

WEIGHT OF COMPLEXITY: THE PREVALENCE, CAUSES, & SOLUTIONS TO MALNUTRITION IN COMPLEX CHRONIC ILLNESS

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INTRODUCTION

UNDERSTANDING FAILURE TO THRIVE (FTT) & CHILDREN WITH MEDICAL COMPLEXITY (CMC)

CMC experience FTT disproportionately due to diverse feeding challenges and caloric requirements [5,7].

FTT is characterized by:

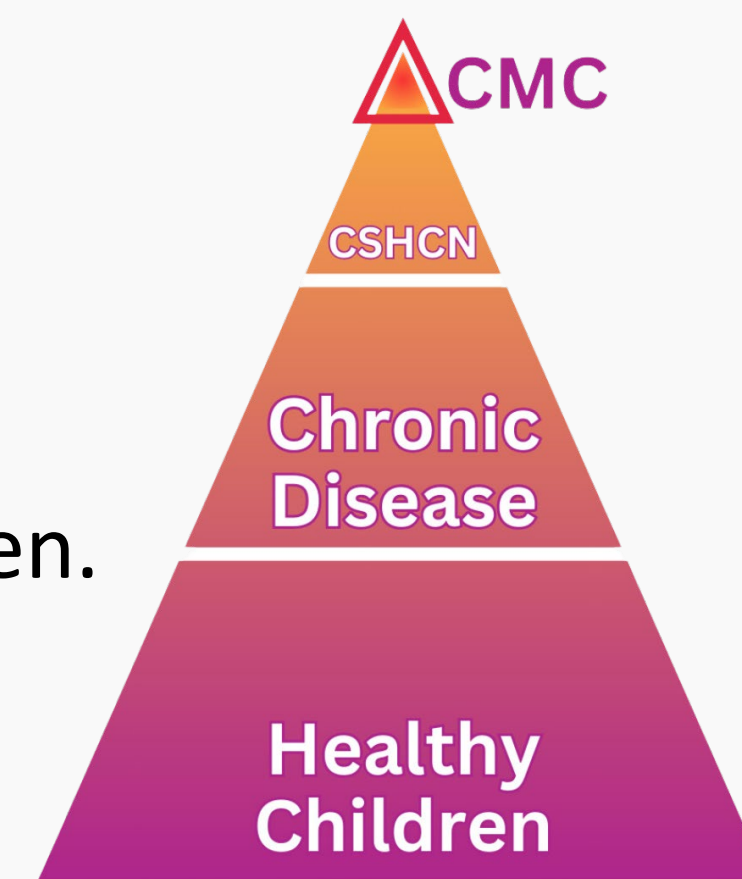
- Inadequate weight gain.
- Suboptimal growth.
- Developmental delays.

Prevalence:

- 10% of outpatient pediatrics children.
- 5% of hospitalized children [2,7].

CMC represent:

- 10% of Children with Special Health Care Needs (CSHCN)
 - This 10% account for 70% of pediatric healthcare expenditures.
- 6% of Medicaid-insured pediatric patients but account for:
 - 40% of pediatric healthcare costs.
 - 41% of hospital days [1].



CHALLENGES IN MANAGING FTT

Effective FTT management among CMC requires strategies beyond traditional primary care models requiring:

- Frequent follow-up.
- Enhanced caregiver knowledge [7].

Without intervention, FTT can lead to:

- Delayed developmental milestones.
- Impaired immune function.
- Increased susceptibility to infections [4].

AIM

NEED FOR INNOVATION:

The **Complex Care Team at Children's of Mississippi** manages:

- 1,400+ CMC
- 250 patients actively followed for FTT

The study aims to:

- Provide early intervention and effective care strategies.
- Break down barriers to management.
- Allow real-time tracking of weight and feeding patterns.
- Intervene quickly.
- Enhance continuity of care and caregiver support.

ACKNOWLEDGEMENT

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METHODS

IRB APPROVAL – September 16, 2023.

DESIGN – Quasi-experimental with a quantitative focus

PARTICIPANTS

Inclusion Criteria:

- Children aged 1–10 years
- Diagnosis of FTT with feeding tube support
- Access to internet-enabled devices



INTERVENTIONS

- **Remote Patient Monitoring (RPM)** – Weekly submission of weight and feeding data
 - **Caregiver Education** – Weekly virtual sessions to reinforce nutritional guidance, and address feeding challenges
 - **Follow-ups** – Multidisciplinary team addressed any barriers to compliance (i.e. socioeconomic, technical, etc.)
- BASELINE ASSESSMENTS**
- Collected demographic data, medical history, and baseline health metrics (e.g., weight, feeding behaviors).
 - Caregivers received training on the use of RPM devices.

OUTCOME MEASURES

- **Primary Outcome**
 - Changes in weight trends over the six-month period
- **Secondary Outcomes**
 - Hospitalizations during the 6 months prior to, during, and after the intervention

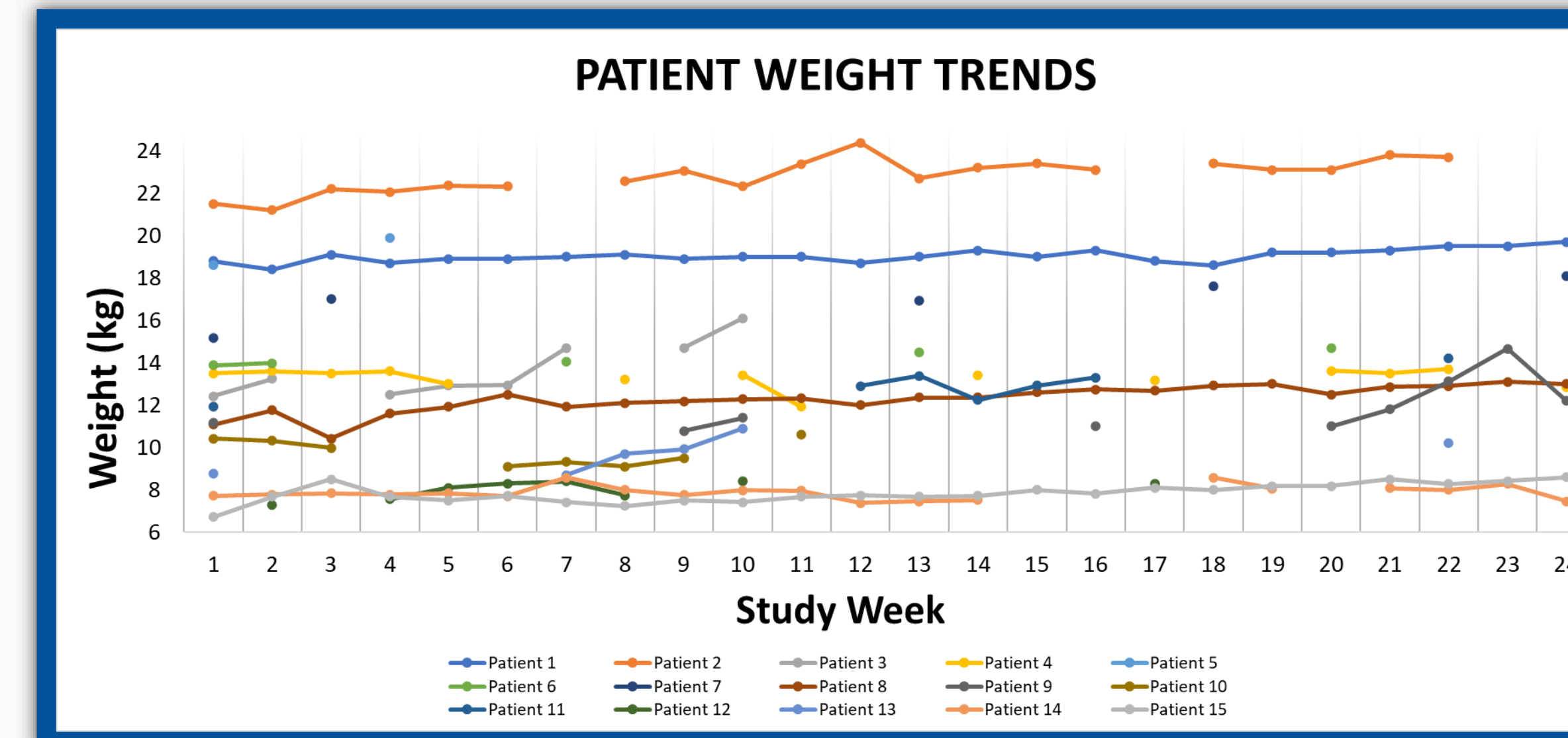
DATA ANALYSIS

- Weekly weight data and hospitalization records were analyzed for trends and outcomes.
- Missing data points due to caregiver noncompliance were noted and addressed.
- **Results were compared across three time periods:**
 - PRE-intervention (6 months)
 - DURING intervention (6 months)
 - POST-intervention (6 months)



The Bluetooth-enabled scale connects to mobile applications such as CareConsole Mobile and MyCare Virtual, enabling caregivers to track and submit body weight. Caregivers had the option to BYOD (Bring Your Own Device) if they had a reliable smartphone and cellular service. For those without these resources, a tablet with cellular access was provided to ensure participation.

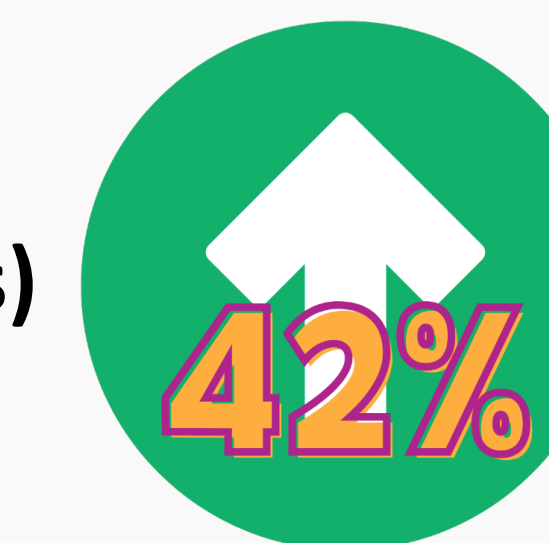
OUTCOME



The table presents individual weight trends for 15 patients over the course of the study, illustrating variations in growth trajectories.

RESULTS

- **Total Data Points:** 184 weight measurements
- **Missing Data:** 45.4% of the weight entries (153 data points)
- **Weight Data:**
 - Range: 6.71 kg – 24.37 kg
 - Mean of 13.23 kg
 - Median of 12.50 kg
 - Standard Deviation of 5.01 kg
- **Participant Data:**
 - Weight Increased – 42% (6 participants)
 - Weight Maintained – 50% (8 participants)
 - Weight Declined – 8% (1 participant)



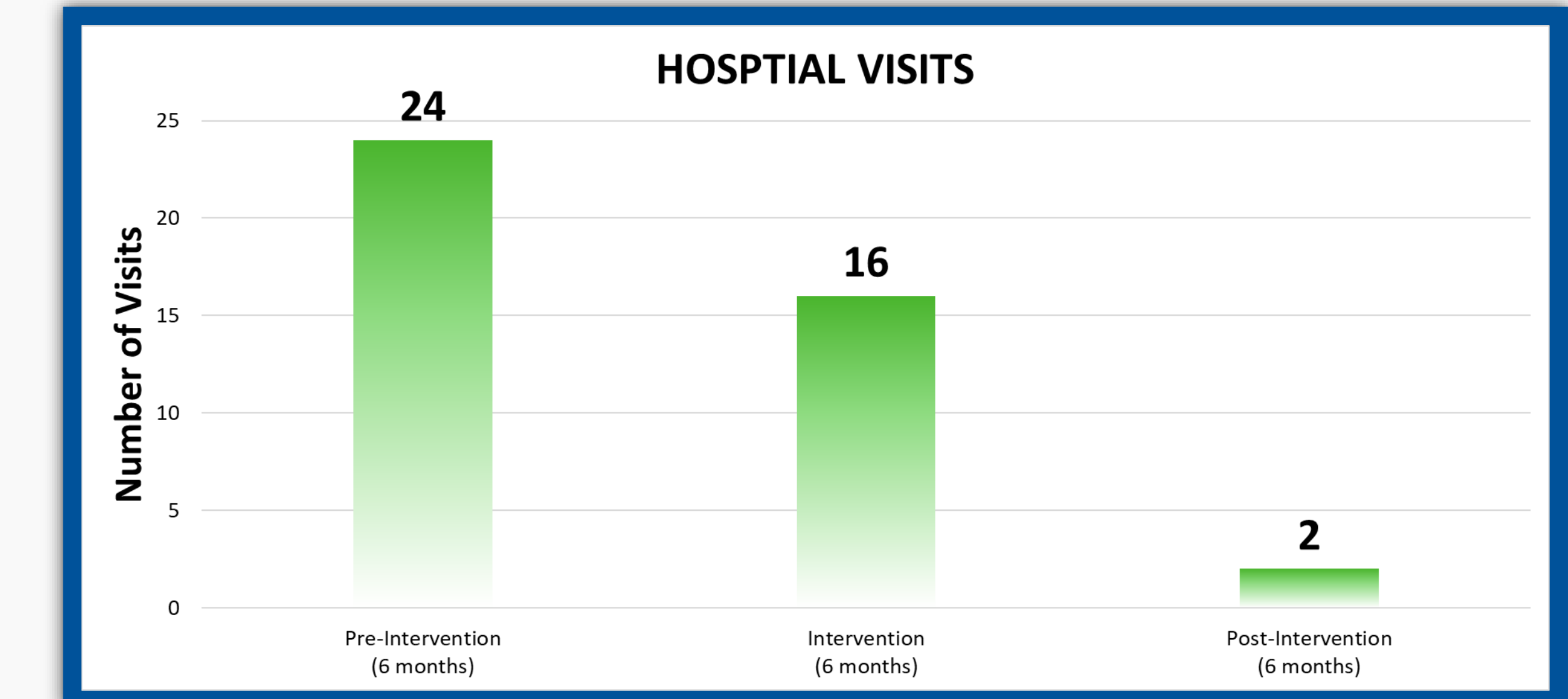
KEY IMPLICATIONS:

- **Proactive Care Model:** Early intervention to reduce hospital-based acute care
- **Caregiver Empowerment:** Caregiver tools and knowledge to manage their child's condition at home to minimize emergency interventions
- **Cost Efficiency:** Reduction in hospitalizations decreased healthcare costs

HOSPITALIZATIONS ACROSS TIME PERIODS

The RPM program demonstrated a significant reduction (92% reduction compared to pre-study period) in hospitalizations for pediatric patients with Failure to Thrive (FTT). These reductions are as follows:

- Hospital Visits for 6 months **PRIOR** to the Study – 24
- Hospital Visits for 6 months **DURING** the Study – 16
- Hospital Visits for 6 months **FOLLOWING** the Study – 2



The chart illustrates the reduction in hospital visits across three time periods: pre-intervention, during the intervention, and post-intervention.

CHALLENGES & NEXT STEPS

EDUCATION MOMENT

Establishing a medical home for your medically complex child with a feeding tube is a crucial step in ensuring comprehensive and coordinated healthcare. A medical home serves as a central hub where your child's healthcare needs are met through a team of dedicated professionals. Having a medical home means that your child will have a primary care provider who knows their medical history, unique needs, and ongoing treatments. This continuity of care allows for better communication, personalized treatment plans, and streamlined access to necessary specialists and services. It also fosters a strong partnership between you, your child, and the healthcare team, ensuring that all decisions are made collaboratively.

Example of educational moments during weekly RPM check-ins, including tailored guidance on nutrition, feeding techniques, caregiver stress management, and the importance of a medical home for medically complex children.

LIMITATIONS

- **Caregiver Noncompliance:** Low adherence to weekly weigh-ins and educational sessions. Education was offered during 100% of visits, but completion occurred in only 18.8% of visits.
- **Technological Barriers:** Limited access to reliable internet or familiarity with Bluetooth-enabled RPM
- **Small Sample Size:** The limited cohort of 15 participants restricts generalizability of findings
- **Data Gaps:** Missing weight data due to inconsistent caregiver participation in data submission

FUTURE DIRECTIONS:

- Address adherence challenges
- Expand the cohort
- Implement at the time of hospital discharge for newly diagnosed FTT patients

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