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Effect of cellophane tape on quality of fingerprints in age groups

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Structured Abstract

Background: The definition of latent print in criminal cases refers to a fingerprint which becomes almost invisible to human sight because it consists of a thin residue layer which from fingerprint ridges. Fingerprint show uniqueness because no two individuals share the same fingerprint pattern or residue. The lifting technique lets forensic examiners transfer fingerprints from one surface to another surface which they need for their fingerprint examination work. The fingerprint lifting technique is a crucial method for collecting and preserving evidence from various surfaces in criminal investigations. The biological and chemical characteristics of fingerprints from adults and children will show different results because their age groups differ. The lifting method used to obtain fingerprints produces different results because various adhesive types exhibit different fingerprinting capabilities.

Methods: The substrate consists of 10 mirrors were prepared as a clean, non-porous surface. The study selected 6 donors who included 3 adults and 3 children as fingerprint donors for their research. The research included five time points which were Day 0, Day 7, Day 14, Day 21, and Day 28 to evaluate the fingerprint quality. The fingerprints were developed at the aging time points given with the silk black powder after the deposition. The researchers used Centre for Applied Science and Technology (CAST) modified scoring system to assess the developed products. The statistical analysis was done by using a linear regression equation, $Y= mx + c$, where y is fingerprint quality, m is the rate of degradation, x is the aging period, and c is the predicted quality of fingerprint.

Results: Adult fingerprints start with higher quality than children's at Day 0. While both degrade over time, children's fingerprints degrade significantly faster, meanwhile adult's fingerprints had gradual decrease of fingerprint quality Initially, Tape A performs better due to stronger adhesion, but Tape B preserves fingerprint quality more effectively over longer aging periods.

Conclusion: In conclusion, the findings of this study indicated that adult fingerprints are more stable and last longer than children's fingerprint. As for Tape performance, Tape B is the superior and reliable choice for lifting aged fingerprints from non- porous surfaces.

Keywords: Latent fingerprint, Adhesive tapes, rate of degradation, adult fingerprint, children fingerprint

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