

HYPOTHESES TESTING ON ASSOCIATION

- Amrita Mondal

Skincare Beauties are categorized as follows -

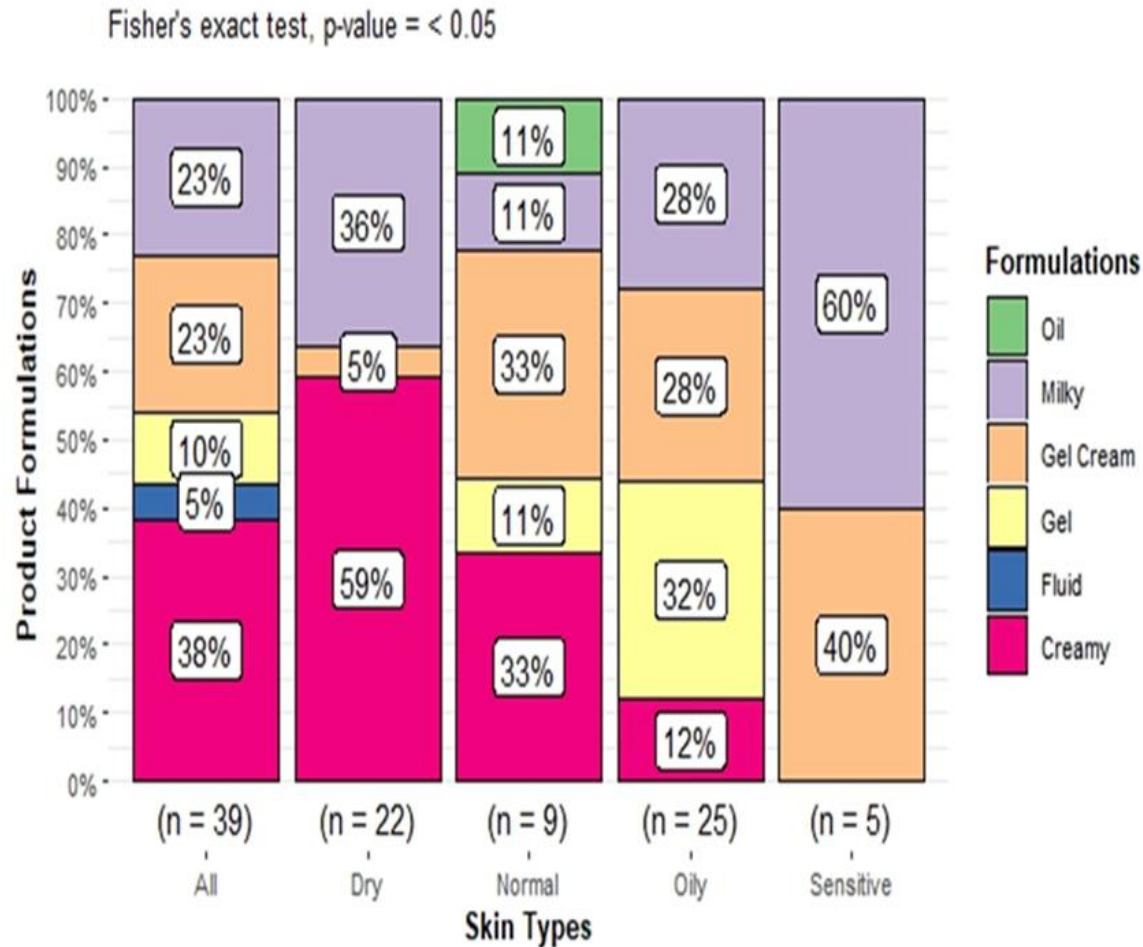
- a. DETOXIFICATION GROUP – Cleanser, Cleansing Oil, Exfoliator
- b. TARGET SPECIFIC MASK – Clay Mask, Mask, Peel-Mask, Night-Mask
- c. SKIN BALANCING SOLUTION – Toner, Essence
- d. TREATMENT POTION GROUP – Serum
- e. SKIN CONDITIONING GROUP – Emulsion, Moisturizer

FISHER'S FREEMAN HALTON TEST

Assumptions:

- i. Both the variables (exposure and outcome) should be categorical.
 - ii. Independence of observations—variable should not be paired or related.
 - iii. Mutually exclusive groups—an individual cannot belong to more than one cell in the contingency table.
 - iv. Most of the expected value in our contingency table are less than 5, we choose Fisher Freeman Halton exact Test for contingency table of $r \times c$.
-
- In some cases, we used Monte Carlo Simulation to obtain p-value based on 2000 replicates.
 - For each test, level of significance $\alpha = 0.05$.
 - If observed p-value < 0.05 (level of significance), we reject Null Hypothesis at 5% level of significance and conclude with 95% confidence that there is significant difference.

ASSOCIATION BETWEEN SKIN TYPE & PRODUCT'S FORMULATIONS

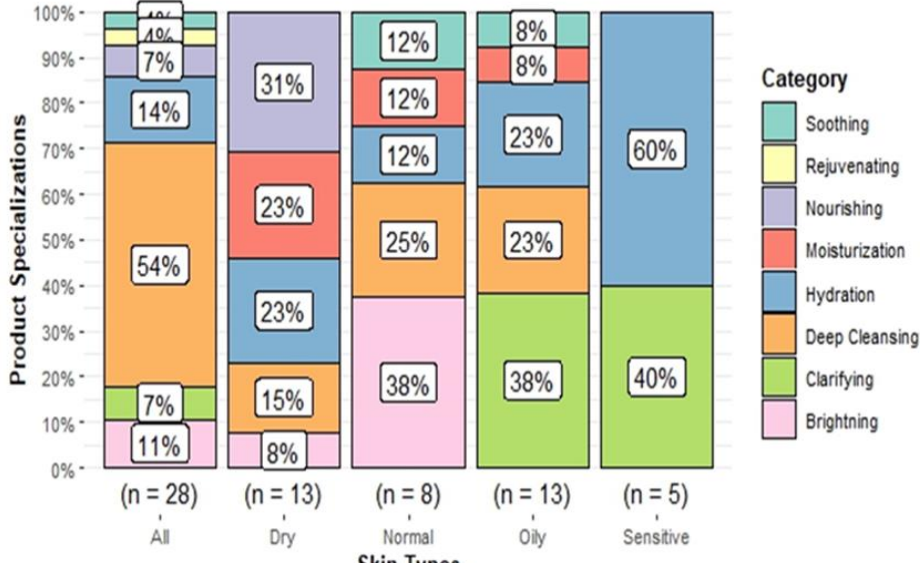


- Null Hypothesis : No significant difference between skin type and product's formulation.
- Alternative Hypothesis : Significant difference between skin type and product's formulation.

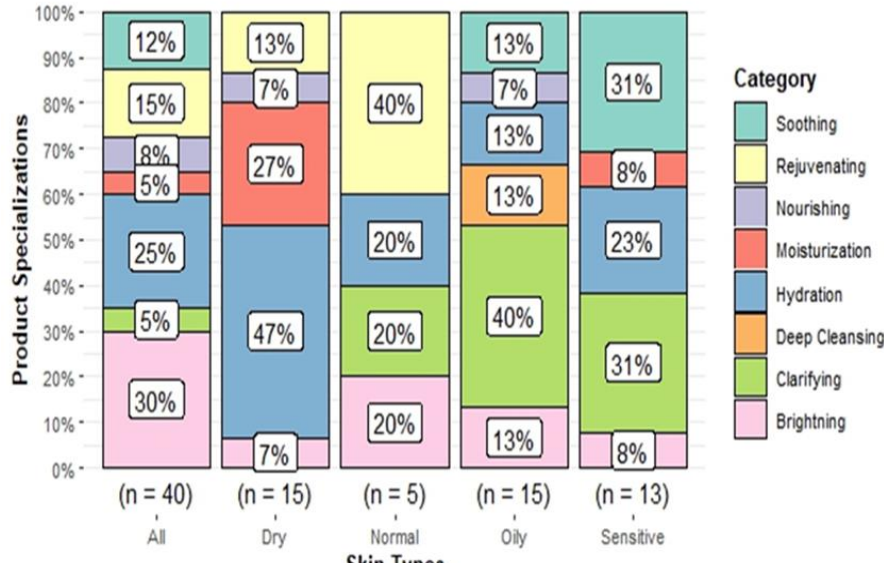
Group A: Cleanser, Cleansing Oil, Exfoliator shows significant difference.

ASSOCIATION BETWEEN SKIN TYPE & PRODUCT'S SPECIALITIES

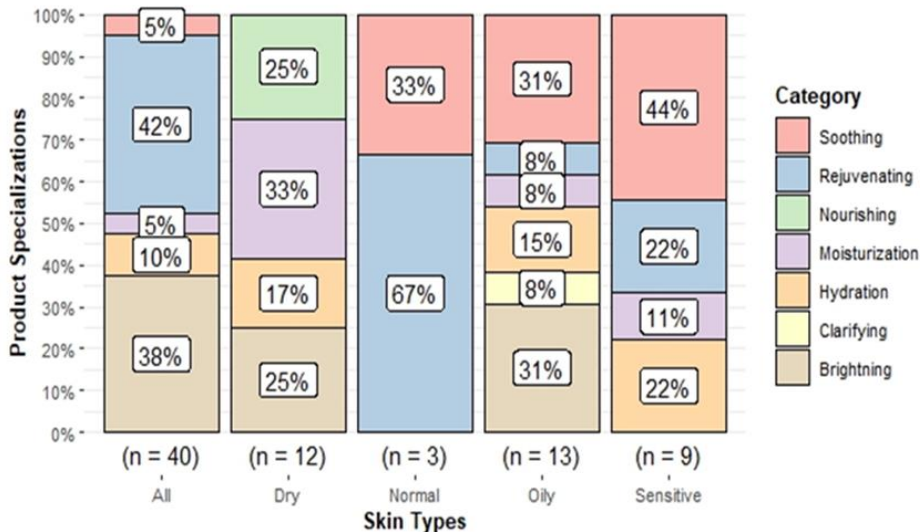
Fisher's exact test, p-value = < 0.05



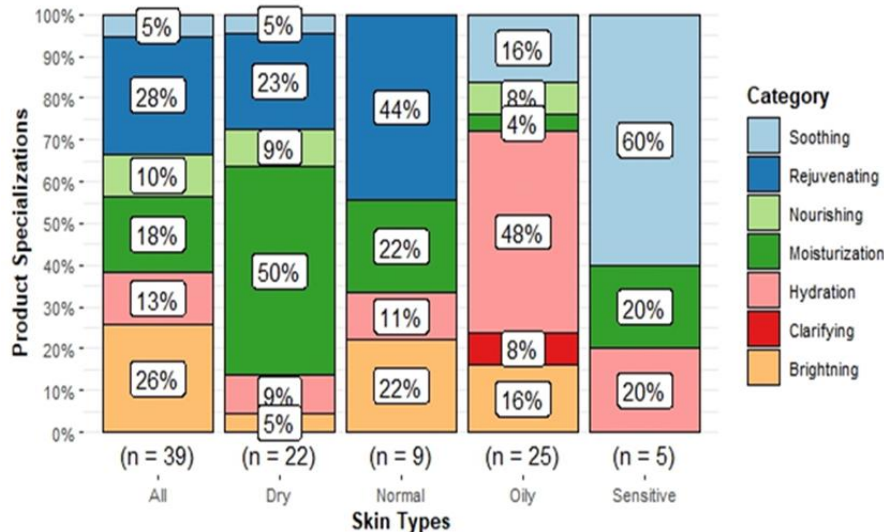
Fisher's exact test, p-value = < 0.05



Fisher's exact test, p-value = < 0.05



Fisher's exact test, p-value = < 0.05

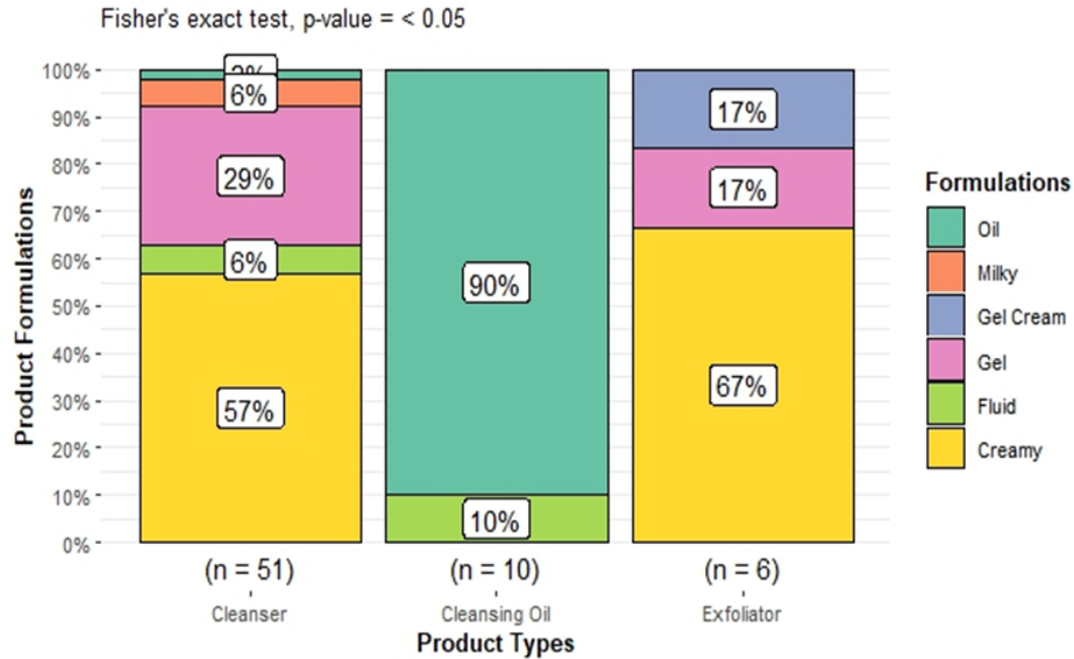


- Null Hypothesis : No significant difference between skin type and product's specialties.
- Alternative Hypothesis : Significant difference between skin type and product's specialties.

Following groups show significant difference -

1. Group A: Cleanser, Cleansing Oil, Exfoliator
2. Group C: Toner, Essence
3. Group D: Serum
4. Group E: Emulsion, Moisturizer

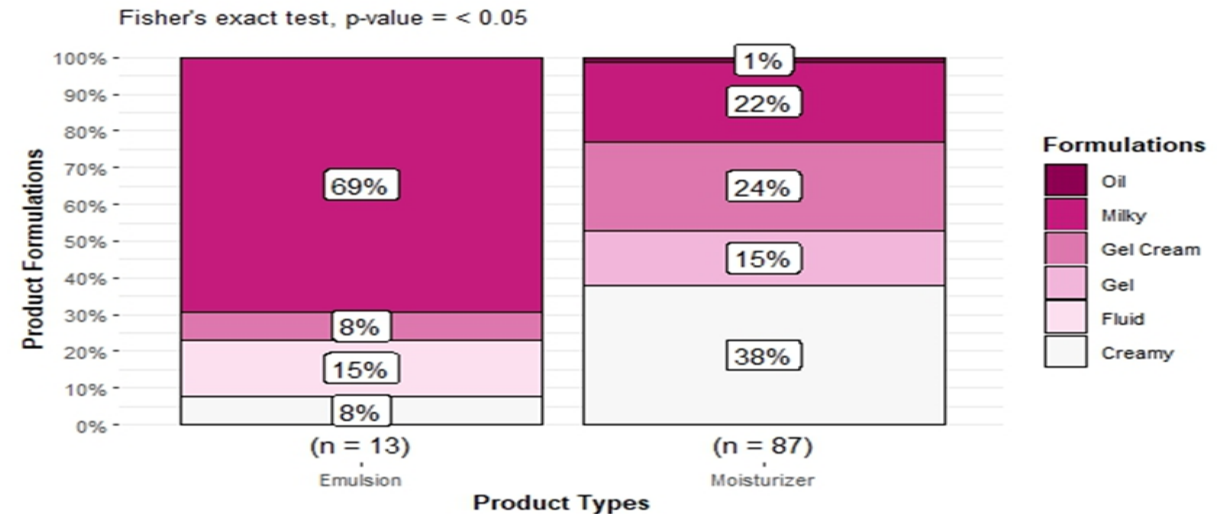
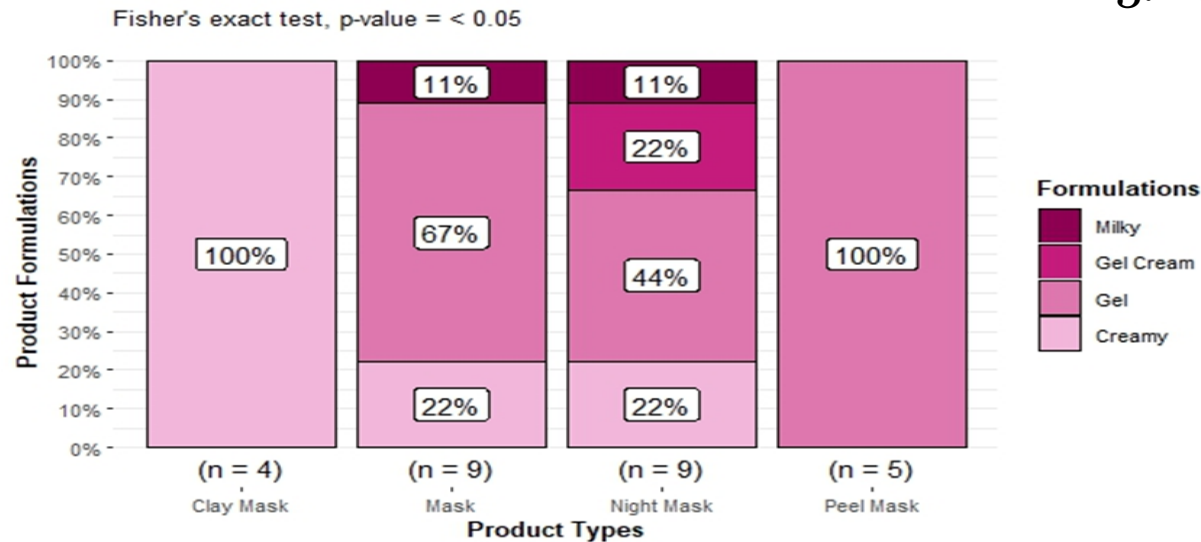
ASSOCIATION BETWEEN PRODUCT TYPE & PRODUCT'S FORMULATION



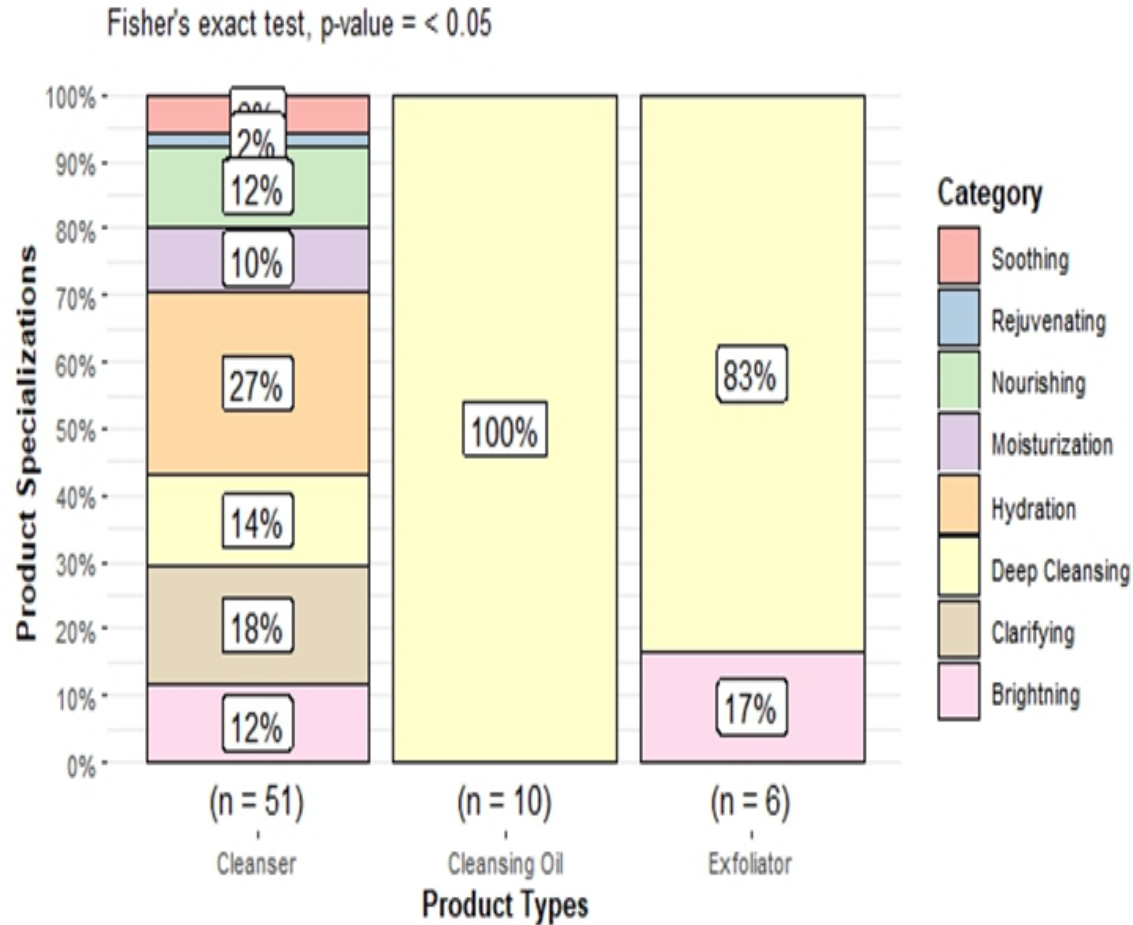
- Null Hypothesis : No significant difference in-between group's product type and product's formulation.
- Alternative Hypothesis : Significant difference in-between group's product type and product's formulation.

There is significant difference in-between the following groups -

1. Group A: Cleanser, Cleansing Oil, Exfoliator
2. Group B: Clay Mask, Mask, Peel Mask, Night Mask
3. Group E: Emulsion, Moisturizer



ASSOCIATION BETWEEN PRODUCT TYPE & PRODUCT'S FORMULATION



- Null Hypothesis : No significant difference in-between group's product type and product's specialities.
- Alternative Hypothesis : Significant difference in-between group's product type and product's specialities.

Group A: Cleanser, Cleansing Oil, Exfoliator shows significant difference in-between group's product and their specializations.

THANK YOU