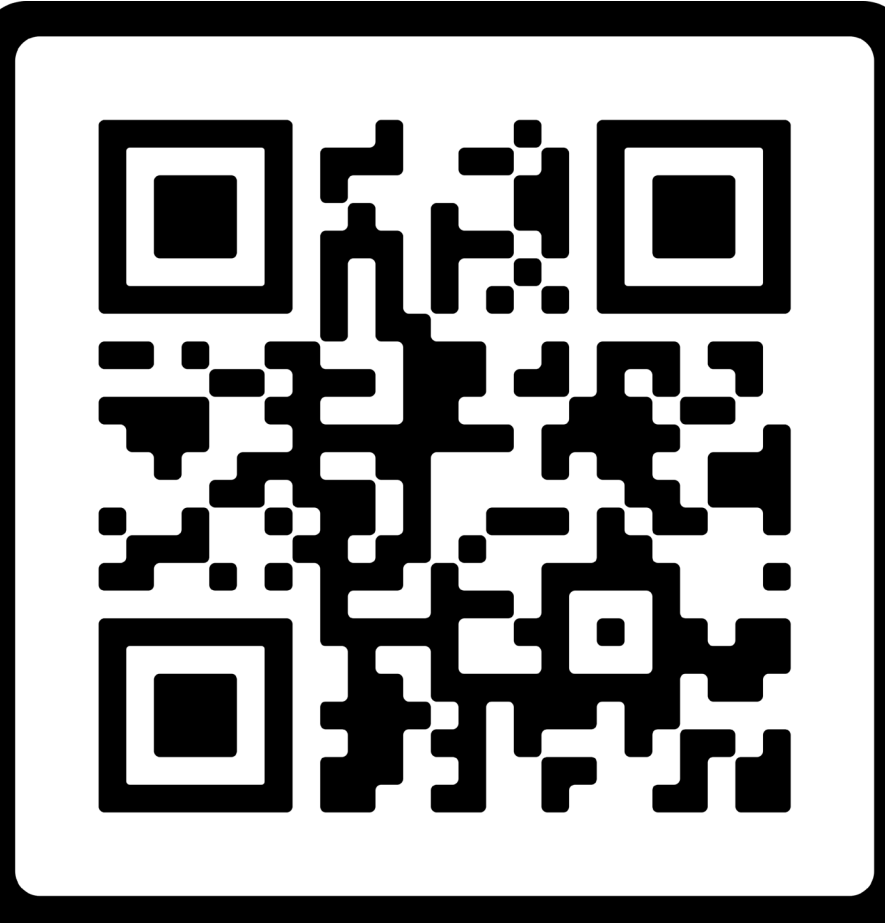


Engagement with Case Management Reduces Emergency Department Visits for Asthma

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Background

- Over 5.5 million children in the United States have asthma, leading to 1.6 million Emergency Department (ED) visits annually.¹
- 56 billion dollars per year are spent on asthma.²
- Lower socio-economic status patients are disproportionately affected.³⁻⁴
- Case management interventions have been proven to create personal relationships and reduce disparities resulting in decreased return ED visits and hospitalizations, reduced utilization cost, and increased quality of life measures.⁵⁻⁸

Objectives and Hypothesis

Primary Objective: Determine the effect of subject engagement with case management and asthma specialty care on the rate of ED visits due to asthma exacerbations in a population with frequent ED utilization.

Secondary Objectives:

- Evaluate the effect of case management and asthma specialty care on overall number of asthma exacerbations.
- Compare and contrast demographic factors associated with asthma outcomes
- Ascertain if any factors predisposed patients to engage with case management.

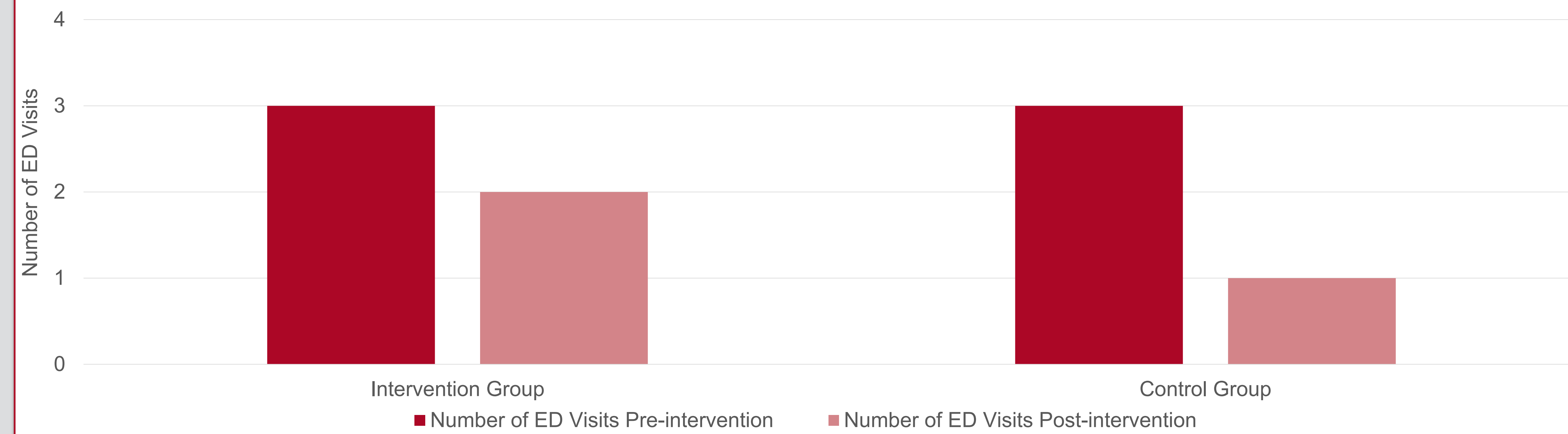
Hypothesis: Subject engagement with case management and specialty care will decrease the number of asthma-related ED visits for patients in the intervention group.

Table 1: Study Population Characteristics

Characteristic	Intervention group n=29	Control group n=41	P-value
Sex-no. (%)			
Male	15 (51.7)	24 (58.5)	.374
Race/Ethnicity-no. (%)			
White	9 (31.0)	6 (14.6)	.062
African American	12 (41.4)	18 (43.9)	
Hispanic	1 (3.4)	10 (24.4)	
Other	7 (24.1)	7 (17.1)	
Median Family Income by Zip code-no. (%)			
> \$51,784	9 (32.1)	20 (48.8)	.064
\$51,784 > \$58,847	5 (17.9)	13 (31.7)	
\$58,847 > \$72,204	8 (28.6)	4 (9.8)	
\$72,204 >	6 (21.4)	4 (9.9)	
Patient Coverage-no. (%)			
Medicaid	20 (69.0)	32 (78.0)	0.217
Commercial	9 (31.0)	7 (17.1)	
No insurance	0 (0.0)	2 (4.9)	
*Smoke Exposure-no. (%)			
Passive	6 (20.7)	1 (2.4)	.002
No Exposure	21 (72.4)	25 (61.0)	
Not assessed	2 (6.9)	15 (36.6)	
Age-no. (range)			
Median	5 (2-17)	5 (2-15)	.606
*Type of Intervention-no. (%)			
Face-to-face	22 (75.9)	16 (39.0)	.002
Time of ED Visits-no. (%)			
7am-11pm	24 (82.8)	29 (70.7)	.192
ED Visits by Week/Weekend-no. (%)			
During week	22 (75.9)	27 (65.9)	.368
ED Visits by Month-no. (%)			
November-April	17 (58.6)	24 (58.5)	.994
Number of New OCS Prescriptions-no. (%)			
0-1	13 (44.8)	23 (56.1)	.353
>= 2	16 (55.2)	18 (43.9)	
Number of New ICS Prescriptions?no. (%)			
Yes	4 (13.8)	3 (7.3)	.374
CHMC Primary Care Provider?no. (%)			
Yes	16 (55.2)	19 (46.3)	.467

Results

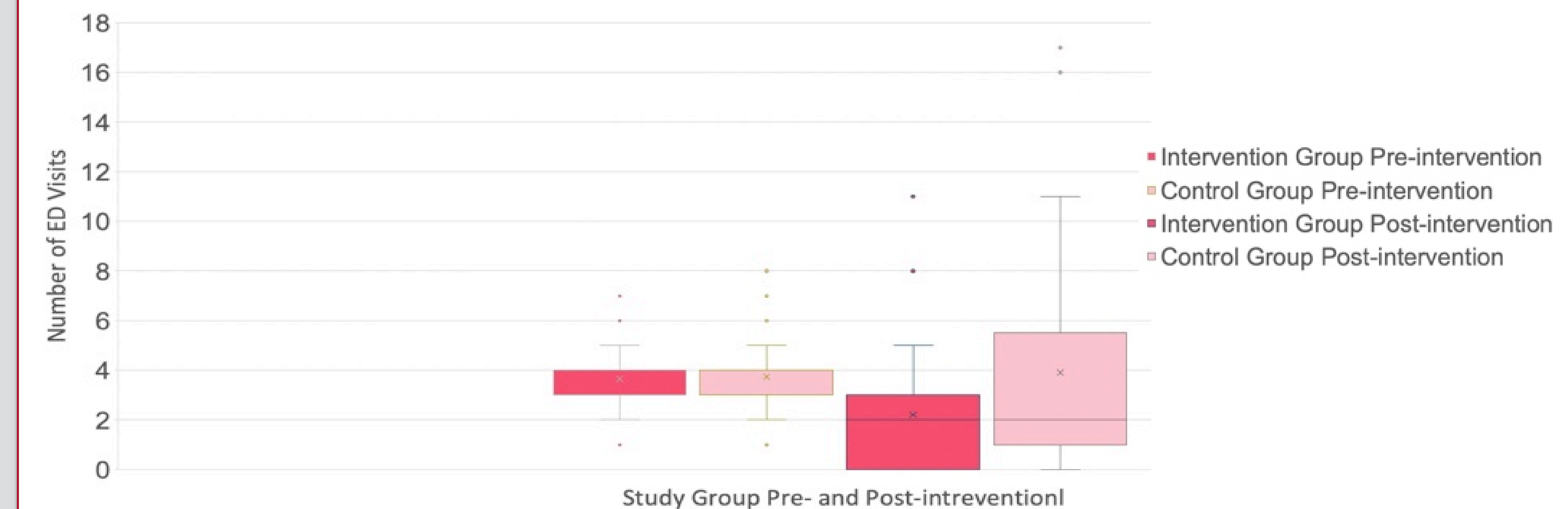
Figure 2: Study Groups' Median Difference in ED Visits for Asthma Exacerbation in the 12 months Pre- and Post-intervention.



In Figure 2, both groups had a median of three visits in the 12 months pre-intervention. The intervention group had a significant difference of two visits after the intervention ($p=.001$), but the control had no significant difference ($p=.316$) indicating case management engagement with specialty care reduces ED visits (McNemars Test)

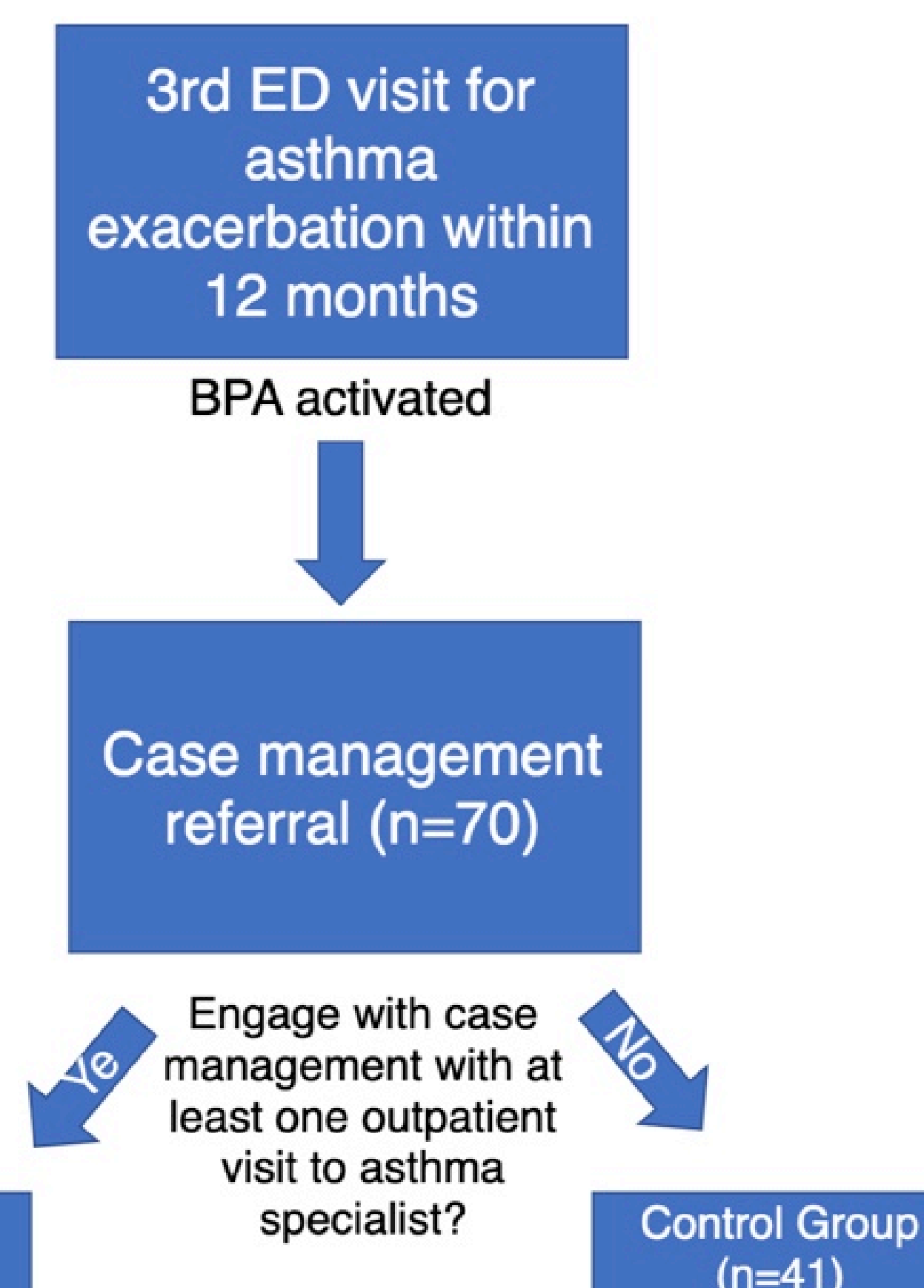
Figure 3 demonstrates the mean (X), median (--), and range of ED visits in relation to the standard deviation pre- and post-intervention. There was no significant difference between the two groups. ($p=.989$, McNemars Test)

Figure 3: Number of ED visits 12 months Pre- and Post-intervention Box and Whisker Plot



Methods

Figure 1: Subject Recruitment



Study Design:

- Third ED visit for asthma exacerbation within 12 months activated a Best Practice Alert (BPA) at Children's Hospital and Medical Center (CHMC). Case management met with subjects and facilitated referral to specialty care.
- Number of ED visits, oral and inhaled corticosteroids (OCS/ICS), asthma control scores, pulmonary function tests, day/time of ED visit, and demographics were accessed via the electronic health record (EHR) in ED.

Statistical methods:

- Prospective cohort design, descriptive stats analysis (Chi Square, anova, or non-parametric KWallace Test for non-normal continuous variables), and paired analysis (McNemars Test).

Discussion

- Paired analysis demonstrated that the intervention group had fewer ED visits 12 months after case management with specialty care compared to the 12 months prior, while the control group experienced no significant change in the number of ED visits (Figure 2).
- Engagement with case management was significantly higher in subjects whose initial encounter was face-to-face and in those with passive smoke exposure.
- Smoke exposure is a significant trigger for asthma exacerbations; however, smoke exposure was not assessed consistently in the ED.
- Limitations in this study included self-selection bias and only using CHMC EHR to obtain data.

Conclusion and Future Directions

- Engagement with case management and asthma specialty care reduced ED visits in the intervention group.
- Face-to-face encounters with case management should be the preferred contact method in the ED.
- Future studies should document and address smoke exposure in the ED
- Future studies are needed to determine the long-term efficacy of face-to-face case management and specialty care on asthma patients.

Acknowledgements

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