Tailored Adherence Incentives for Childhood Asthma Medications: A Randomized Clinical Trial

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Importance: Differential adherence to efficacious preventive medications is one potentially modifiable driver of racial disparities in childhood asthma outcomes.

Objective: To determine the effect of a financial incentive-enhanced intervention on adherence to inhaled asthma preventive medication in a high-risk, predominantly racially minoritized cohort of children with asthma.

Design, setting, and participants: This was a randomized clinical trial conducted from September 2019 through June 2022 at a large mid-Atlantic pediatric health system in the US. Children were eligible if they were between 5 and 12 years old, prescribed a preventive inhaler for daily use, and had at least 2 asthma exacerbations requiring systemic steroids in the preceding year. Data were analyzed from December 2022 to December 2024.

Intervention: Inhaled medication use was monitored using electronic inhaler sensors over a 7-month period. Families who completed a 1-month run-in interval were randomized to 1 of 3 arms for a 3-month experiment interval: (1) daily text message medication reminders, weekly adherence feedback, and gain-framed, financial incentives of up to $1 per day (full intervention); (2) daily text message medication reminders and weekly adherence feedback (hybrid intervention); or (3) no reminders, feedback, or incentives (active control). Medication adherence monitoring then continued for a 3-month observation interval, where all arms reverted to active control conditions.

Main outcomes and measures: The primary outcome was adherence to inhaled maintenance medication during the experiment; secondary outcomes included adherence during the observation phase. The study was powered to detect a difference in average monthly adherence between the full intervention and active control condition.

Results: Of the 106 children randomized, 99 had at least 1 month of monitoring data (56 male [57%] and 43 female [43%]; mean [SD] age, 8.0 [2.3] years). Most participants (81 [82%]) identified as non-Hispanic Black and demographic and clinical characteristics were similar across study arms. During the experiment interval, participants receiving the full intervention had a 15-percentage point (95% CI, 2-29 percentage points) higher inhaled maintenance medication adherence compared with participants in the active control. There was no evidence of adherence differences in the observation interval.

Conclusion and relevance: While a financial incentive-enhanced mobile health intervention led to higher inhaled preventive medication adherence as compared with the active control group, there was no evidence for enduring effect after the intervention components ceased, consistent with other studies that include financial incentives to encourage behavior change.

Journal:

JAMA Pediatrics

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