



An evaluation of orthodontic treatment of Class III malocclusions using the Peer Assessment Rating (PAR) at the University of Health Sciences, Phnom Penh

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The background

The University of Health Sciences, Phnom Penh, established its first Orthodontic Postgraduate Program in 2004. This study is undertaken to "bench mark" the quality of the treatment its students provide.

Aim

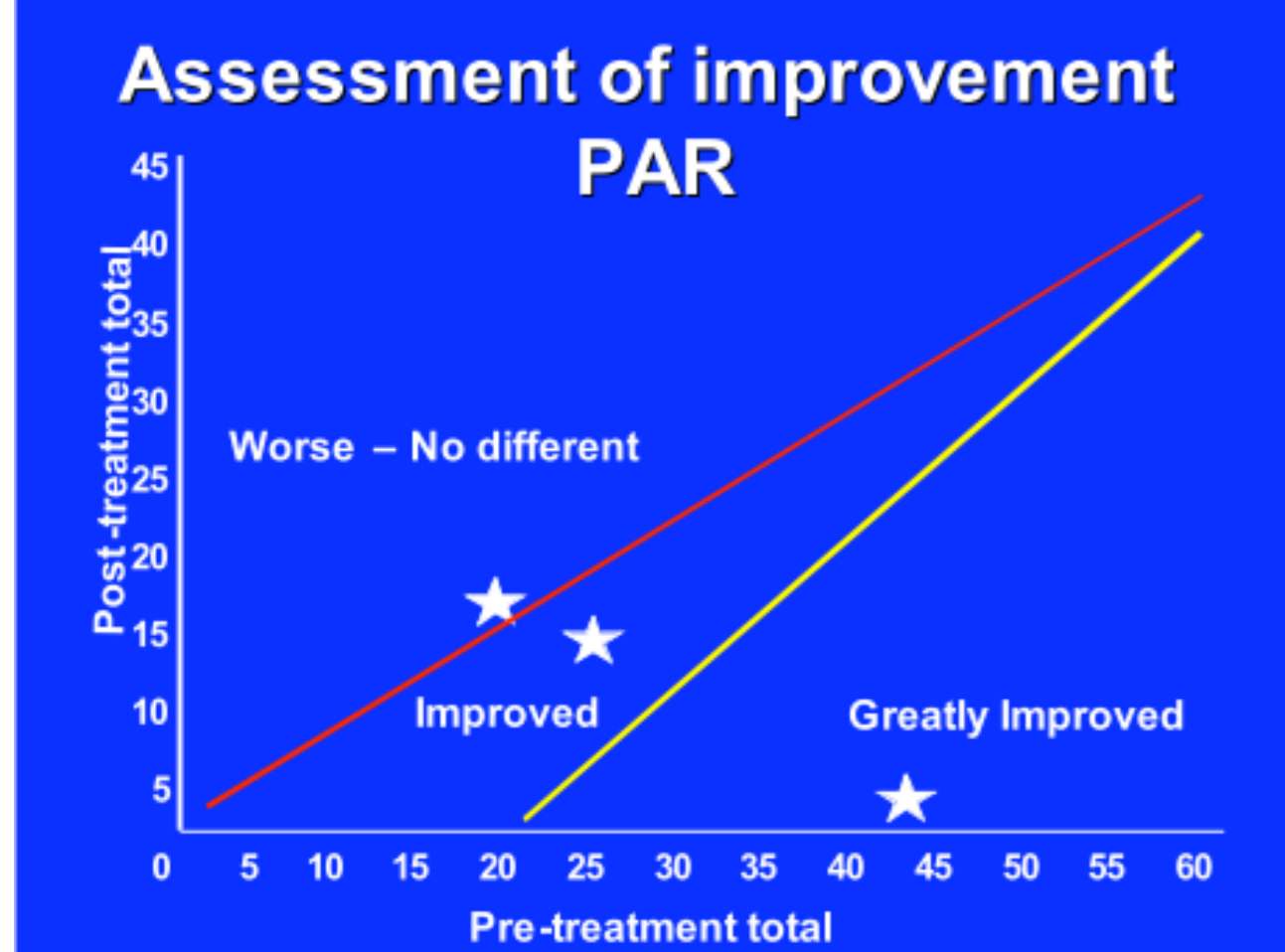
This retrospective study was done to establish the standard of treatment for Class III malocclusion patients treated at the Orthodontic Department Clinic from 2004-2010 using the Peer Assessment Rating Index (PAR) Index.

Method

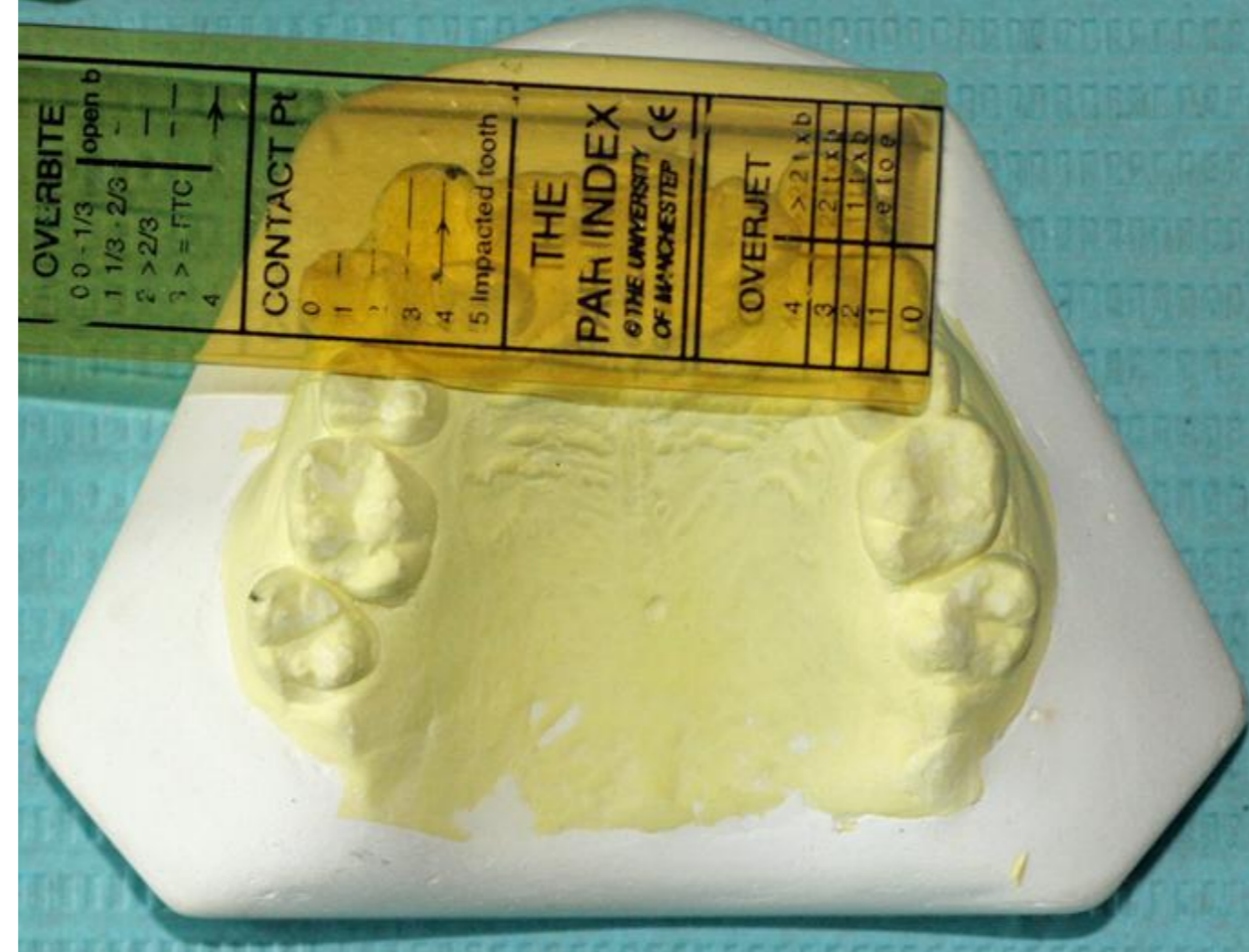
46 (11 males, 35 females) patients fulfilled the study requirements. Each had a Class III malocclusion, as defined by the British Standard Institute, had pre- and post-treatment study models, had completed a course of orthodontic treatment provided by one of the four postgraduate students on the course. The orthodontic treatment needs were evaluated by measuring the selected pre-treatment study casts using the Aesthetic Component (AC) and Dental Health Component (DHC) of IOTN Index. PAR & IOTN scoring were undertaken by a single individual who had undergone calibration. In addition a separate reproducibility study was undertaken to further validate the study. The 3 elements of the PAR index used in assessing treatment outcome are:

- i) Reduction in Weighted Par Score (Pre-treatment PAR - Post treatment PAR)
- ii) Percentage change in weighted PAR score (PAR reduction ÷ Pre treatment PAR x 100)
- iii) Nomogram

Worse no different, Improved or Greatly improved categories



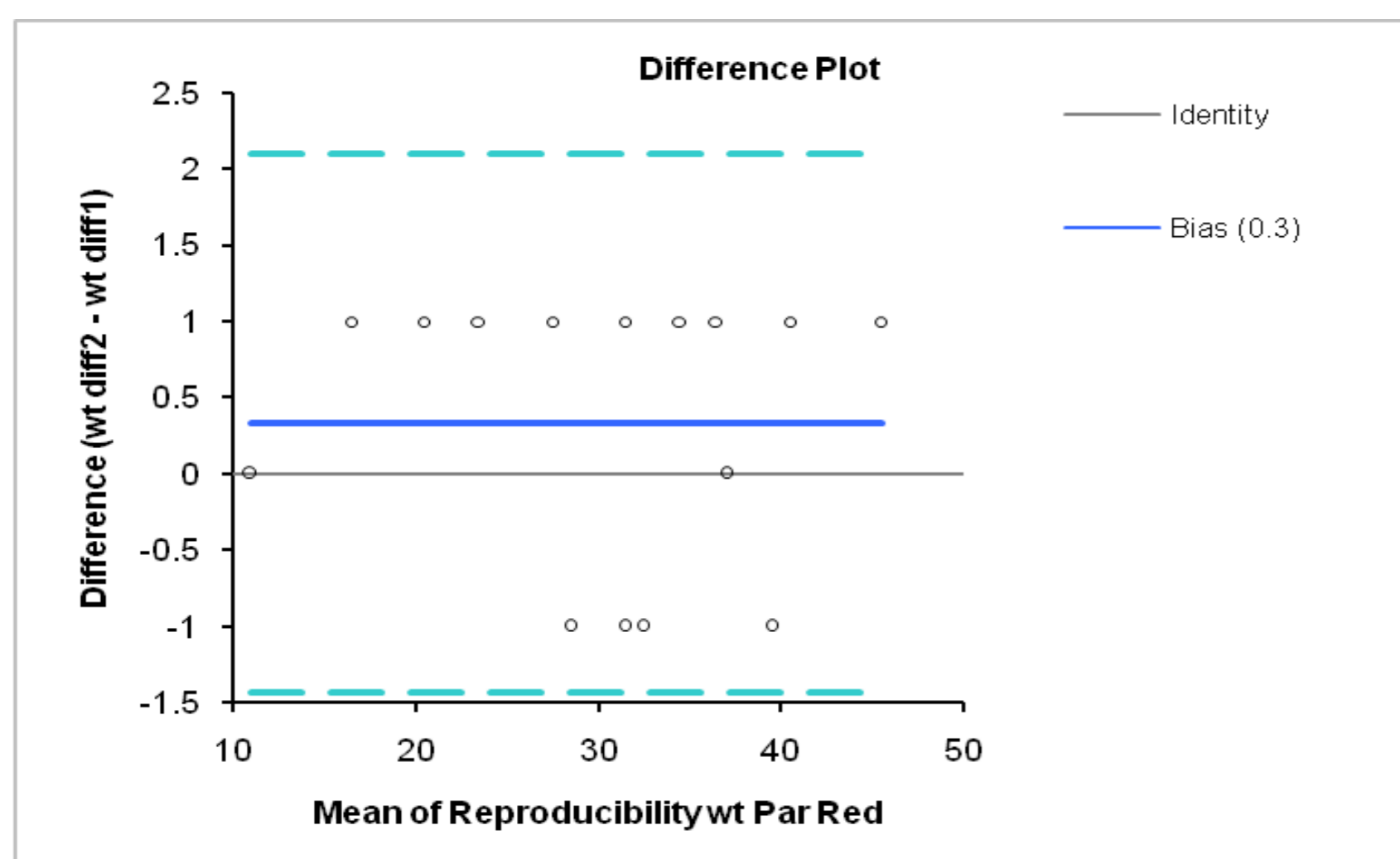
Nomogram



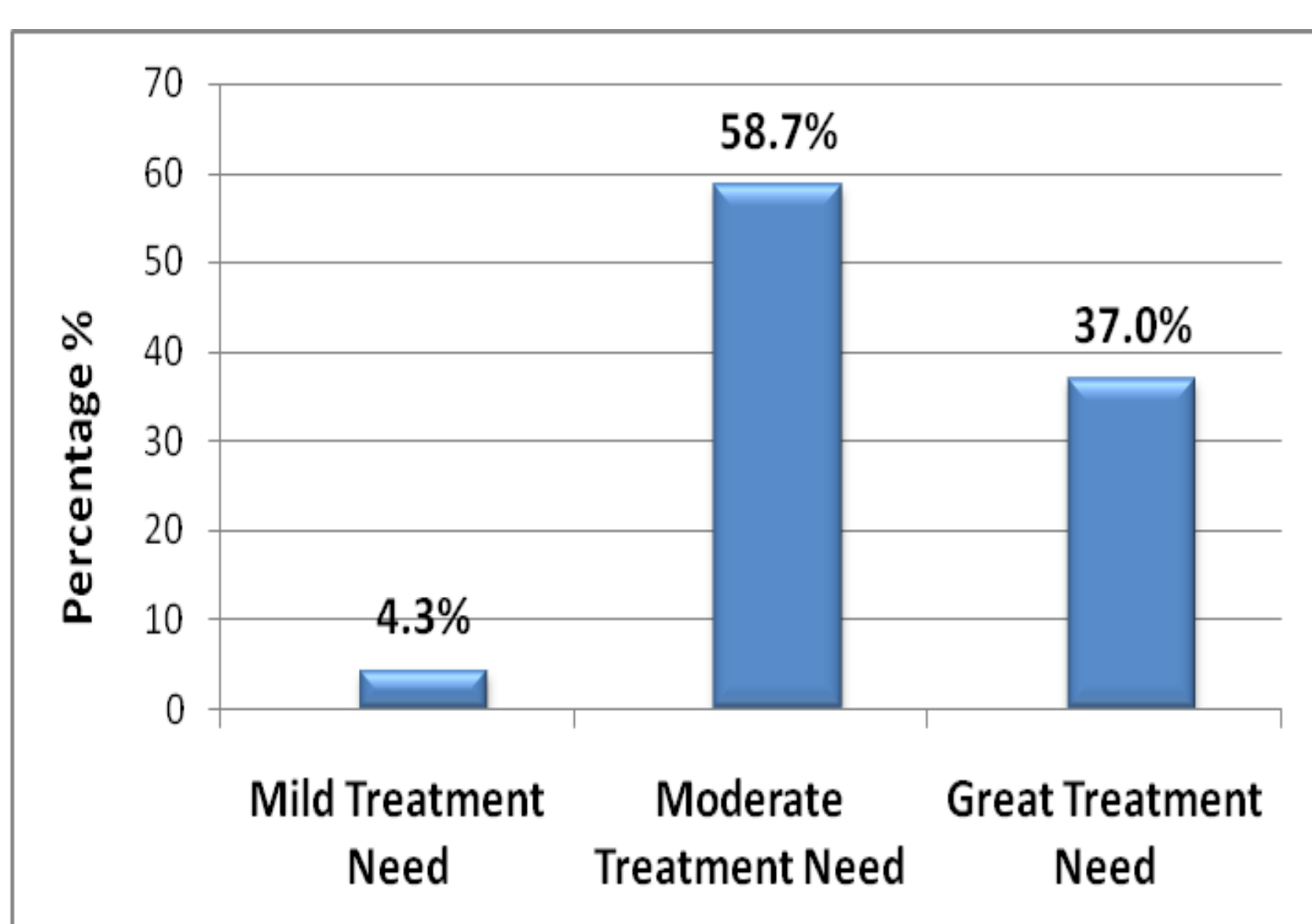
All the components of the PAR Index were recorded using a single PAR ruler

Results

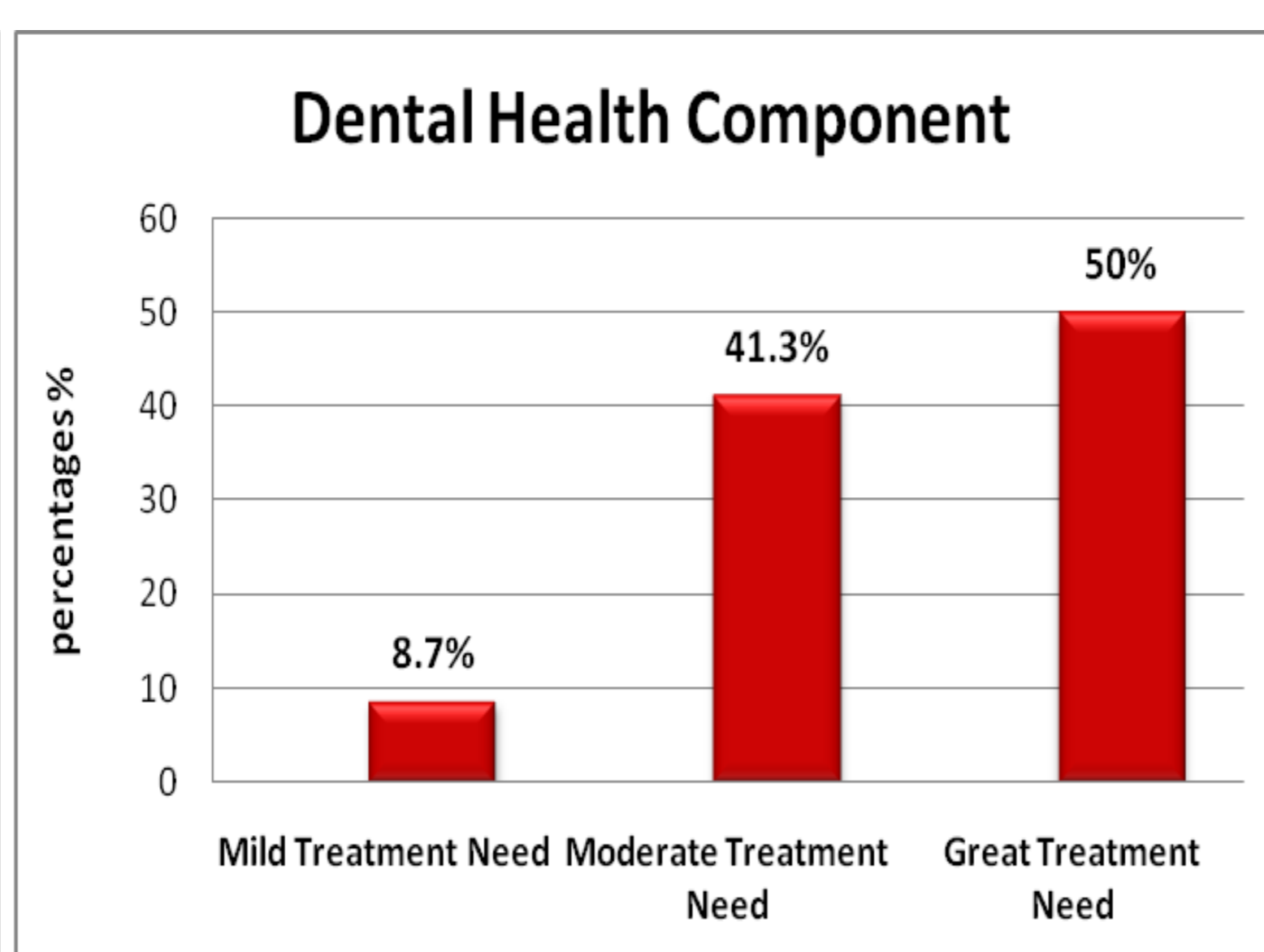
The reproducibility analysis carried out by Pearson Correlation, Paired "T" Test and Bland Altman Test showed good reproducibility.



Bland Altman Test Weighted Total Par score reductions at week 1 and week 3

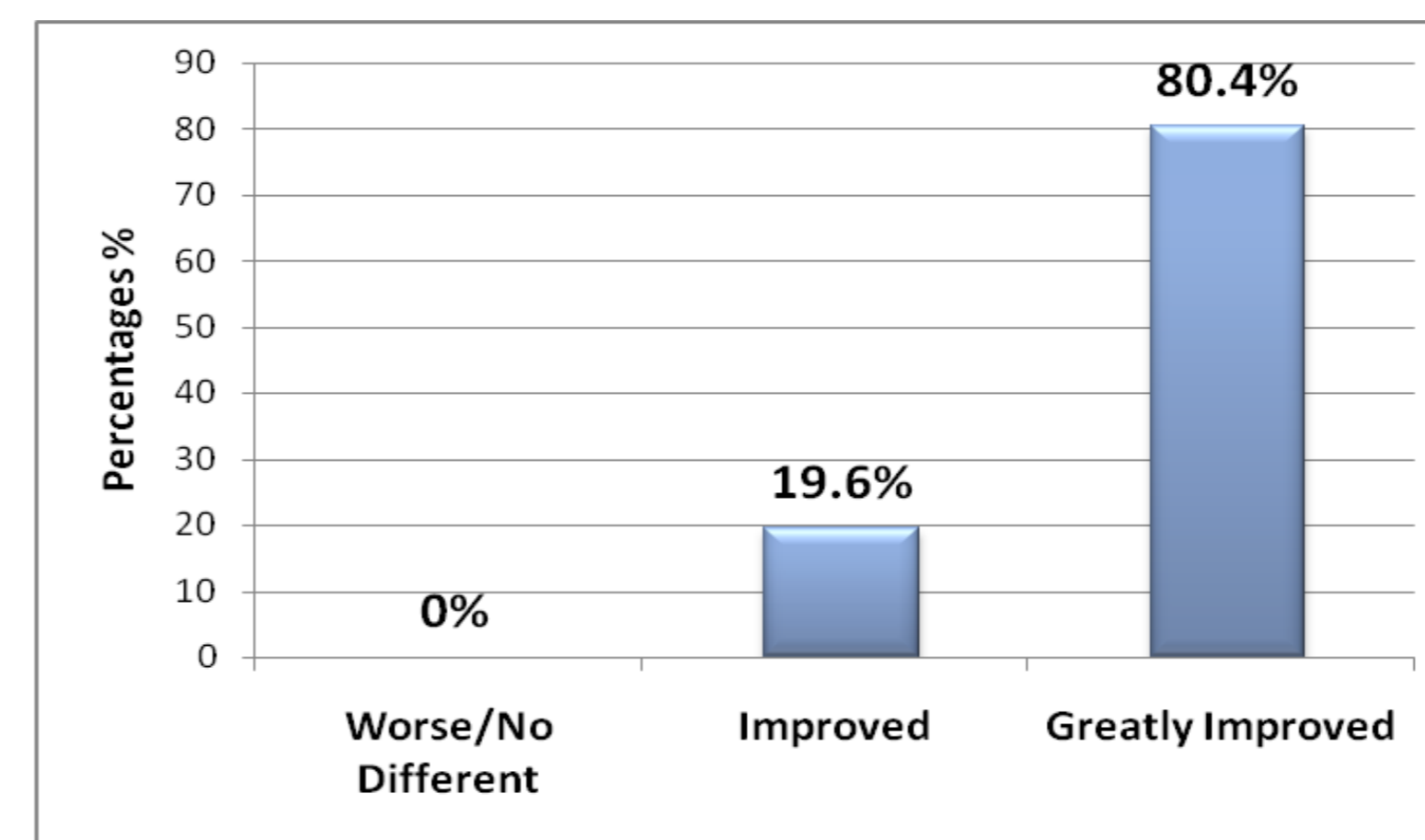


AC of IOTN:
 Grades 1, 2, 3, and 4 - mild treatment need
 Grades 5, 6, and 7 - moderate treatment need
 Grades 8, 9, 10 - great treatment need

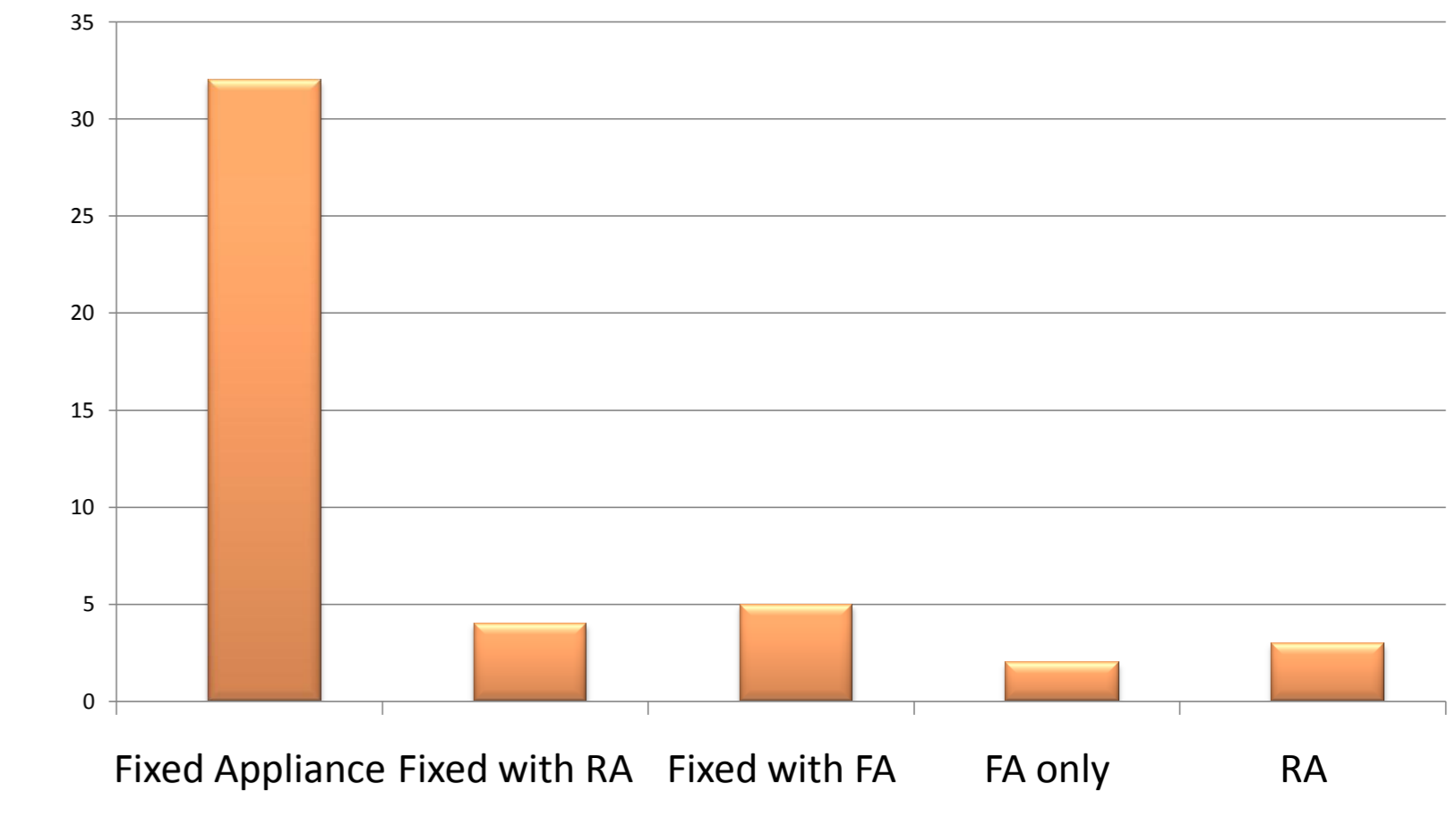


DHC of IOTN:
 Grades 1, 2 - mild treatment need
 Grade 3 - moderate treatment need
 Grades 4, 5 - great treatment need

Results (cont.)



Percentage of PAR Improvement



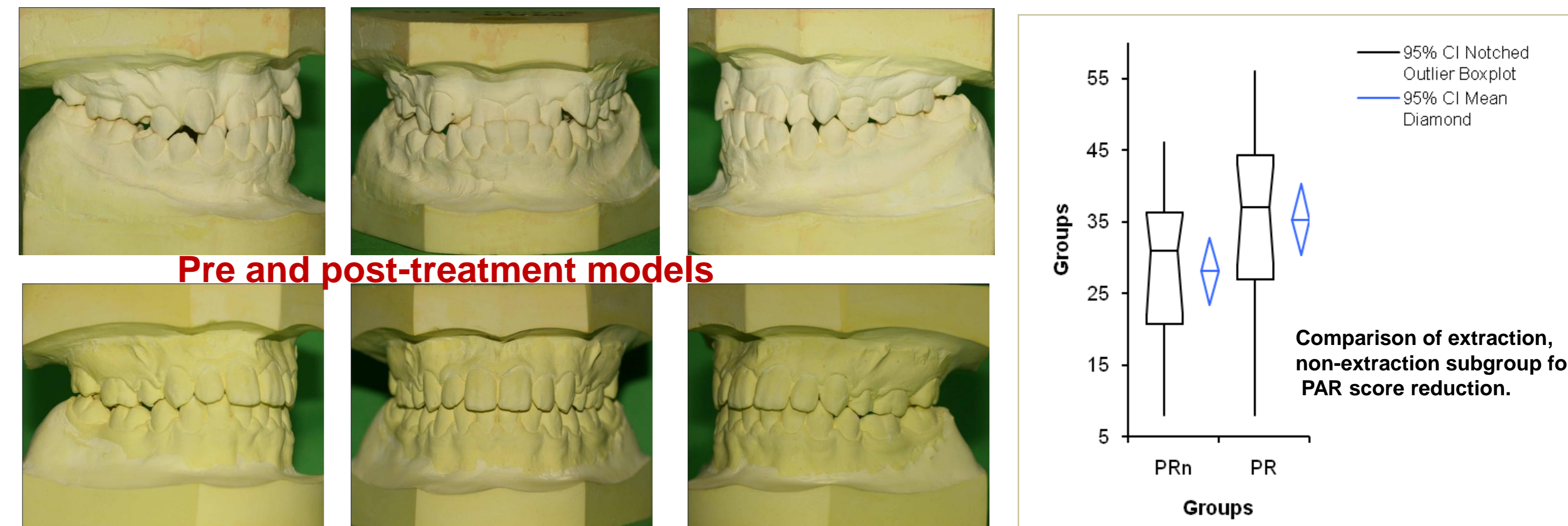
Appliances used

| Female v Male | F | M | Mean F | Mean M | S.D Female | S.D. Male | Mean diff | P Value | Significance |
|---------------|----|----|--------|--------|------------|-----------|-----------|---------|--------------|
| PUWP | 35 | 11 | 16.8 | 19.1 | 6.4 | 6.9 | 2.3 | 0.3081 | NS |
| PWP | 35 | 11 | 34.3 | 38.5 | 11.4 | 12 | 4.1 | 0.3090 | NS |
| ATUWP | 35 | 11 | 3.2 | 3.6 | 1.9 | 2.2 | 0.4 | 0.5591 | NS |
| ATWP | 35 | 11 | 3.2 | 3.6 | 1.9 | 2.2 | 0.4 | 0.5591 | NS |
| PUWP red | 35 | 11 | 31.1 | 34.8 | 11.5 | 12.5 | 3.7 | 0.3662 | NS |
| % Change | 35 | 11 | 88.7 | 89 | 7.6 | 6.2 | 0.3 | 0.8927 | NS |

There were no significant differences in PAR improvement in gender subgroups

| Descriptive for PAR Index | Mean | SD | SE | Range |
|---------------------------|-------|-------|------|----------|
| Pre-treatment PAR Score | 35.30 | 11.60 | 1.71 | 10 to 57 |
| Post-treatment PAR Score | 3.30 | 2.00 | 0.29 | 1 to 9 |
| PAR reduction | 32.00 | 11.70 | 1.73 | 8 to 56 |
| Percentage reduction | 88.70 | 7.20 | 1.07 | 66 to 98 |

Mean Pre-treatment PAR was 35.30 ± 11.6SD, mean post-treatment PAR score was 3.3 ± 2.0SD, PAR reduction was 32.0 ± 11.7SD. Percentage improvement was 88.7 ± 7.4%SD

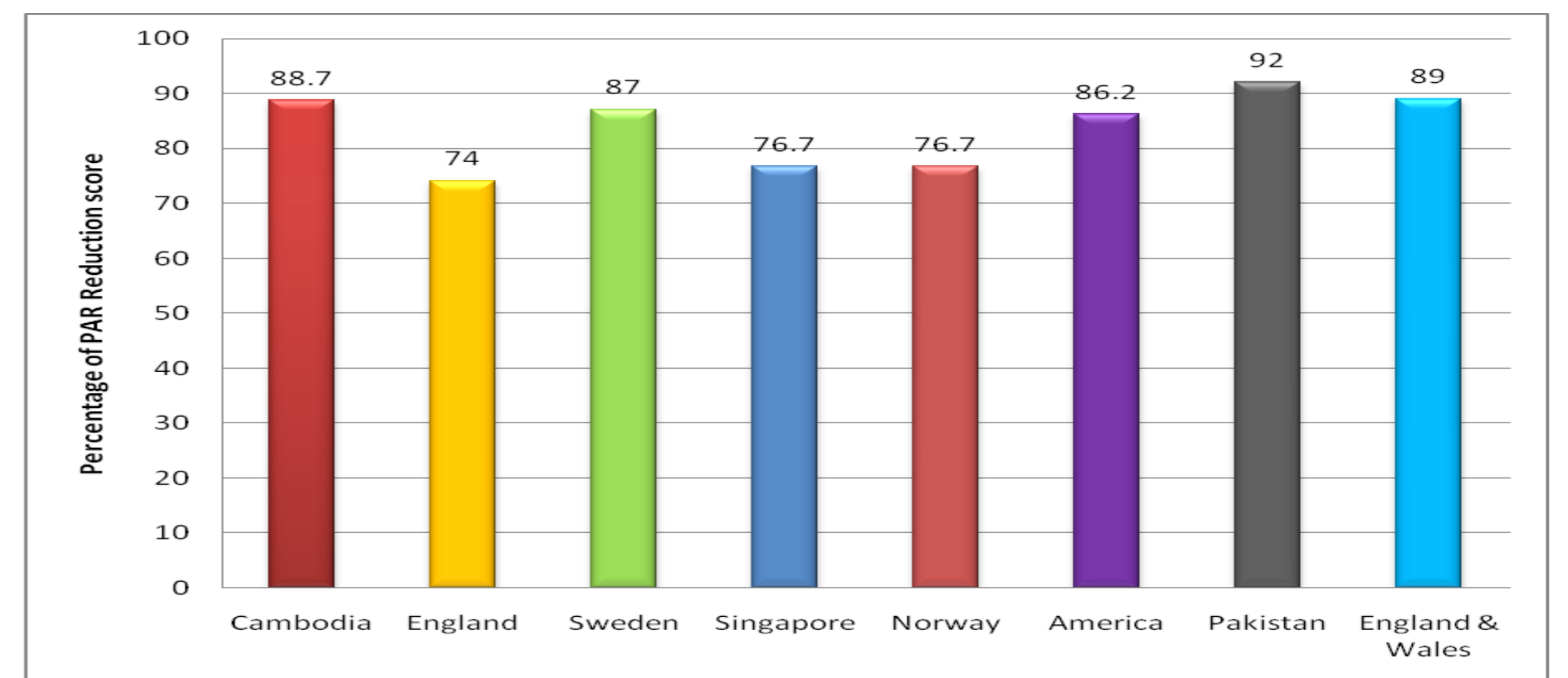


Pre and post-treatment models

Comparison of extraction, non-extraction subgroup for PAR score reduction.

Discussion

Richmond *et al* (1992) proposed that a high standard of care existed when less than 5% of cases fell in the "Worse or No different" category, the mean percentage reduction in weighted PAR score exceeded 70% and finally 40% were in the "Greatly improved category". In this study no case fell in the "worse no difference" group. The PAR score reduction was 89% and 80% were in the greatly improved category suggesting that the Orthodontic Department is treating a substantial proportion of patients with significant malocclusion to high standard of care.



Percentage of PAR score reduction for different countries

Conclusion

The orthodontic treatment outcomes compared favorably with that of other orthodontic providers internationally. A significant proportion of the patients had a clear need for treatment. A significant positive correlation was found between pre-treatment PAR score and pre-treatment Index of Orthodontic Treatment Need (IOTN) score and the percentage reduction in PAR score. Correlations with age, gender, and selected treatment modalities were not statistically significant.

References

1. Richmond S, Andrews M. Orthodontic treatment standards in Norway. *European Journal of Orthodontics*. 1993 Feb;15(1):7-15.
2. Shaw WC, Richmond S, O'Brien KD. The use of occlusal indices: A European perspective. *American Journal of Orthodontics and Dentofacial Orthopedics*. 1995 Jan;107(1):1-10.