

Effect of a 6-Week Multimodal Program Versus Occlusal Splint on Pain, Mouth Opening and Quality of Life in Adults with Temporomandibular Disorder (TMD): A Controlled Clinical Trial

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Introduction

Temporomandibular disorders (TMD) affect the temporomandibular joint, masticatory muscles, and associated structures. They are the most common cause of non-odontogenic orofacial pain and the second most prevalent musculoskeletal condition.

5-12% of the adult population, with higher prevalence in **females aged between 20 and 50 years.**

Common symptoms include pain, limited mouth opening, and joint sounds, affecting oral function and quality of life. The aetiology of TMD is multifactorial, involving triggering, predisposing, and perpetuating factors. Management should be multidisciplinary, with conservative treatments such as physiotherapy and occlusal splints playing a central role. **However, comparative evidence on their clinical effectiveness remains limited, highlighting the need for further research in this area.**

Aim

To evaluate and compare the effects of a multimodal programme (manual therapy combined with therapeutic exercises) versus an occlusal splint on pain modulation, mouth opening, and oral health-related quality of life (OHRQoL) in the treatment of adults with muscular TMD and restricted mouth opening over a six-week period.

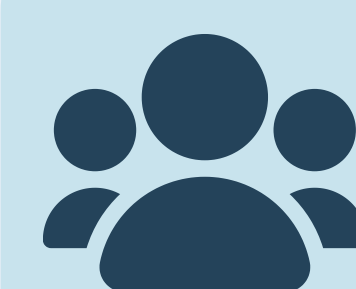
Materials and Methods

A controlled clinical trial was conducted over a **6-week period**, including **24 participants aged between 18 and 50 years**, diagnosed with **muscular TMD with restricted mouth opening** and allocated into two experimental groups.



SCAN HERE
for the study design and eligibility criteria

Group 1



Submitted to a weekly multimodal physiotherapy programme consisting of a 30-minute session, including manual therapy techniques and therapeutic exercises.

Group 2



Instructed to use a 3mm thermoplastic occlusal splint every night.

Assessments were conducted at two time points:

- Pre-intervention (**T0**)
- 48 hours after the end of the intervention (**T1**)

Outcome Measures and Instruments:

- **Pain intensity** – Numerical Pain Rating Scale (NPRS)
- **Pressure pain threshold (PPT)** – analogue algometer
- **Mouth opening range** comfortable (MCO) and maximum forced (MFO) – digital calliper
- **OHRQoL** – Portuguese version of the *Oral Health Impact Profile* (OHIP-14)

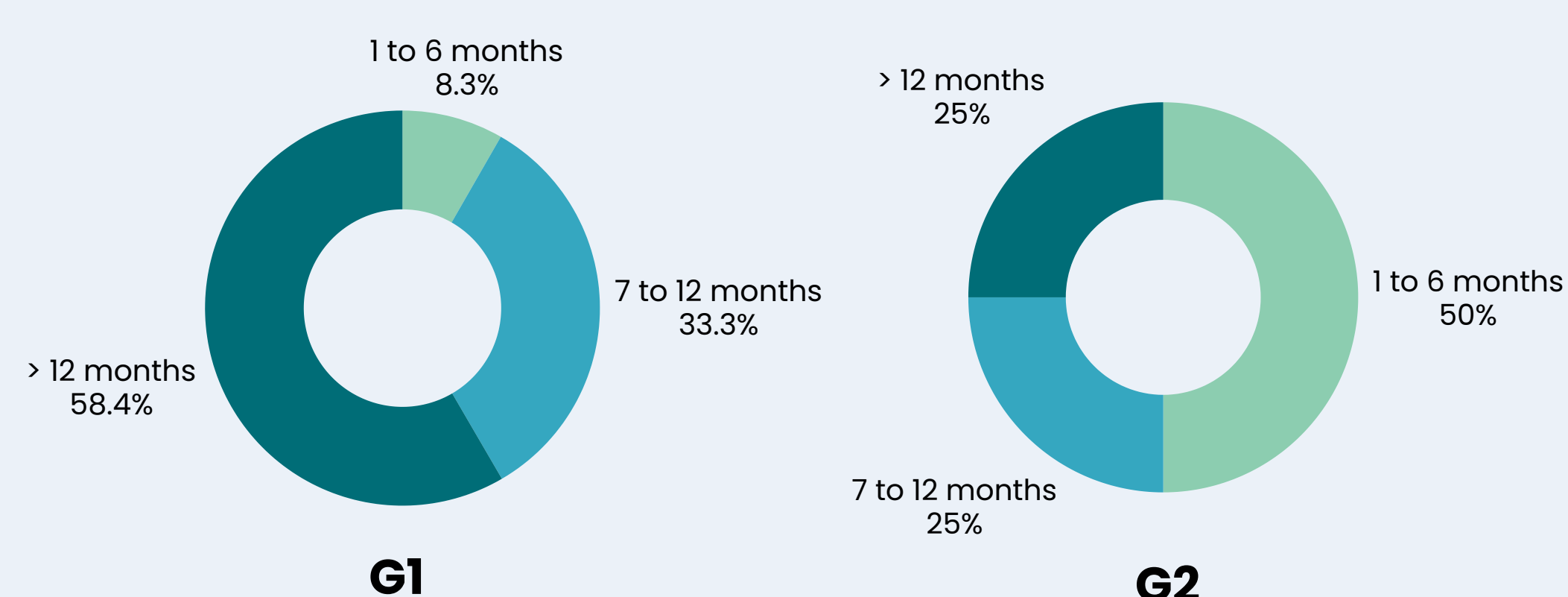


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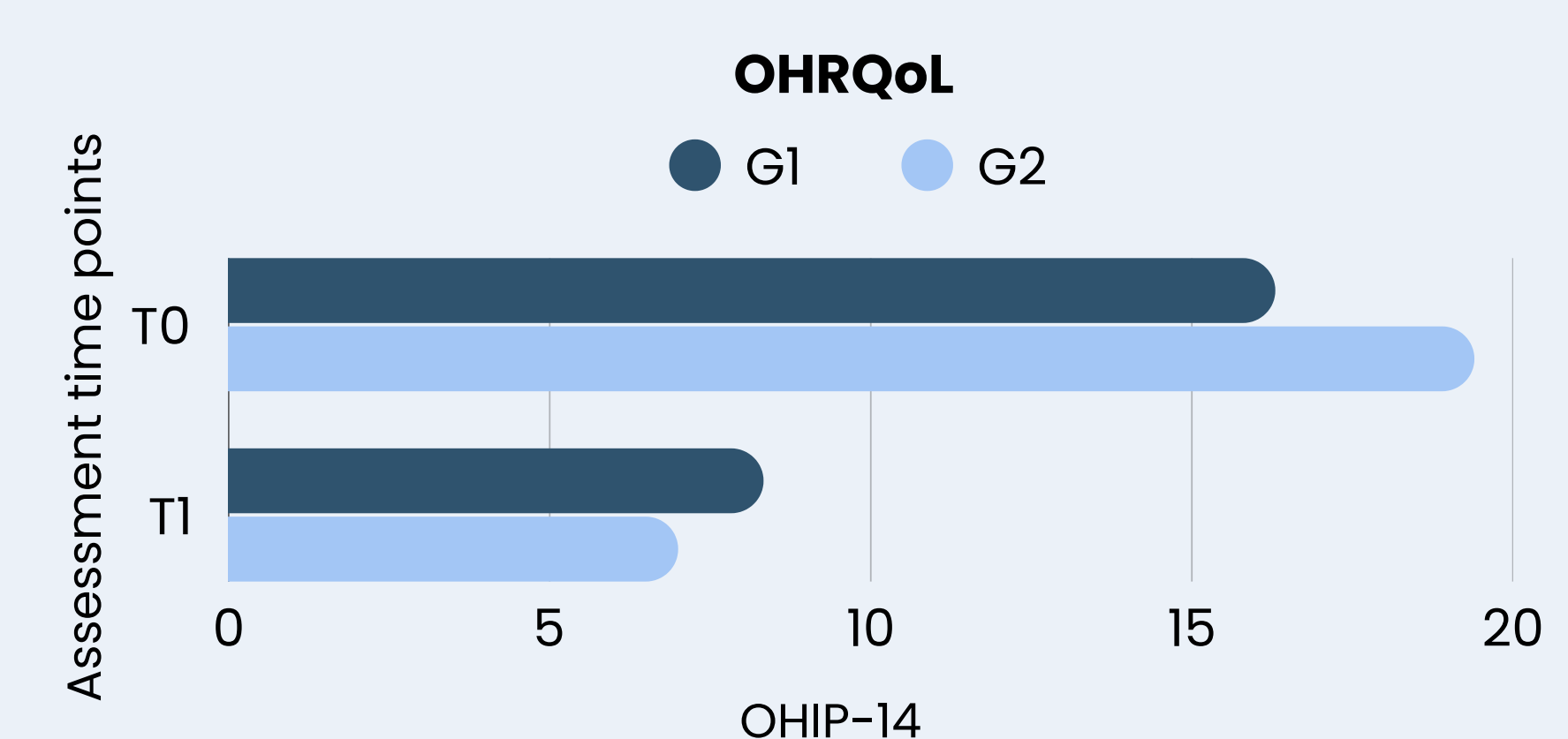
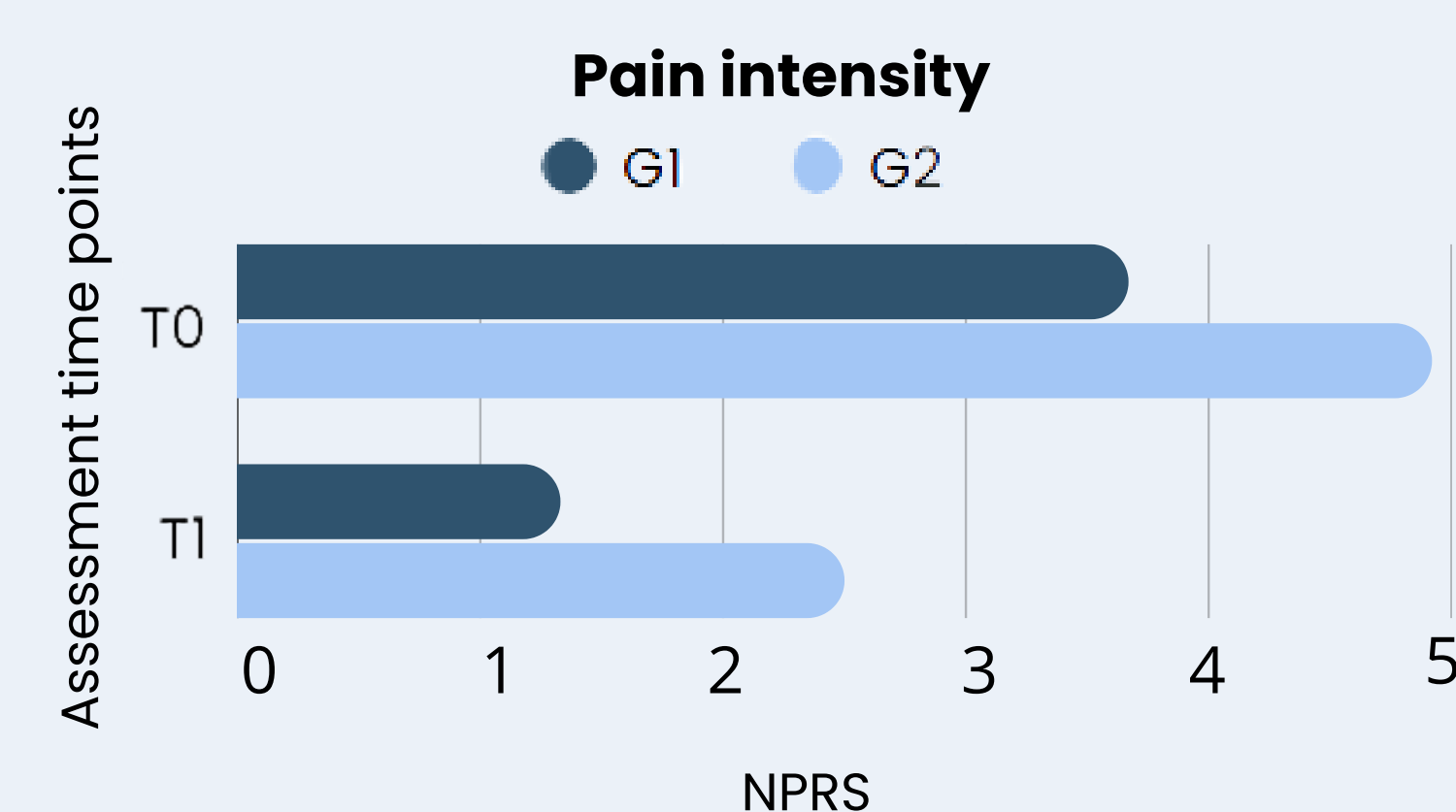
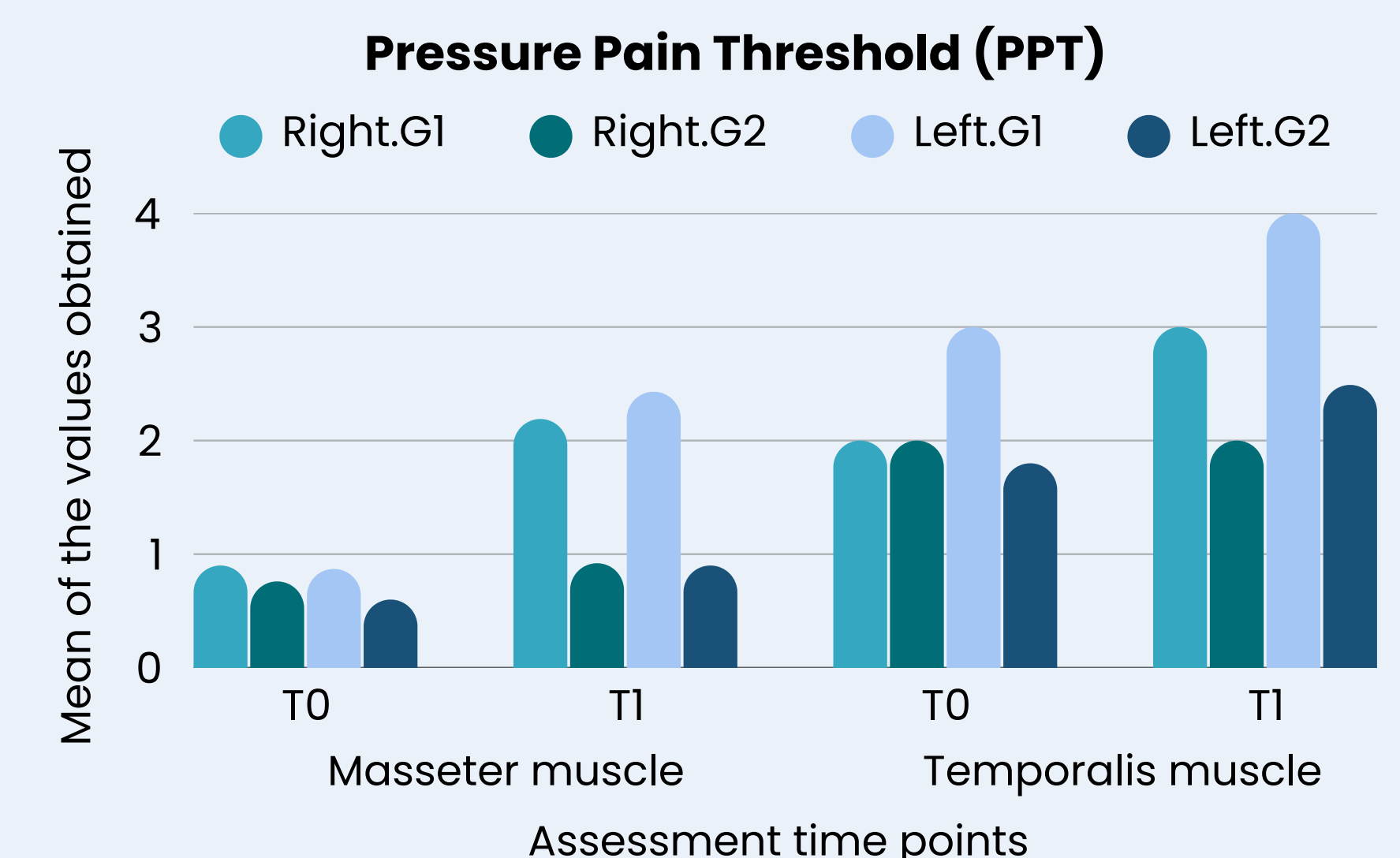
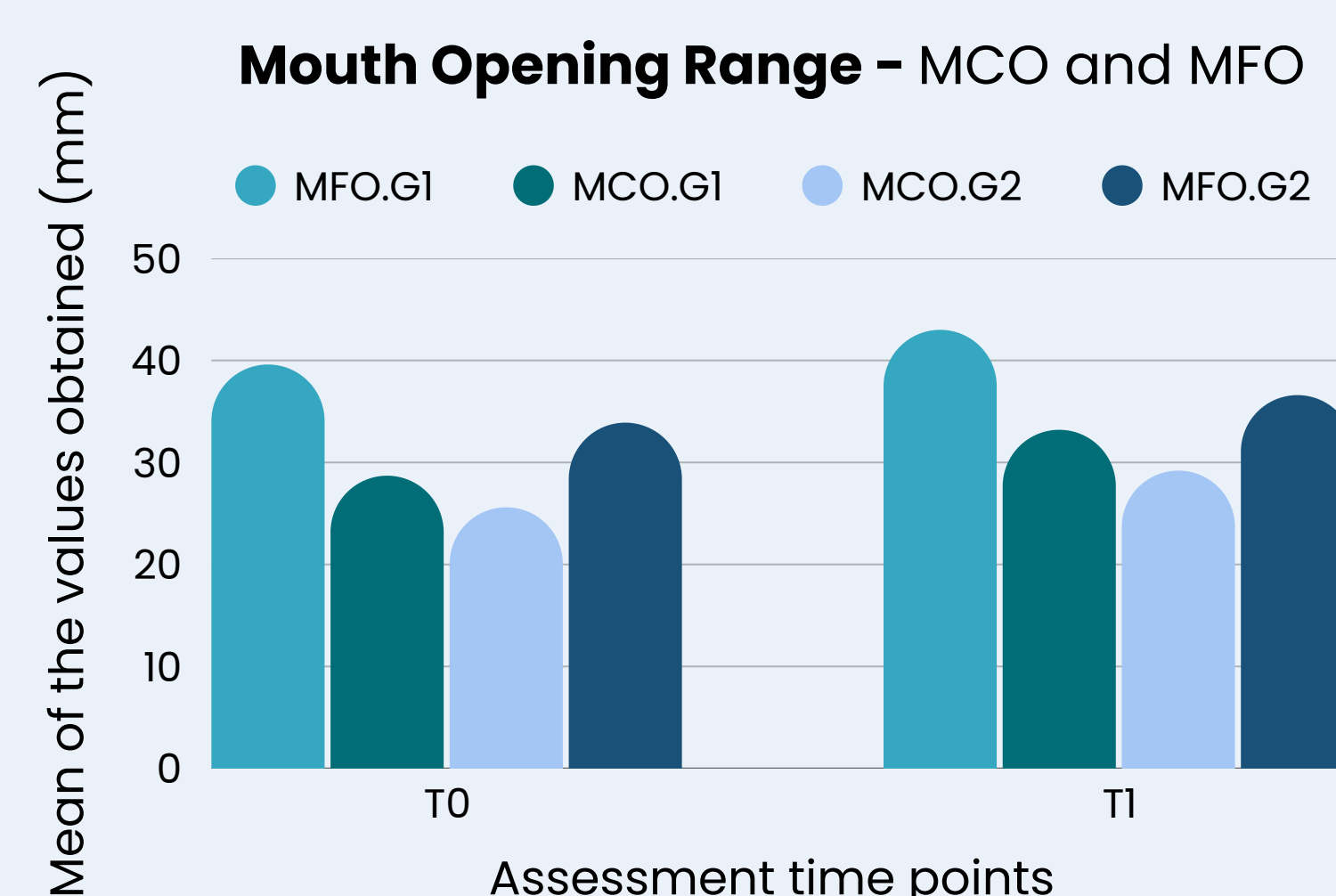
Results & Discussion

- Results showed a higher **prevalence of TMD in females**, with female-to-male ratios of 3:1 in G1 and 5:1 in G2. Participants were aged between 18 and 50 years, an age range considered high-risk according to the literature.
- **Myofascial pain was the most common disorder** in both groups. G1 included more cases of **chronic pain**, whereas G2 had more recent pain, suggesting distinct clinical profiles that may influence treatment response.

Duration of mandibular pain (%)



- After six weeks, **both groups showed significant improvements in pain, mouth opening, and quality of life.** The occlusal splint was more effective in reducing pain ($p < 0.001$), while the multimodal physiotherapy programme demonstrated greater improvement in mouth opening and pressure pain threshold ($p < 0.05$).



- **The only statistically significant difference between groups was observed in PPT, in favour of physiotherapy.**

- The differences between the interventions suggest distinct mechanisms of action. **The occlusal splint appears to act more directly on symptomatic pain relief, while physiotherapy may activate descending inhibitory pathways** through manual therapy and exercises, promoting neurotransmitter release, pain modulation, functional improvement, and enhanced quality of life.

Conclusion

Both approaches proved effective in treating muscular TMD, offering distinct yet complementary benefits. Intervention should be tailored to individual needs, highlighting the value of a personalised, multidisciplinary approach. However, the small sample size and short follow-up may limit the generalisability of the results.

References

- Armijo-Olivo S, et al. Phys Ther. 2016;96(1):9–25.
- de Leeuw R, Klasser GD, eds. Orofacial Pain. 6th ed. Quintessence; 2018.
- Gil-Martínez A, et al. J Pain Res. 2018;11:571–87.
- Incorvati C, et al. BMJ Open. 2020;10(8):e038438.
- Schiffman E, et al. J Oral Facial Pain Headache. 2014;28(1):6–27.