

# OSC18: A Systematic Review and Meta-Analysis on Weathering and Aging Effect of Maxillofacial Silicone's Physical Properties

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**Aim:** This review systematically compares the changes on the physical properties of maxillofacial prosthetic materials in terms of (1) without aging, (2) after natural or artificial accelerated aging, (3) after outdoor weathering.

**Materials and Methods:** Relevant articles based on a PICO model and Prisma flowchart were identified using an electronic search in the PubMed, Scopus and Google Scholar databases. Linear Correlation test of the selected 37 articles were performed, following a Kappa-Concordance analysis for interobserver agreement. Random effects meta-analysis of 5 studies out of 37, and also individual subgroup analysis were done by Forest plot to compare the effect of outdoor weathering and natural/artificial/accelerated aging on the tensile strength properties of specific maxillofacial silicone elastomers.

**Results:** Amongst the 37 articles, 14 were without aging, 15 with accelerated aging, 7 had outdoor weathering, and 1 contained both artificial aging and outdoor weathering. The correlation coefficient ( $r = 0.957$ ) indicates a rapid linear increase in the number of published articles since 1969. The meta-analysis of the 5 studies together (effect size: 0.497; 95% confidence interval [CI]: 0.231, 1.073), and the 2 subgroup analysis (effect size: 0.317, 95% confidence interval [CI]: 0.137, 0.733; effect size: 0.471, 95% confidence interval [CI]: 0.175, 1.266 respectively) all favoured case groups, indicating that tensile strength is affected by aging.

**Conclusion:** Aging and weathering greatly affects silicone's physical properties. Thus, modified facial silicones need to

be identified to provide sufficient resistance against different aging conditions.

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