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Estimation of PH of Common Household Soap and Shampoo

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Abstract: *This study's objective was to evaluate the pH of several shampoo and bath soap brands that are sold commercially. The majority of the population uses soaps and shampoos that fall outside the pH range that is typical for skin and hair. Therefore, it is hoped that manufacturers will consider the pH of the soaps and shampoos they manufacture in order to make their products more skin and hair friendly before recommending soap to patients, especially those who have sensitive and acne-prone skin.*

Keywords: Dish soap, dermatology, acne fighting soap.

I. INTRODUCTION

When it comes to preserving the health and integrity of our skin and hair, the pH level of personal care products is crucial. Due to their possible effects on the skin's natural barrier function and the general health of hair strands, bathing soaps and shampoos, as necessary elements of daily hygiene routines, have drawn more attention. The effectiveness and suitability of these products for our skin and hair can be greatly influenced by the pH, which is a measurement of acidity or alkalinity. Understanding the pH properties of bathing soaps and shampoos is essential as people become increasingly concerned with their health and look for items that support their personal care objectives. This analysis attempts to delve into the pH ranges of shampoos and soaps, illuminating their implications for skin and hair care and emphasizing the significance of pH understanding in choosing appropriate products for everyday use. We can enable customers to make knowledgeable choices regarding their personal care routines by illuminating the pH profiles of these items, eventually fostering healthier skin and more bright hair. The pH of typical household soap and shampoo varies greatly depending on the brand and kind, according to the search results. With a pH range of 7 to 10, dish soap is typically neutral to mildly alkaline. [1,2,3]

The idea of the acid mantle originated from the skin's somewhat acidic surface.[4] According to studies, the skin's potential hydrogen (pH) rises in direct proportion to the pH of the cleanser being used. Increased pH results in an increase in Propionibacterium count, irritation, and the dehydrating effect. [5,6,7] It has been suggested that pH changes may contribute to the etiology of several skin conditions. In order to prevent and treat certain skin conditions, it may be important to use skin washing products with a pH of roughly 5.5.[8,9]

II. MATERIALS AND METHODS

Sample collection: Samples of branded shampoos and soaps were gathered from local stores. Ayurvedic soaps, anti-acne soaps, bathing soaps, and soaps marketed for dermatological problems were among them. Additionally, a sample of homemade soap was gathered. We also procured a sample of imported soap to contrast with the identical brand sold in India.

Determination of pH: After calibrating the ELICO L1613 pH metre with the reference solution provided by NICE Chemicals Pvt. Ltd., Mumbai (pH = 7), pH readings were taken. Before the pH analysis, the samples were coded. In order to prevent the person measuring pH from knowing the identity of the material being tested, the procedure was separated so that one person was involved in measuring the sample, another in coding, a third in mixing, and so on. The used distilled water has a pH between 6.24 and 6.88.

Procedure used for soap: A 150 mg soap sample was combined with 15 ml of distilled water, but little lather resulted. For optimum soap dissolution, it was left undisturbed for 24 hours. The pH of each sample was then determined.

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Procedure used for shampoo: A 1.5 ml sample of shampoo is placed in a glass beaker, and 15 ml of water is then added to the sample. It mixes well without creating lather. For 30 minutes, the solution is left undisturbed. The pH of each sample was then determined.

Results:

53 of the 64 soap samples evaluated fell within the pH range of 9.01 to 10. Only two samples fell inside the skin pH range.

Table 1: shows the total number of samples of soap in each pH range.

pH range	No of soap sample in the pH range
5.01-6.00	3
6.01-7.00	0
7.01-8.00	2
8.01-9.00	2
9.01-10.00	55
10.01-11.00	6
Total sample	62
pH: Potential of hydrogen	

Table 2: 64 samples were examined, and five of them were marketed as acne-fighting soaps. Three of these fell between 9.01 and 10 and two between 10.01 and 11 on the scale.

pH range	No. of anti-acne saop sample in the pH range	No. of ayurvedic soap samles in the pH range	No. of samples promoted for dermatological purpose in the pH range
5.01-6.00	0	0	0
6.01-7.00	0	0	0
7.01-8.00	0	0	0
8.01-9.00	0	0	0
9.01-10.00	4	8	2
10.01-11.00	3	0	2
Total Sample	5	8	3
pH: Potential of hydrogen			

Nine of the 64 samples—marked as ayurvedic soaps—had pH values between 9.01 and 10 out of a possible 100. Of the 64 samples, three were advertised for dermatological use. pH values for two of the three were between 9.01 and 10.

The pH range of homemade soap was 9.01 to 10.00. The imported soap sample had a pH between 9.01 and 10, which is the same as that of the identical brand sold in the Indian market. Additionally, other iterations of the same brand were evaluated. Between variants of the same brand, there was only a 0.35 pH difference. The pH of different Brand coded A kinds ranged from 9.62 to 0.08, 7.445 to 0.125 for Brand B, 9.79 to 0.16 for Brand C, and 9.88 to 0.10 for Brand D.

Table 3: Each shampoo sample falls within a different pH range.

pH range	No of shampoo samples in the pH range
4.01-5.00	2
5.01-6.00	5
6.01-7.00	23
7.01-8.00	6
Total sample	32
pH: Potential of hydrogen	

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III. DISCUSSION

Our study's findings showed that just 3.125% of the soap samples examined had a pH that matched the pH of skin, and another 3.125% had a pH that was neutral. After examining these products, it was discovered that they had made reference to their pH and that our study's results agreed with the pH they claimed. The remaining alkaline pH products have not made any reference of the pH level of their goods. Even items marketed as "anti-acne soaps" had a pH level exceeding nine. It is crucial that at the absolute least these products have a pH consistent with that of skin because studies have shown that Propionibacterium is implicated as one of the elements of the pathogenesis of acne and that their count increases on the use of alkaline soap. Even the dermatology products that were recommended had an alkaline pH. Ayurvedic soaps, despite their claims to be superior to conventional soaps, were not pH-friendly for the skin.

The pH of soaps and cleaners was measured using pH paper in a study by Tyebkhan G, and it was discovered that the majority of the population uses soaps with a pH between 7 and 9. Only 3 out of the analysed samples had a pH that was consistent with that of healthy skin.[10] However, in our research, we discovered that the bulk of the samples had pH values between 9.01 and 11. Furthermore, only 2 out of the evaluated samples had a pH that was in line with the pH of the skin. The discrepancy could be attributed to the pH meter's higher accuracy in our investigation as compared to the pH paper.

Experts typically advise using acid-balanced shampoos, but in our investigation, we discovered that 81.58% of shampoos had an acidic pH. Shampoos have a higher pH than soaps, which is better. The majority of the population uses soaps and shampoos that fall outside the pH range that is typical for skin and hair. Therefore, it is hoped that manufacturers will consider the pH of the soaps and shampoos they manufacture in order to make their products more skin and hair friendly before recommending soap to patients, especially those who have sensitive and acne-prone skin.

IV. CONCLUSION

The majority of the population uses soaps and shampoos that fall outside the pH range that is typical for skin and hair. Therefore, it is hoped that manufacturers will consider the pH of the soaps and shampoos they manufacture in order to make their products more skin and hair friendly before recommending soap to patients, especially those who have sensitive and acne-prone skin.

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