https://colab.research.google.com/drive/1nEwqFiFti5gHiHdAqnd7HwemTViuENtQ?usp=sharing

Section 1: 1. Scalp hair condition

🧠 Hair & Scalp Health: Consumer Behavioral Study
Tools Used: Python (Pandas, Matplotlib), SPSS, Excel, Power BI
Techniques Applied: Frequency Analysis, Visual Distribution Mapping, Descriptive Statistics
Sample Size: N = 600 respondents

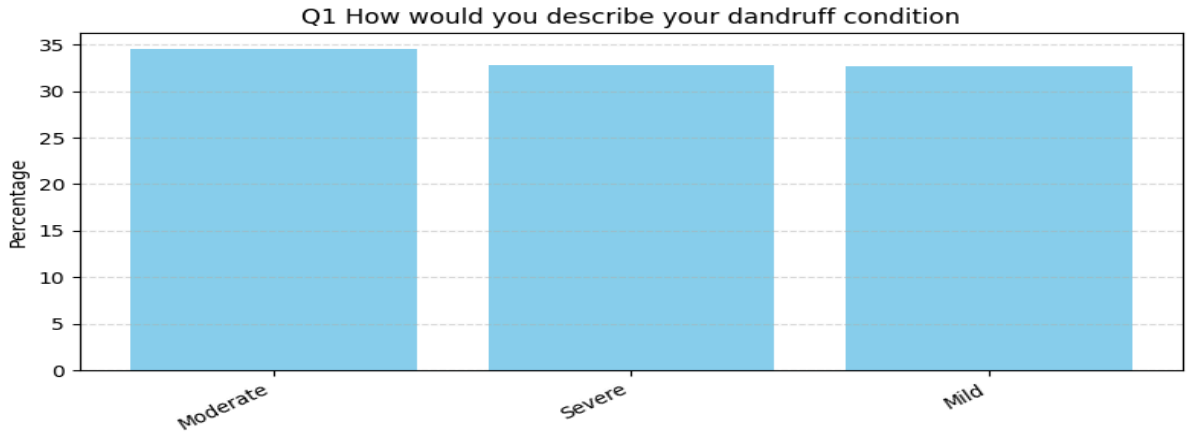
Purpose of Analysis
This study was designed to uncover prevailing scalp and hair health concerns and behavioral care habits to guide product development and marketing strategies. The goal is to convert raw feedback into actionable insights using advanced analytics tools.

🔍 Code Function Description & Analytical Relevance

Responses Distributions:

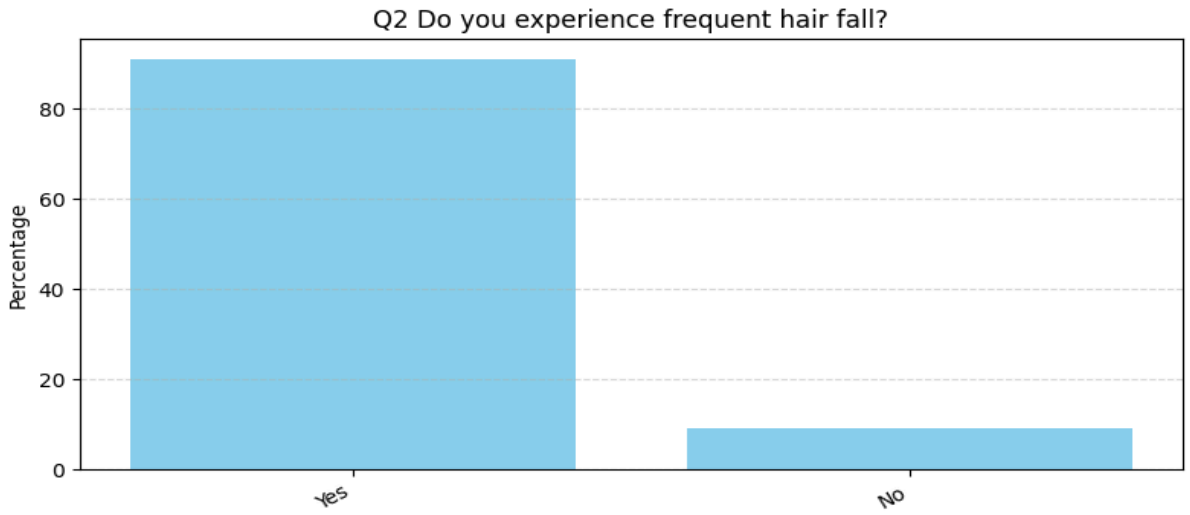
Q1: How would you describe your dandruff condition

- **Moderate (34.5%)**, **Severe (32.83%)**, **Mild (32.67%)**
- This distribution indicates a nearly equal spread, with a slight lean toward moderate dandruff. This suggests that a large part of the target audience experiences noticeable dandruff, but not necessarily extreme.



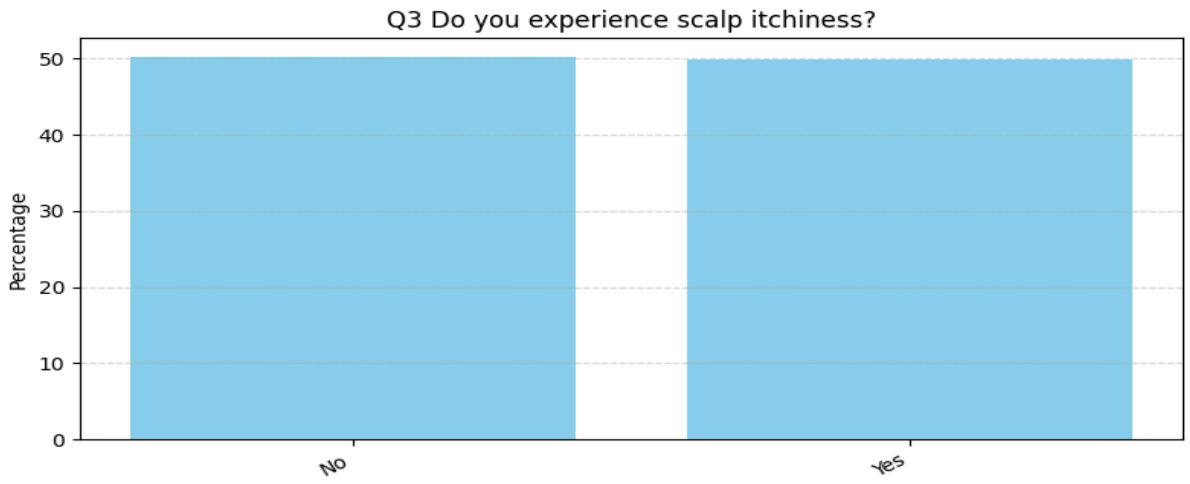
Q2: Do you experience frequent hair fall?

- **Yes (90.83%)**, **No (9.17%)**
- A significant majority report frequent hair fall. This makes hair fall a critical concern in this consumer segment and should be a key message point for any anti-hair fall product.



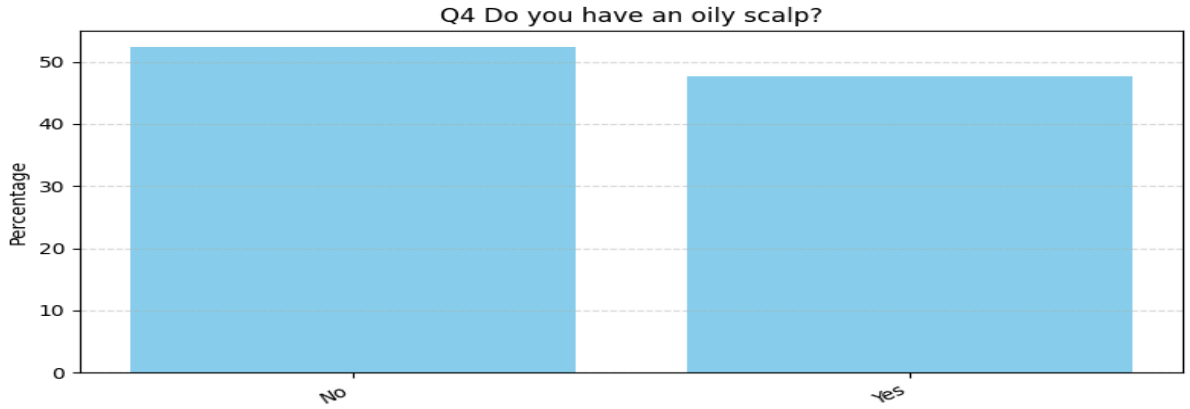
Q3: Do you experience scalp itchiness?

- **No (50.17%)**, **Yes (49.83%)**
- Responses are almost evenly split. This indicates that itchiness is a relevant concern but not universal, hinting at varying scalp conditions across users.



Q4: Do you have an oily scalp?

- **No (52.33%)**, **Yes (47.67%)**
- The result shows a balanced mix of oily and non-oily scalps, requiring hair care products to offer variants for both types.

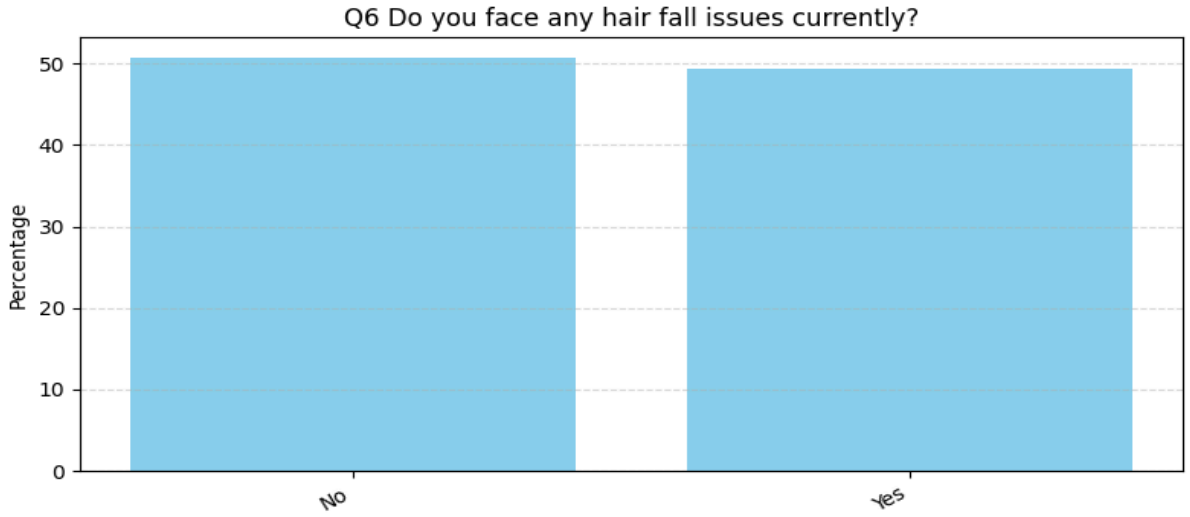


Q5: How long does your hair stay fresh before becoming oily again?

- **Returns in 1 day (27.17%)**, **2 days (26.17%)**, **Few hours (24.83%)**, **More than 2 days (21.83%)**
- The data implies that most respondents feel their hair becomes oily quickly (within 1–2 days), suggesting a need for frequent washing or oil-control formulations.

Q6: Do you face any hair fall issues currently?

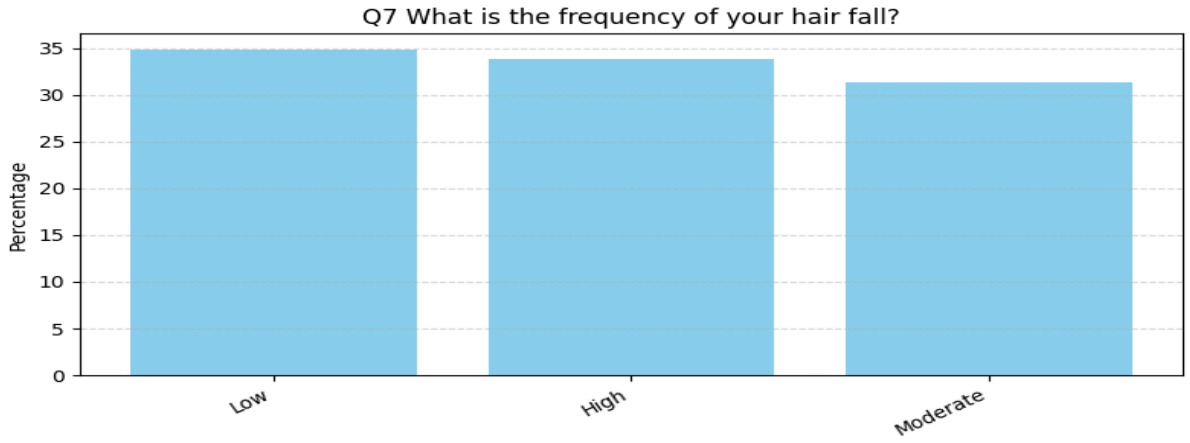
- **No (50.67%)**, **Yes (49.33%)**
- Near-even split suggests that even though 90% said they experience "frequent" hair fall in Q2, the **current** issue may be under control for many — a key insight for product targeting.



Q7: What is the frequency of your hair fall?

- **Low (34.83%)**, **High (33.83%)**, **Moderate (31.33%)**

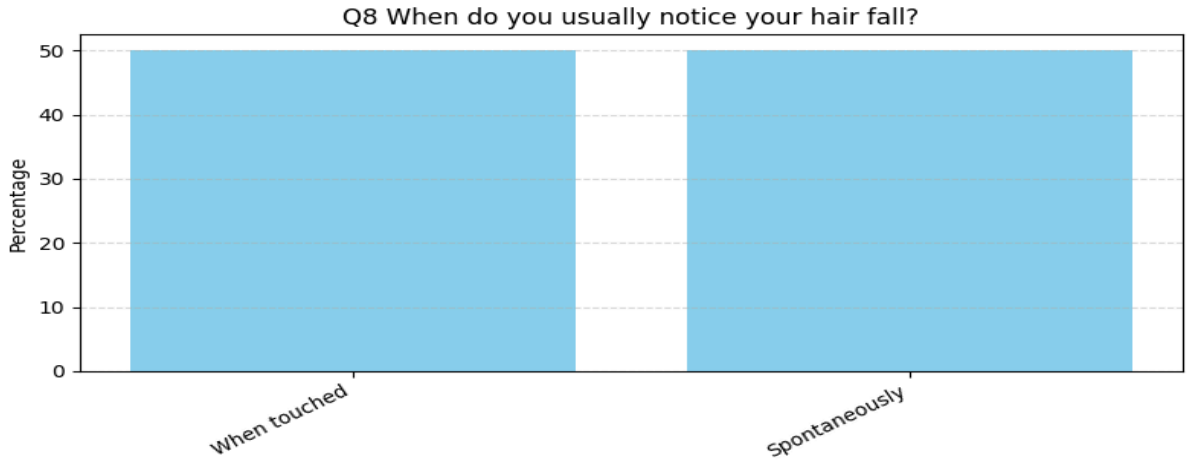
- All segments are almost equally distributed. This indicates that hair fall severity differs widely, reinforcing the need for tiered product solutions (mild, moderate, strong).



Q8: When do you usually notice your hair fall?

- **When touched (50%)**, **Spontaneously (50%)**

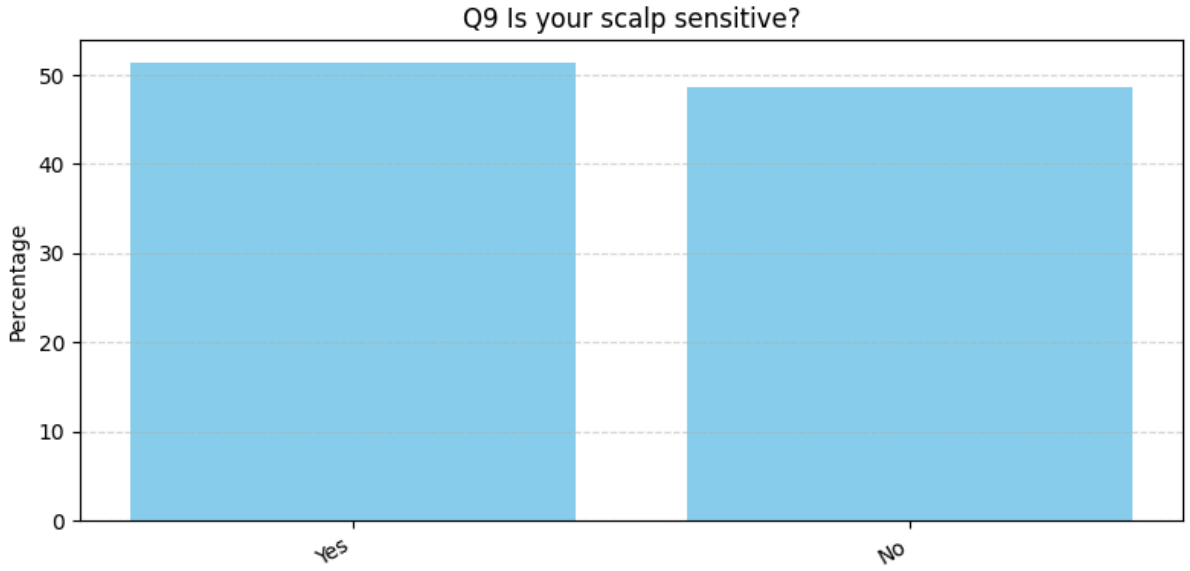
- Perfectly balanced. Suggests two equally relevant pain points: hair strength and spontaneous shedding. Messaging could focus on both angles.



Q9: Is your scalp sensitive?

- **Yes (51.33%)**, **No (48.67%)**

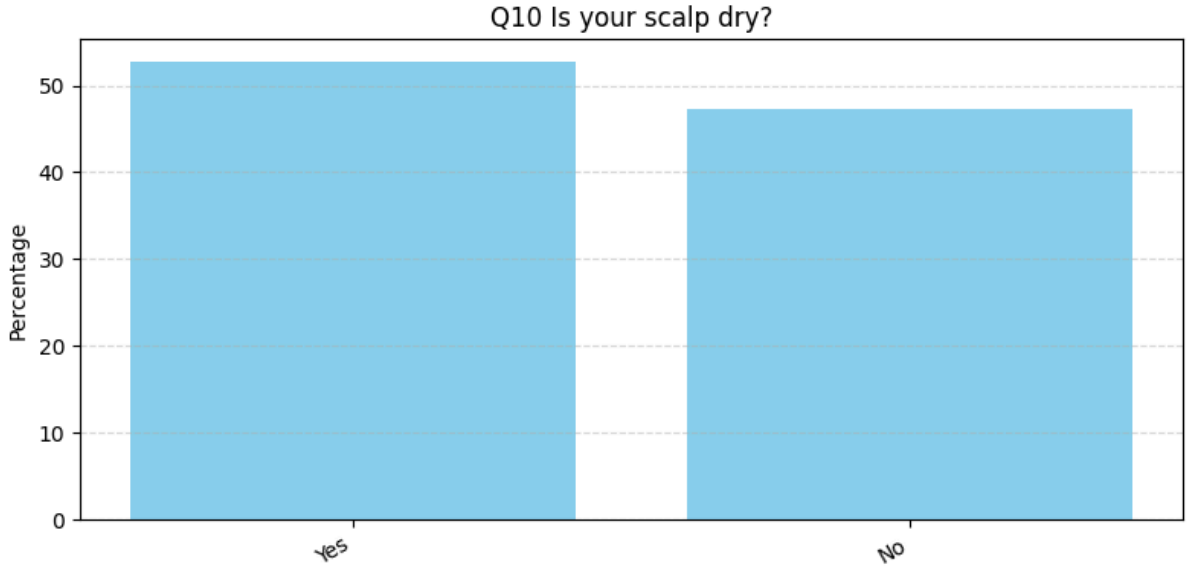
- A slight majority experience sensitivity, hinting that product formulations should consider gentleness and hypoallergenic claims.



Q10: Is your scalp dry?

- **Yes (52.67%)**, **No (47.33%)**

- Majority reports dryness. Indicates that moisturizing and scalp hydration could be important product benefits.



Data link:
https://docs.google.com/spreadsheets/d/1ejnuioXFQa2MBZ4P95fUspL6CNPP3AqmDqG_eoeqtSc/edit?gid=481878267#gid=481878267

2. Skip Logic Validation (Q2 → Q6–Q8):

Explanation of Skip Logic Validation (Q2 → Q6–Q8)

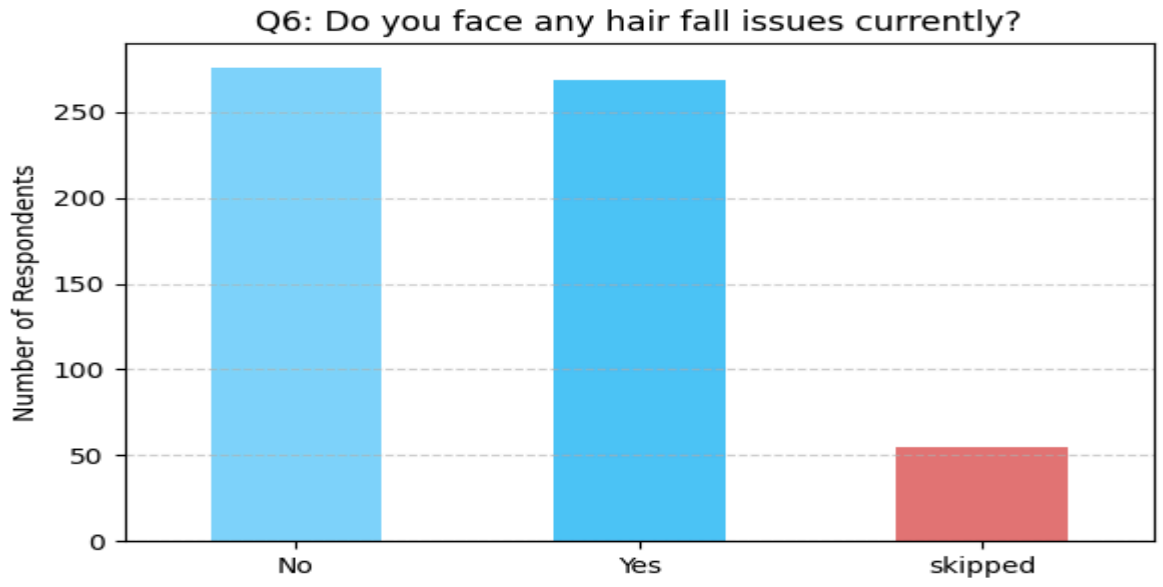
Context:

- Respondents who answered **"No" in Q2** should **skip Q6–Q8**.
- You have **55 skipped responses** across Q6–Q8, which likely aligns with the **9.16% (≈55 out of 600)** from Q2 who said "No".

Key Checks:

✅ **Q6: Hair fall issues currently**

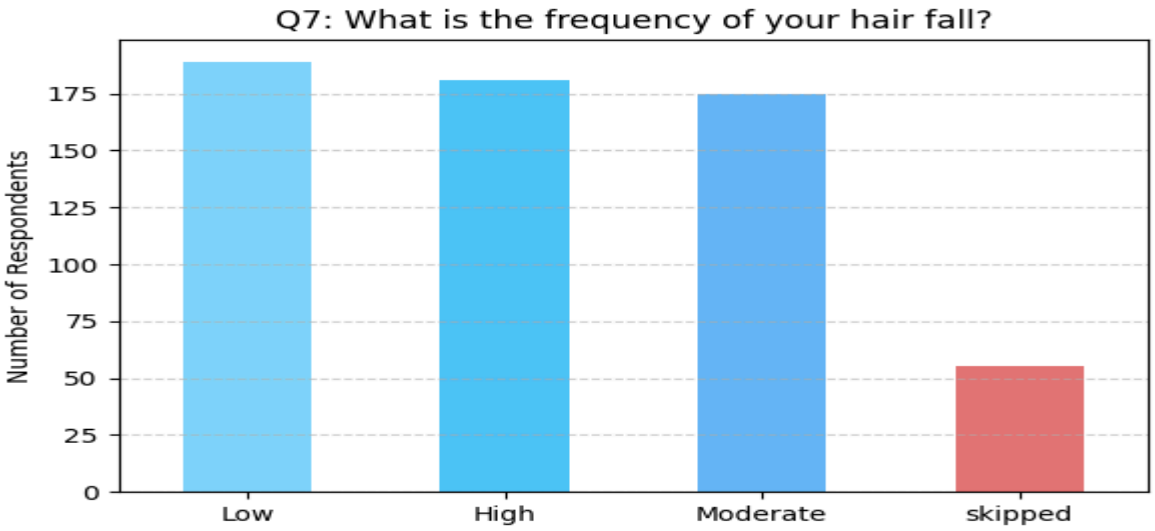
- 269 = Yes
- 276 = No
- **55 = Skipped** ✅ (matches Q2 = No count)



✅ **Q7: Frequency of hair fall**

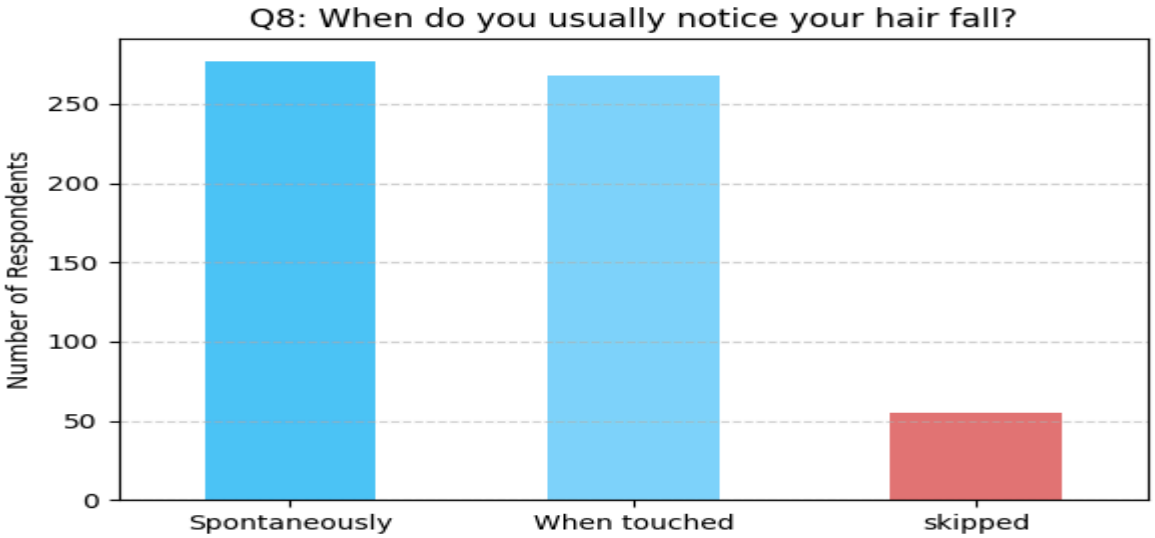
- Total responses = 189 + 181 + 175 = 545

- **Skipped = 55 ✅**



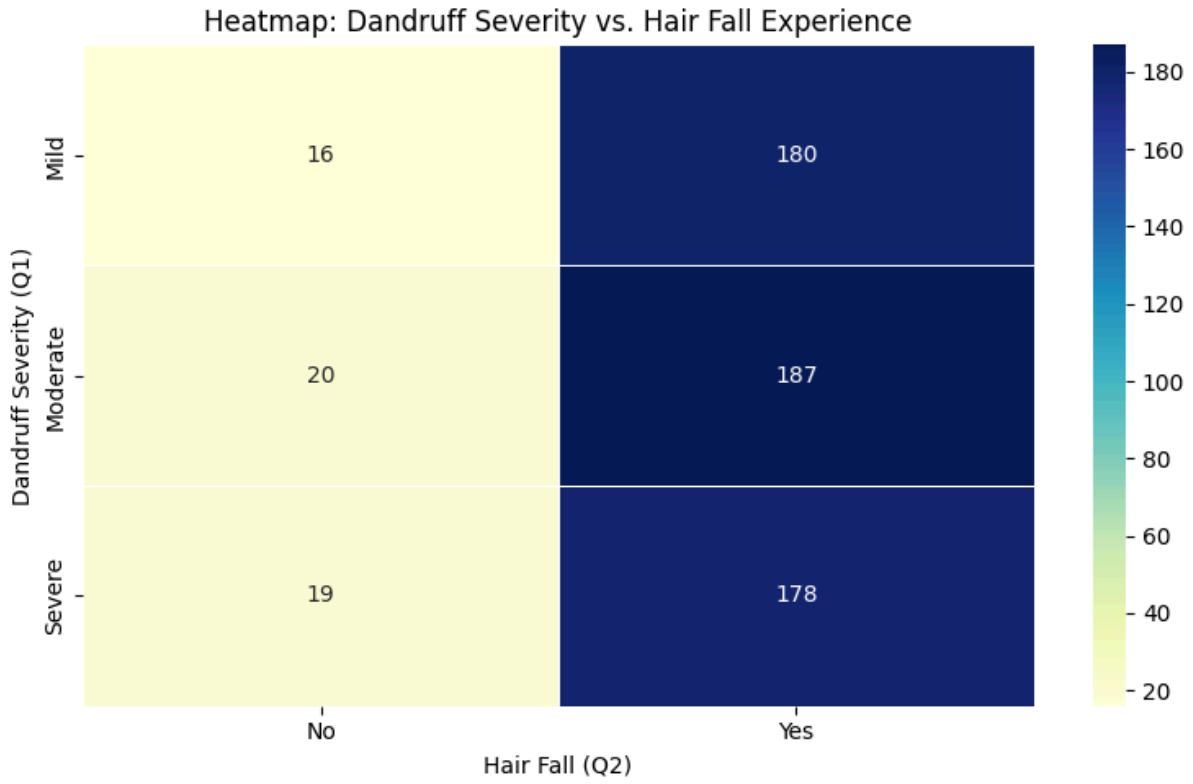
✅ **Q8: When do you notice hair fall**

- 277 (Spontaneously) + 268 (When touched) = 545
- **Skipped = 55 ✅**



3. Cross-Tabulation:

Cross-tab of Q1 (Dandruff Severity) vs. Q2 (Hair Fall).



Output Explanation

- **Color Gradient** shows intensity (darker = more respondents).
- You can clearly see:
    - Higher hair fall counts (Yes) across all dandruff levels.
    - Minimal variation in the “No” category.
- This visual is useful when comparing **volume patterns** across categories quickly.

description:

Why This Matters

Understanding scalp and hair health conditions helps:

- Define core concerns (like dandruff, hair fall, scalp sensitivity).
- Shape targeted product claims and segmentation.

- Ensure logical consistency in survey responses (skip logic).
- Identify significant relationships between key scalp issues (cross-tab insights).

How to Do It

Part 1: Response Distributions

- Read each question (Q1–Q10) and document the % distribution.
- Interpret insights from each distribution to identify trends or splits.

Part 2: Skip Logic Validation (Q2 → Q6–Q8)

- Filter respondents who answered “No” to Q2.
- Confirm that these respondents have missing or skipped responses in Q6–Q8.
- Flag violations (if any) where these were incorrectly answered.

Part 3: Cross-tabulation (Q1 × Q2)

- Create a 3x2 contingency table showing the relationship between dandruff severity (Q1) and hair fall (Q2).
- Analyze patterns (e.g., if severe dandruff correlates with more reported hair fall).

Tools/Modules

- **Excel / Google Sheets**: For initial filtering, skip logic checks, and pivot tables.
- **Python (pandas, seaborn/matplotlib)** (optional for automation or visualization)
- **Power BI / Tableau** (optional for visual dashboards)
- **SPSS / R** (if advanced statistical tests like Chi-square needed for cross-tabs)

Output

- **Insights Summary**: Bullet-pointed observations for each question (Q1–Q10).
- **Skip Logic Report**: % or count of invalid cases + validation status.
- **Cross-tab Table**: Matrix showing Q1 × Q2 with interpretation.
- **Visuals (optional)**: Bar charts for distribution, heatmap or clustered bar for cross-tab.

https://colab.research.google.com/drive/1O2p8YJWujcg618aSNp_MxNhfgjwxRou1#scrollTo=v5c_QfzUl8Ib