21. **Peformance Assessment of Hand-held Shade Matching Lights**

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Objective: To compare shade matching results obtained using four different dental hand-held lights.

Materials: A total of 92 students were enrolled to perform shade matching and were randomly divided into four hand-held test light groups (Group I–Demetron Shade Light, KerrHawe; Group II–Shade Wand, Authentic Dental Laboratory; Group III–Rite.lite, Practicon Dental; Group IV–TrueShade, Optident), n=23. Half the students worked with one of the four test lights in the first session and with a professional viewing booth (control) in the second session. The remaining half performed the opposite order. Task tabs were positioned at the upper central incisor socket of a stationary mannequin head while students matched four Vitapan Classical shade tabs–(B1, A2, A3, and A4) using the Linearguide 3D Master shade guide. The time between sessions was 4 weeks. Color difference between the task tabs and all Linearguide 3D Master tabs was calculated. An ordinal score (0=worst, 10=best) was assigned to shade-matching performance. To satisfy distributional assumptions for the extremely skewed ordinal data, SPSS 17 GENLIN Generalized Estimating Equations were employed to test (α=0.05), in a four factor design, whether gender, shade tab, test light, or lighting condition (test light vs. control) affected matching performance.

Results: The median shade-matching score was 9.0 among hand-held light and control groups. Analyses showed no significant main effects for gender, shade tab, test light, and lighting condition, but revealed a significant ($p<0.001$) 4-way interaction. Within groups, only Group III showed no significant ($p<0.05$) main or interaction effects for gender, shade tab, or lighting condition.

Conclusion: Shade-matching performance of hand-held and control lights significantly differed in complex ways depending upon combinations of gender, shade tab, and lighting conditions. Only the RiteLite consistently demonstrated no significant differences compared with the control lighting across all shade tabs and regardless of gender.