Title: Smoking and its Impact on Orthodontic Treatment/Management Modalities: A Systematic Review and Meta-Analysis.

Author Name: Mohammad Khursheed Alam, Haifa Ali Almutairi, Rowida Saleh Barayan, Huda Abutayyem, Haytham Jamil Alswairki, Ahmed Ali Alfawzan, Mohammad Younis Hajeer, Ahmed Saleh Albalawi, Khalid Hussain Ali Alruwaili, Rakhi Issrani.

Abstract: Background: We aimed to review studies that evaluated the effect of cigarette smoking on orthodontic treatment methods and determine whether the smoke affected appliances in a way that could impair the effectiveness of the overall treatment strategy. **Methods:** PubMed, Google Scholar, Cochrane Library, and Web of Science were scoured using pertinent keywords, reference searches, and citation searches in accordance with the PRISMA protocol regarding articles published from 2008 till 2022. **Results:** Ultimately, 7 papers were chosen for further analysis at the end of the selection protocol. Overall pooled odds ratio (OR) for the impact of cigarette smoking on orthodontic treatment was 0.25 (95% CI: 0.15, 0.43), with high statistical significance (P<0.00001) but also high heterogeneity (I^2 = 81%). The relative risk (RR) was 0.50 (95% CI: 0.38, 0.66), indicating a 50% greater risk of noticeable impact, with high statistical significance (P<0.00001) and high heterogeneity (I^2 = 79%), and the risk difference (RD), which was -0.33 (95% CI: -0.45, -0.21), suggesting a 33% higher risk of noticeable impact, with high statistical significance (P<0.00001) and high heterogeneity (I^2 = 81%). The high heterogeneity in all measures indicates significant variability in the results across the included studies. **Conclusion:** All the 7 studies selected for our systematic review exhibited significant detrimental associations between smoking and orthodontic appliances and other modalities that were exposed to cigarette smoke. However, more studies need to be done in this regard, since the literature currently available on this relationship is quite poor and lacking in concrete evidence.

Keyword: Cigarette Smoking, Miniscrews, Orthodontics, Orthodontic Appliances, Orthodontic Wires.

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