standardized age set would allow for a more controlled experiment
 - Treatments, encounters, and health vary with age of children
- A study with greater SW involvement would be good to contrast to the findings of this project

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