

Assessing Physical Health and Activity Barriers in Children with Cystic Fibrosis

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Introduction

Cystic Fibrosis (CF) greatly affects body composition and physical activity levels, key factors influencing health outcomes. Understanding of **the impact of CFTR modulators** and **barriers to physical activity** in CF is limited.

Aims

Handgrip strength (HGS), skeletal muscle mass (SMM) and **factors influencing physical activity** were assessed in children with CF.

Methods

From **February to November 2023**, we measured HGS (Jamar Hand Grip Dynamometer) and SMM (InBody 770) in children with CF (aged **6-20 years**) in a **single-centre cross-sectional analysis**. Parents completed a **physical activity questionnaire**, while children aged ≥ 14 completed their own. Data were analyzed based on CFTR modulator therapy: **non-modulator (NM)**, **12 months elexacaftor/tezacaftor/ivacaftor (ETI)**, and **24 months of lumacaftor/ivacaftor (LUMA/IVA)** using **descriptive statistics**.

Results

We enrolled 53 children with CF (26 boys) in three groups (NM=22, ETI=4, LUMA/IVA=27). **The mean age** was lowest in the non-modulator group (NM: 11.4 ± 3.8 years; ETI: 15.6 ± 3.6 years; LUMA/IVA: 13.1 ± 4.6 years). **HGS and SMM** showed similar trends: HGS: 19.6 ± 9.7 kg, SMM: 17.5 ± 7.7 kg in the NM group, HGS: 22.4 ± 7.2 kg, SMM: 21.9 ± 6.4 kg in the ETI group and HGS: 24.7 ± 13.5 kg, SMM: 20.0 ± 8.9 kg for LUMA/IVA group. **Parent-reported barriers to physical activity** were mainly external (N=13, 68.4%), citing lack of time, fatigue, and other commitments. Psychological barriers were reported by three children, with external reasons predominant (N=13). **Weekly exercise time** averaged 13.7 ± 7.3 h (children-reported) and 11.5 ± 6.1 h (parent-reported), exceeding recommendations.

Conclusions

HGS and SMM are valuable tools for assessing physical health in children with CF, shedding light on the effects of modulator therapy. **Addressing barriers to physical activity is essential for improving overall health outcomes in this population.**

Variables	Non-modulator (n=22)	ETI (n=4)	LUMA/IVA (n=27)
Boys/girls	8/14	1/3	17/10
Age (mean \pm SD; years)	11.4 \pm 3.8	15.6 \pm 3.6	13.1 \pm 4.6
Pancreas exocrine insuff/suff.)	22/0	4/0	27/0

Table 1. Main characteristics of participations based on modulator status

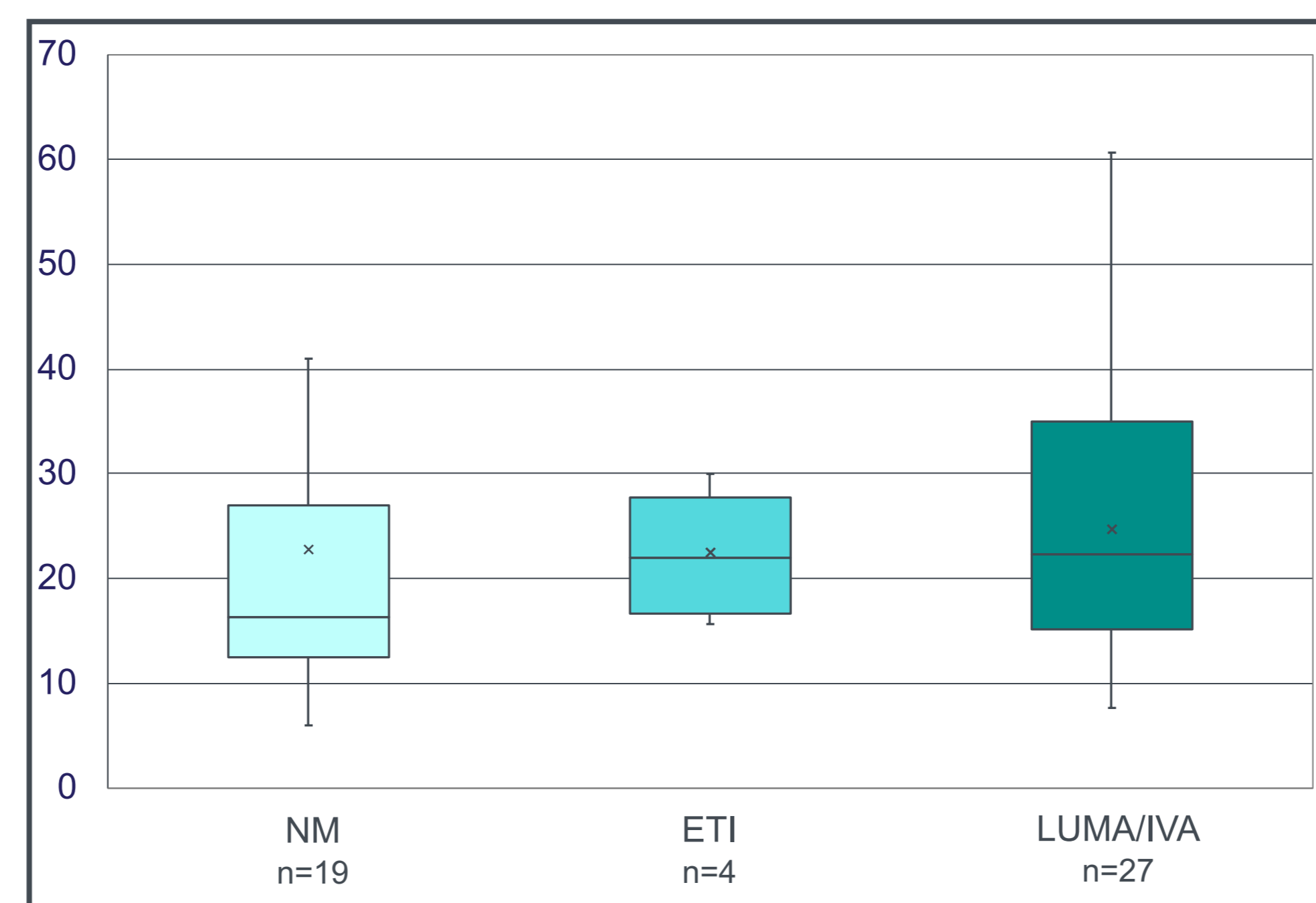


Figure 1. Hand grip strength (kg)

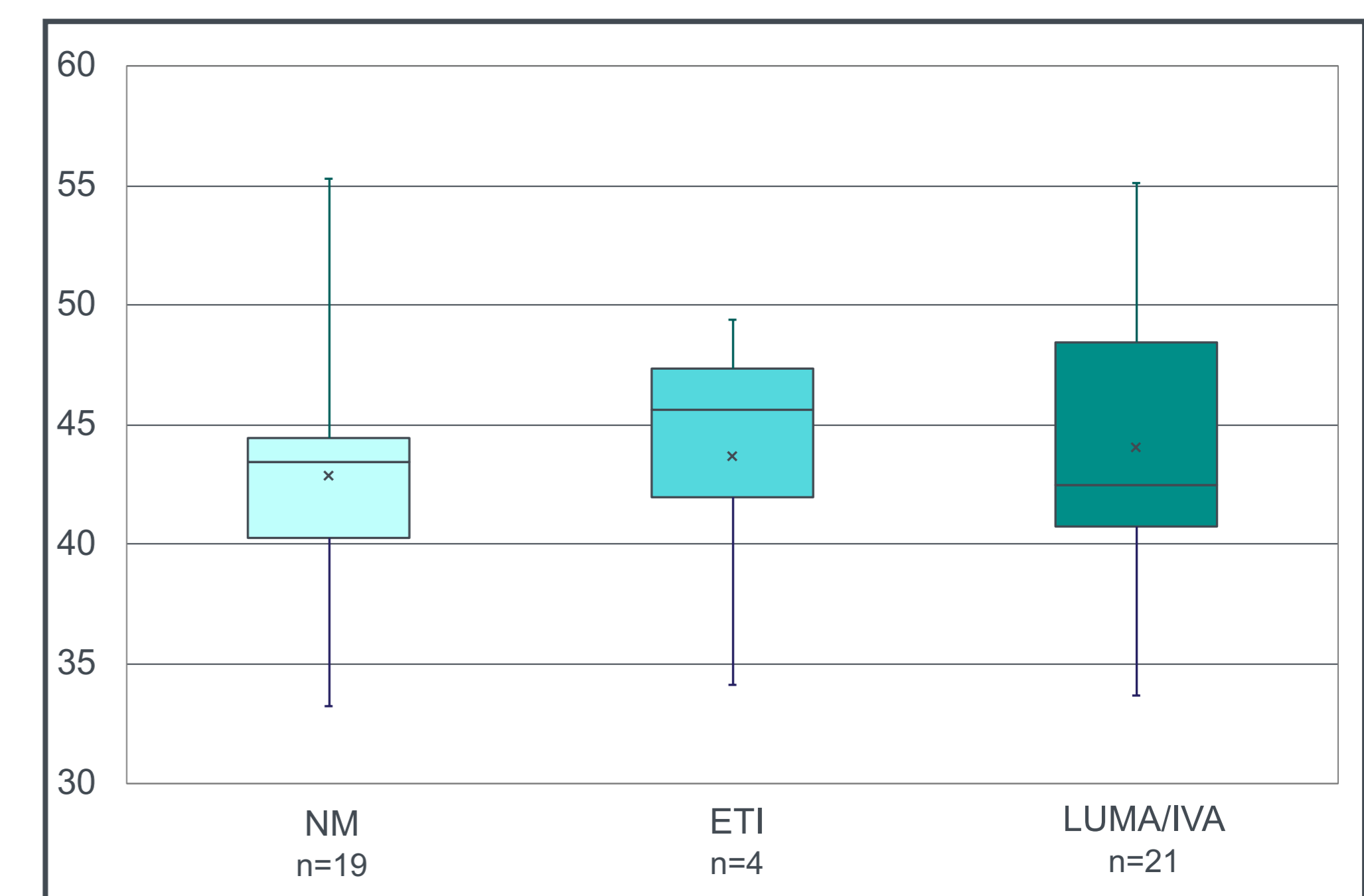


Figure 2. Skeletal muscle mass (%)

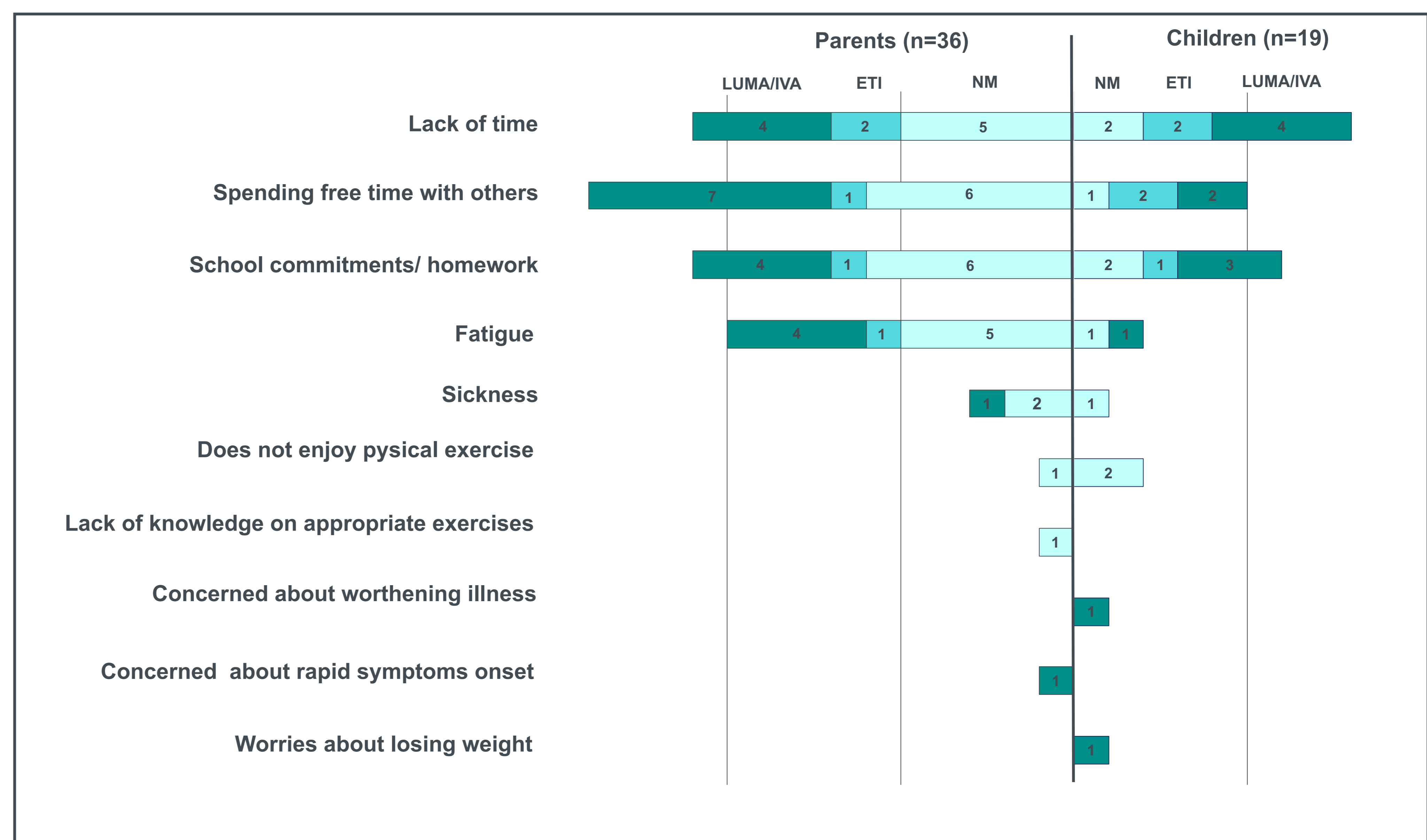


Figure 3. Barriers of physical activity reported by parents and children

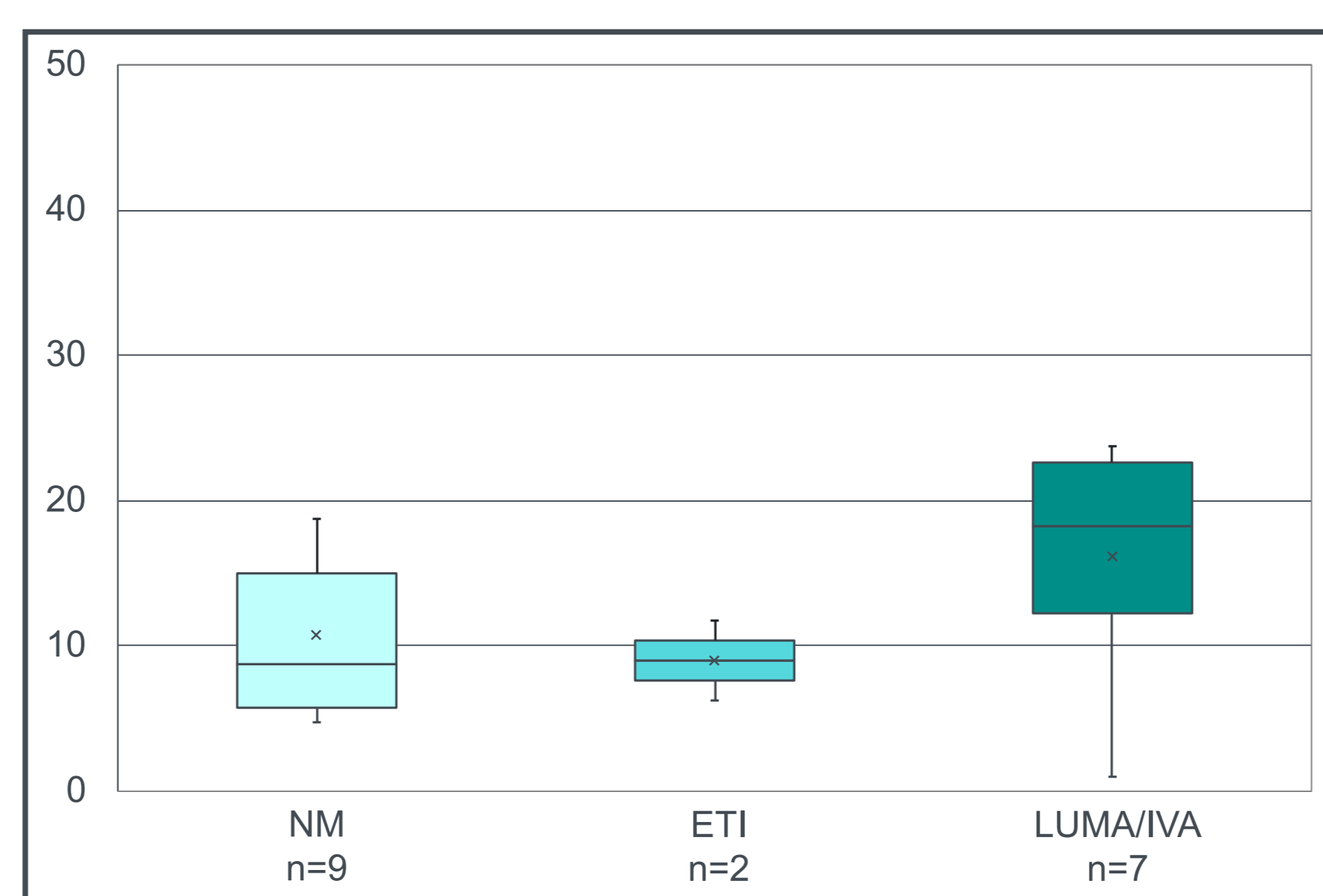


Figure 4. Weekly exercise time reported by children (hours)

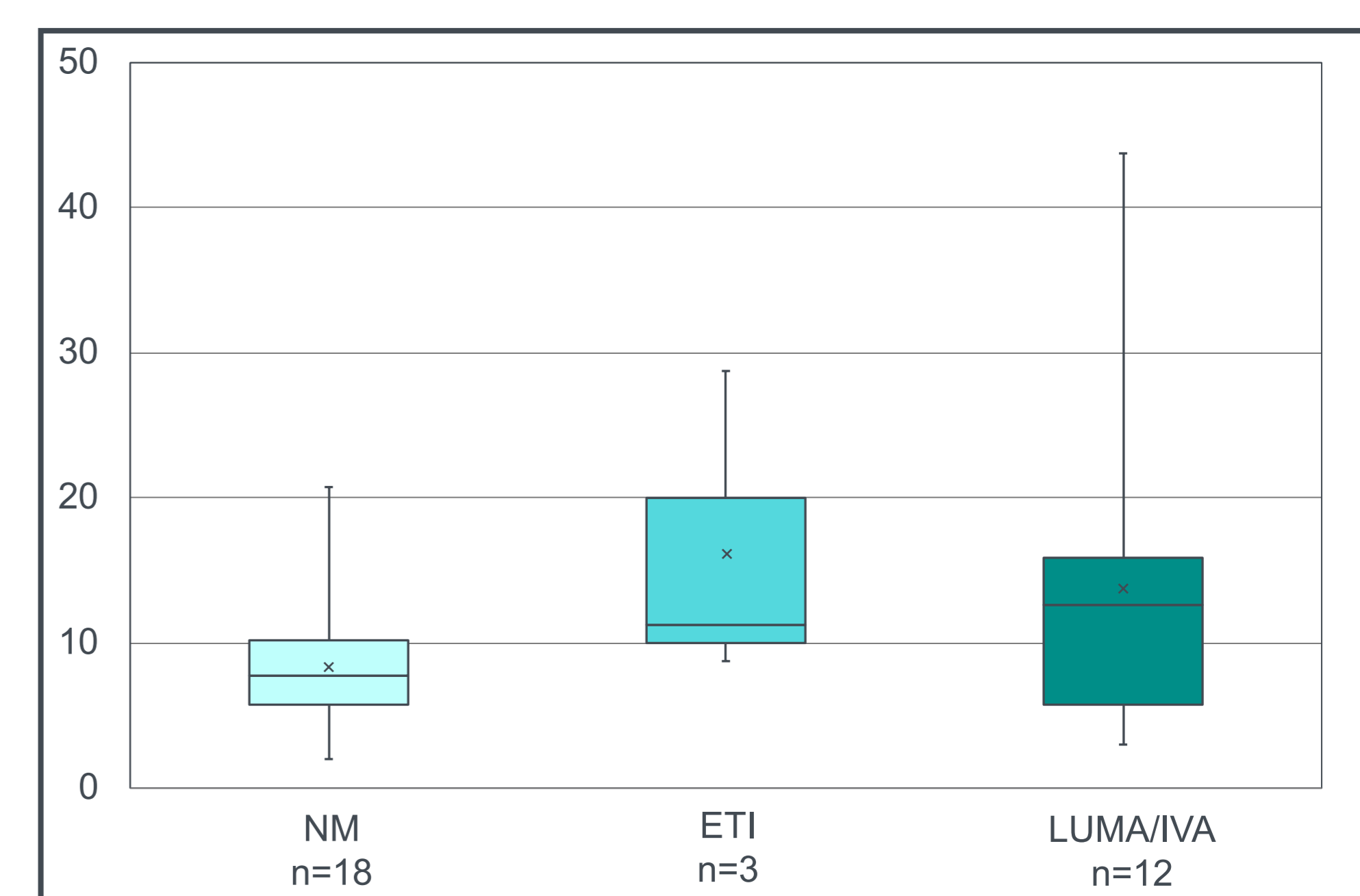


Figure 5. Weekly exercise time reported by parents (hours)