

EFFECT OF COSMETICS AND SANITIZER ON THE QUALITY OF LATENT FINGERPRINT

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INTRODUCTION

As we are in the modern era, we use distinct products in our daily life on various parts of the body. Due to the COVID (Coronavirus Disease) pandemic, we started using sanitizers on our hands, and the usage of various products such as lotion, creams and oils. Some of these products could affect or deteriorate or degrade the original fingerprints over time, and there is a probability of getting a chance print (oil, sanitizer, lotion applied print) that suspects may use these substances during their criminal conviction, making it difficult for the forensic expert to identify a criminal due to the product properties. Fingerprints are important and the best forms of physical and commonly used forensic evidence over DNA (Deoxyribonucleic acid) profiling because of their uniqueness and are commonly used by forensic scientists as reliable evidence.

AIM

To develop the latent fingerprint stained by oil, lotion, and sanitizer at different intervals to identify the efficiency of the latent print.

METHODOLOGY

For this study, a control sweat print was taken both on porous and non-porous surfaces, followed by a sweat print after application of oil, lotion, and sanitiser each separately on both porous and non-porous surfaces.

The fingerprints were analysed on days 1, 7, 14, 21, and 28 consecutively and compared with the control print.

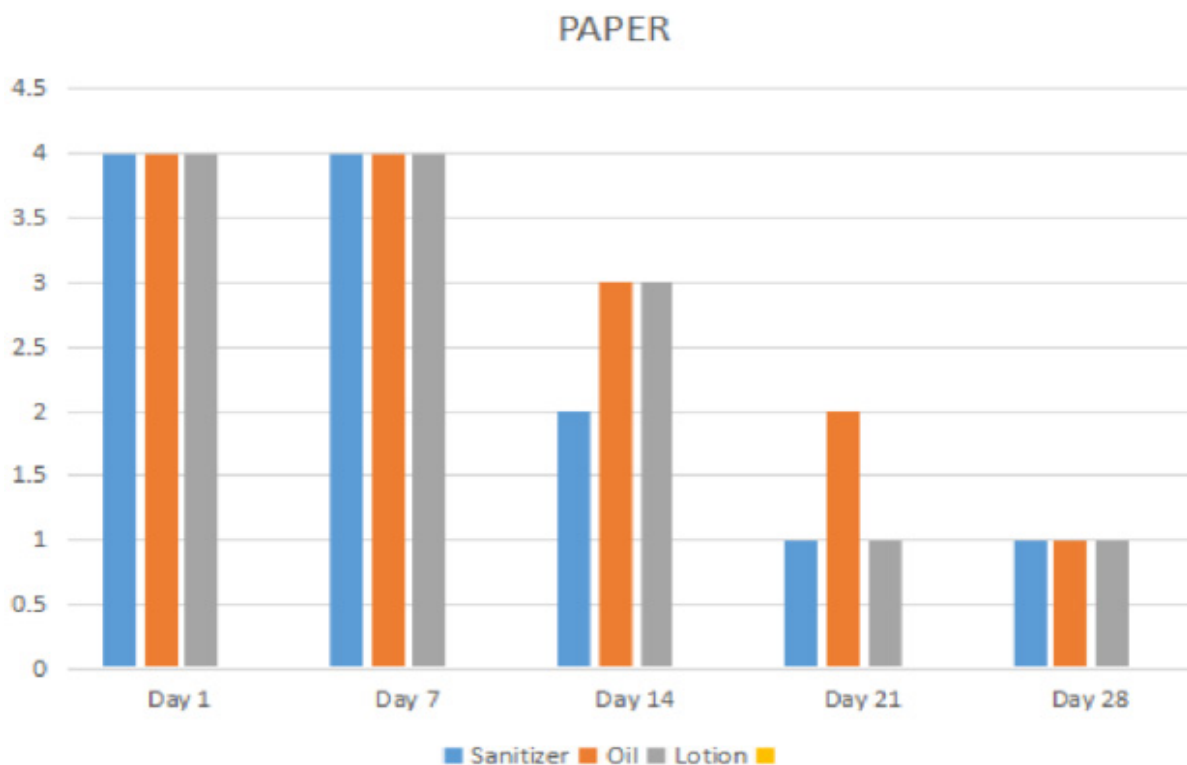
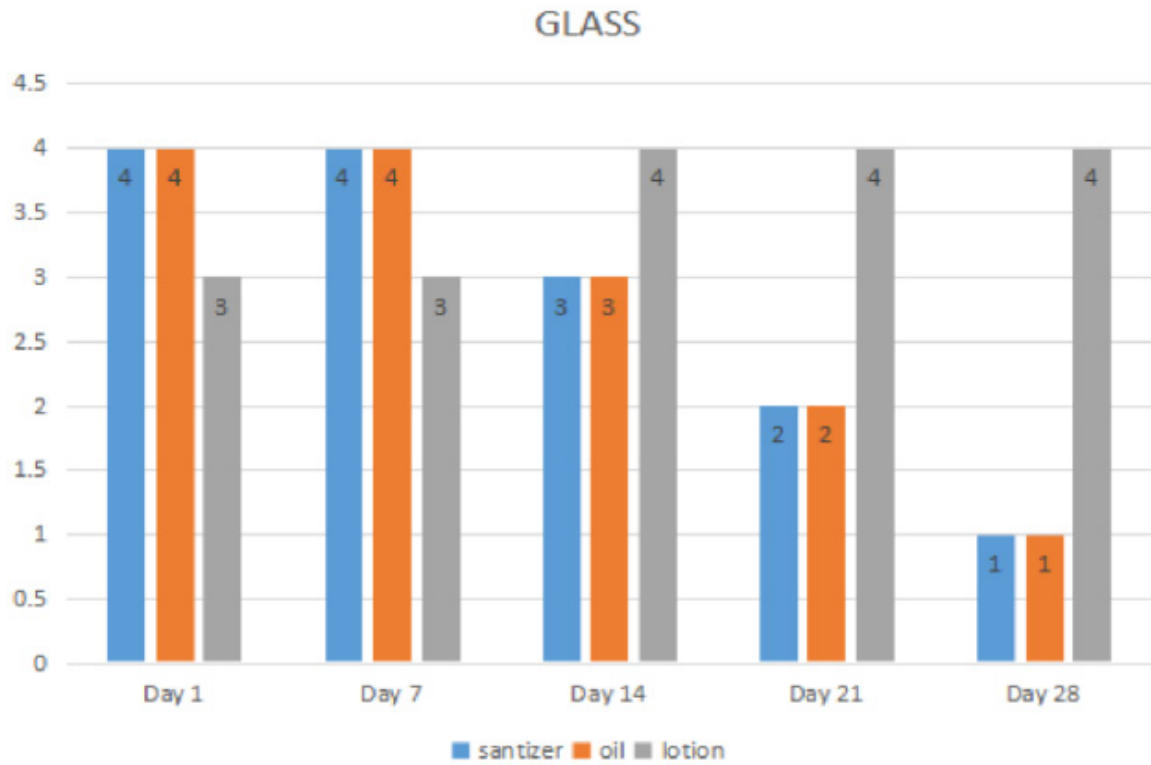
The following scale was used to classify/grade the prints

Visibility score value	Classification of prints	Ridge visibility and level-1,2,3 features of fingerprint
5	Very good visibility (sweat control sample)	Identifiable friction ridges across the print. Classifiable fingerprint pattern (arch, loop, or whorl). Core and the minutiae are visible. Individual scars are also visible.
4	Good visibility	Friction ridges are visible on the portion of the print. Identifiable pattern. Partially visible minutiae and partial merging of ridgelines. Very less smudges found.
3	Poor visibility	Only two-thirds of the print has visible friction ridges. Some parts of the print may be smudged. Partially visible fingerprint pattern. Less prominent appearance of minutiae and scars. The core is visible and less merging of ridgelines.
2	Bad visibility	Only one-third of the print has visible friction ridges. Partially or less prominent visible fingerprint pattern. No minutiae or scars are seen. The core may or may not be seen. Smudges may be present all over the print.
1	Blur/No print	No print is visible or only the outline of the print is visible

The findings were documented.

RESULTS

Comparison charts of different fingerprint quality on porous and non-porous surfaces up to day 28



From the above illustrated graphs, we come to know that the oil, sanitizer, and lotion have the same effect on the paper surface on day 1 and day 7, as shown in the figure and the graphical representation.

On day 14, the lotion and oil print has the same visibility score value, but here the sanitizer print has lesser quality than the other two products when it is placed on the paper surface.

On day 21, two-thirds of the print is clearly visible other than the oil; the other two products have lesser quality than the oil on the paper surface.

On day 28, all the prints have the same visibility score in which the print is less in quality, and thereby on paper surface, all the prints are deteriorating day by day. As this is a paper surface, the print is absorbed and degrading accordingly day by day.

Because of the oil viscous nature and lotion non greasy nature and some properties in the sanitizer make the print deteriorate.

DISCUSSION

Despite the fact that fingerprints have been used as evidence in forensic science for over a century, advances in the field are still being made. Academic interest in assisting research should rise, as should progress in identifying exogenous elements that are usually found to be modified and used to perpetrate a crime and develop complete knowledge. The main aim of the study is to determine the effect of different daily-use products like sanitizer, lotion, and oil on fingerprint visibility and degradation over a period. The presence of oil, lotion, and hand sanitizer on the distal end of the phalanges affects the fingerprint quality on porous and non-porous surfaces. If the fingerprint pattern reveals clear ridge characteristics, minutiae, and pore details, precise identification of an individual can be made. If the features on the latent fingerprints are influenced by exogenous factors, the investigation will be halted due to a lack of

identification. Any flaw in fingerprint development or procedural error will almost certainly result in the assailant being released or an innocent person being imprisoned rather than a proper conviction.

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