

Capstone Project



# Panic Attack Data Analysis

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# Introduction

This project examines 1,200 panic-attack cases to move beyond demographics and reveal how triggers, symptoms, and lifestyle factors relate to panic severity. I used Snowflake SQL to create five summary views and visualized the results in Power BI. Our aim is to surface actionable insights like which triggers or sleep patterns correlate with higher panic scores.





# Presentation Objective

- **Objective:** Identify patterns in panic attacks (triggers, symptoms, lifestyle).
- **Tools:** Snowflake (SQL) for data views, Power BI dashboards for visualization.
- **Goal:** Produce actionable insights to inform interventions and further study.

# Project Agenda

- Data & preprocessing (Snowflake views).
- Key analyses (age, triggers, symptom clusters, sleep/heart rate).
- Power BI dashboards (insights, limitations).



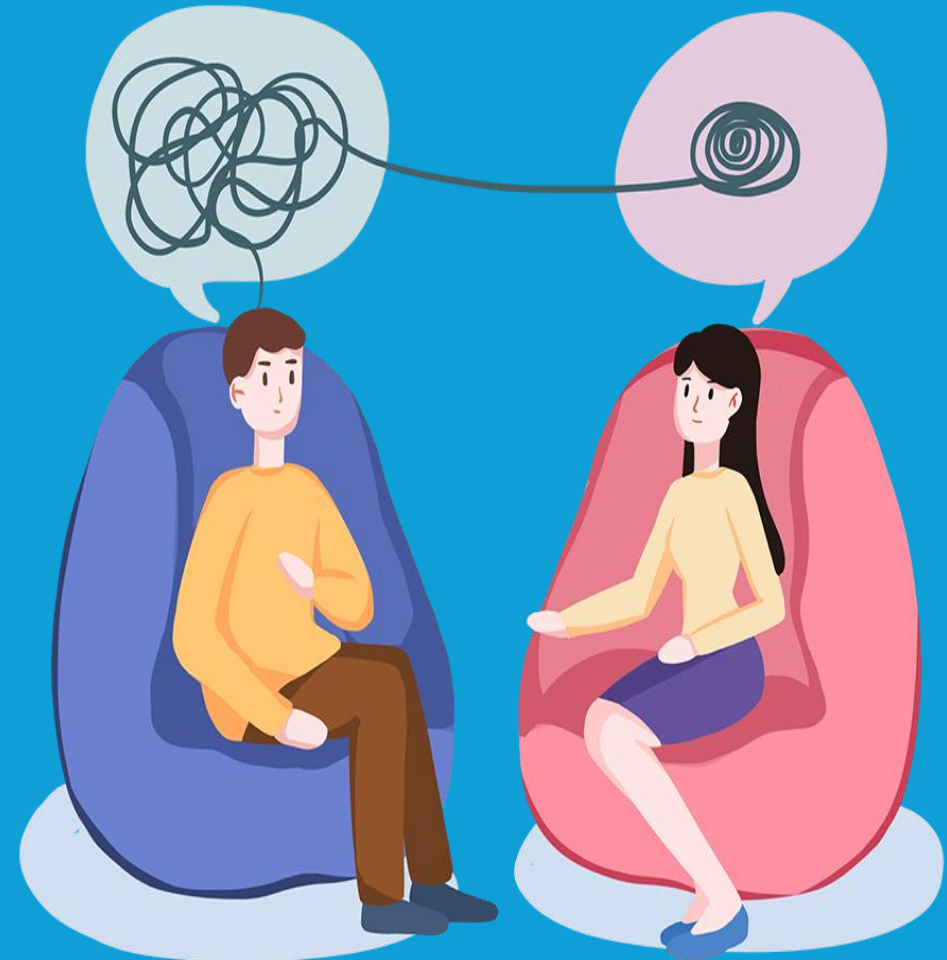


# Know Your Columns

column_name
ID
AGE
GENDER
PANIC_ATTACK_FREQUENCY
DURATION_MINUTES
TRIGGER_REASON
HEART_RATE
SWEATING
SHORTNESS_OF_BREATH
DIZZINESS
CHEST_PAIN
TREMBLING
MEDICAL_HISTORY
MEDICATION
CAFFEINE_INTAKE
EXERCISE_FREQUENCY
SLEEP_HOURS
ALCOHOL_CONSUMPTION
SMOKING
THERAPY
PANIC_SCORE

# Results / Insights

- **Age:** Younger adults show slightly higher average panic scores.
- **Triggers & Symptoms:** PTSD/stress triggers (Higher panic metrics); top cluster = sweating + shortness of breath + dizziness(most frequent).
- **Lifestyle:** low sleep combined with anxiety history associates with higher panic score; consider screening for sleep and caffeine use.



# Age Category vs Panic Severity

*This slide explores how the average panic score varies across different age groups*

```
SELECT
  CASE
    WHEN Age <= 30 THEN '18-30'
    WHEN Age > 30 AND Age <= 50 THEN '31-50'
    ELSE '51+'
  END AS Age_Group,
  AVG(Panic_Score) AS Average_Panic_Score
FROM
  panic_attack_data
GROUP BY
  Age_Group
ORDER BY
  Age_Group;
```

## Output

AGE_GROUP	AVERAGE_PANIC_SCORE
18-30	5.711246
31-50	5.482558
51+	5.56338

# Influence of Medical History and Trigger on Panic

*This section determine how medical history and trigger type influence panic severity and duration*

## Output

MEDICAL_HISTORY	TRIGGER_REASON	CASE_COUNT	AVERAGE_PANIC_SCORE	AVERAGE_DURATION_MINUTES
Anxiety	Caffeine	86	5.360465	24.953488
Anxiety	PTSD	85	5.917647	25.188235
Anxiety	Unknown	84	5.535714	22.97619
Anxiety	Stress	81	5.234568	22.901235
Anxiety	Phobia	80	5.5625	24
Anxiety	Social Anxiety	76	5.644737	24.434211
Depression	Social Anxiety	65	5.661538	26.307692
Depression	Unknown	64	5.03125	23.15625
Depression	Phobia	58	5.931034	24.034483
Depression	Caffeine	57	5.403509	25.491228

```
SELECT
    Medical_History,
    Trigger_reason,
    COUNT(*) AS Case_Count,
    AVG(Panic_Score) AS Average_Panic_Score,
    AVG(Duration_Minutes) AS Average_Duration_Minutes
FROM
    panic_attack_data
GROUP BY
    Medical_History,
    Trigger_reason
ORDER BY
    Case_Count DESC, Average_Panic_Score DESC
LIMIT 10;
```



# Most Common Symptom Clusters

*Identifies the most frequent combination of symptoms that occur together during a panic attack, highlighting key physical indicators*

```
SELECT
  COUNT(*) AS Case_Count,
  Sweating,
  Shortness_of_Breath,
  Dizziness,
  Chest_Pain,
  Trembling
FROM
  panic_attack_data
WHERE
  Sweating = 'Yes' OR
  Shortness_of_Breath = 'Yes' OR
  Dizziness = 'Yes' OR
  Chest_Pain = 'Yes' OR
  Trembling = 'Yes'
GROUP BY
  Sweating,
  Shortness_of_Breath,
  Dizziness,
  Chest_Pain,
  Trembling
ORDER BY
  Case_Count DESC
LIMIT 5;
```

## Output

CASE_COUNT	SWEATING	SHORTNESS_OF_BREATH	DIZZINESS	CHEST_PAIN	TREMBLING
81	TRUE	TRUE	TRUE	FALSE	FALSE
79	TRUE	TRUE	TRUE	FALSE	TRUE
74	TRUE	TRUE	FALSE	FALSE	FALSE
73	TRUE	TRUE	FALSE	FALSE	TRUE
58	TRUE	TRUE	TRUE	TRUE	FALSE

# Panic Score by Sleep Hours & Medical History

*shows the correlation between sleep patterns and panic attack severity, considering how a patient's medical history influences this relationship.*

## Output

MEDICAL_HISTORY	SLEEP_CATEGORY	PATIENT_COUNT	AVERAGE_PANIC_SCORE
Anxiety	Average	218	5.931193
Anxiety	High	86	5.325581
Anxiety	Low	188	5.191489
Depression	Average	146	5.787671
Depression	High	62	5
Depression	Low	141	5.666667
None	Average	51	5.627451
None	High	25	4.56
None	Low	46	5.217391
PTSD	Average	96	6.072917
PTSD	High	42	5.690476
PTSD	Low	99	5.444444

```
SELECT
    Medical_History,
    CASE
        WHEN Sleep_Hours < 6 THEN 'Low'
        WHEN Sleep_Hours >= 6 AND Sleep_Hours <= 8 THEN 'Average'
        ELSE 'High'
    END AS Sleep_Category,
    COUNT(*) AS Patient_Count,
    AVG(Panic_Score) AS Average_Panic_Score
FROM
    panic_attack_data
GROUP BY
    Medical_History,
    Sleep_Category
ORDER BY
    Medical_History, Sleep_Category;
```

# Triggers on Panic Metrics and Heart Rate

*Measure how different trigger types affect panic metrics (score, frequency, duration), as well as the average heart rate during an attack*

```
SELECT
    Trigger_reason,
    AVG(Panic_Score) AS Average_Panic_Score,
    AVG(Panic_Attack_Frequency) AS Average_Panic_Attack_Frequency,
    AVG(Duration_Minutes) AS Average_Duration_Minutes,
    AVG(Heart_Rate) AS Average_Heart_Rate
FROM
    panic_attack_data
GROUP BY
    Trigger_reason
ORDER BY
    Average_Panic_Score DESC;
```

## Output

TRIGGER_REASON	AVERAGE PANIC_SCORE	AVERAGE PANIC ATTACK_FREQUENCY	AVERAGE DURATION_MINUTES	AVERAGE HEART_RATE
Social Anxiety	5.766497	4.411168	24.903553	122.629442
PTSD	5.765854	4.692683	24.790244	120.643902
Stress	5.582888	4.352941	24.213904	118.449198
Phobia	5.551724	4.093596	24.073892	120.167488
Unknown	5.378641	4.412621	23.34466	120.509709
Caffeine	5.376238	4.50495	25.044554	119.326733

# Dashboards

- **Patients by Symptoms:** Counts & top Symptom clusters.
- **Other Requirements:** KPI cards for Panic Score(category), Medical history, Trigger Reason, etc.
- **Age-Group Analysis:** Avg sleep, panic score, and attack frequency by age.



*Number of Patients Having Dizziness As Symptom*



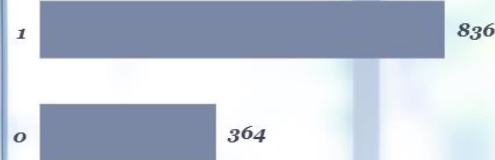
*Number of Patients Having Trembling As Symptom*



*Number of Patients Having Chest Pain As Symptom*



*Number of Patients Having Sweating As Symptom*



*Number of Patients Having Shortness of Breath As Symptom*



Panic Score(Category)

- ☐ High  
☐ Low  
☐ Medium

Gender

- ☐ Female  
☐ Male  
☐ Non-binary

Medical History

- ☐ Anxiety  
☐ Depression  
☐ None  
☐ PTSD

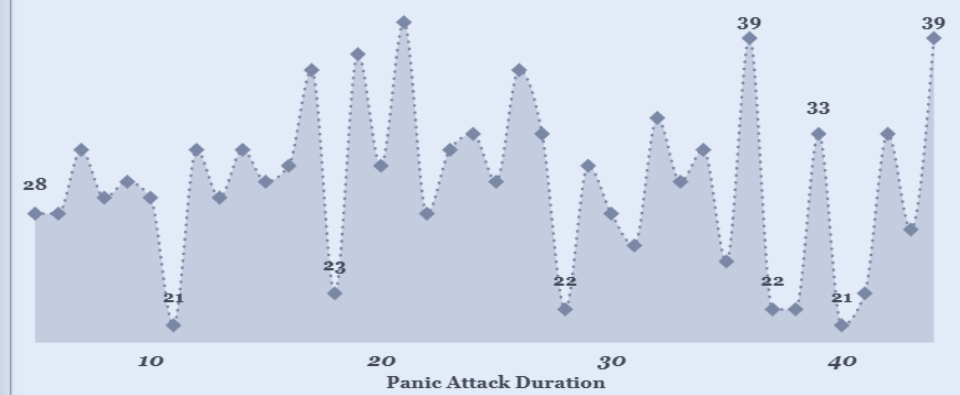
Trigger Reason

- ☐ Caffeine  
☐ Phobia  
☐ PTSD  
☐ Stress

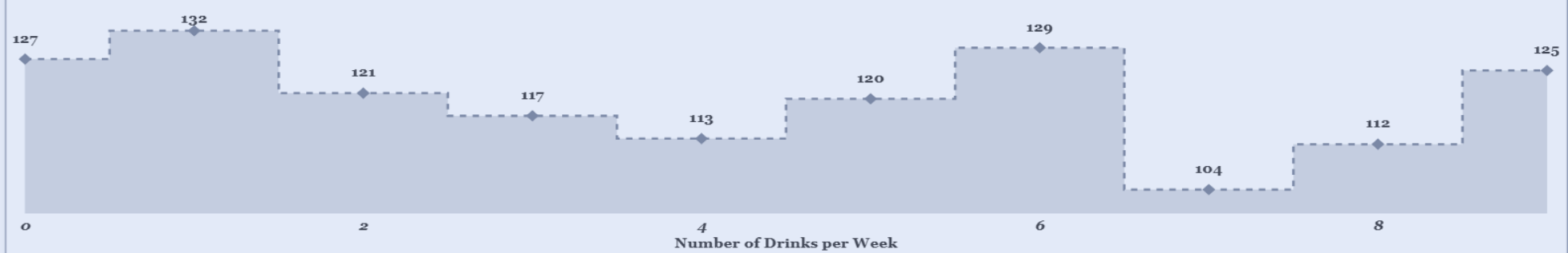
Number of Patients by Sleep Hours



Number of Patients by Panic Attack Duration (Min.)

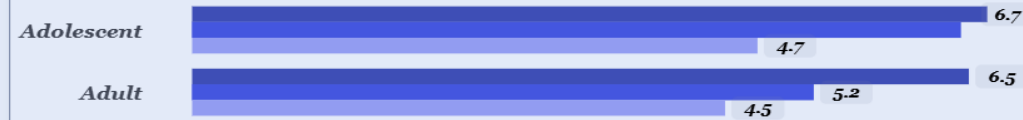


Number of Patients by Drinks per Week

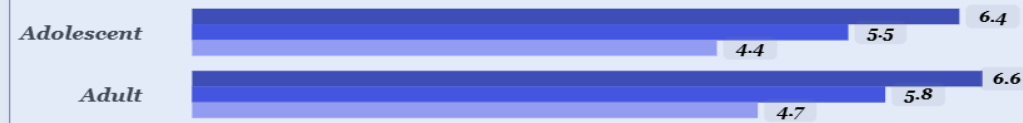


Average of Sleep Hours/ Panic Score/ Panic Attack Frequency by Age Groups

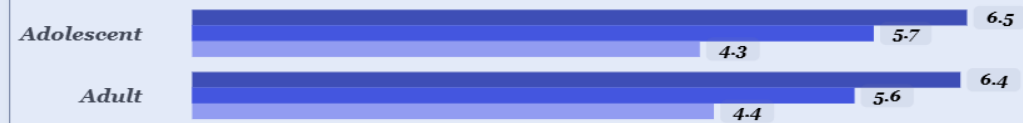
Caffeine



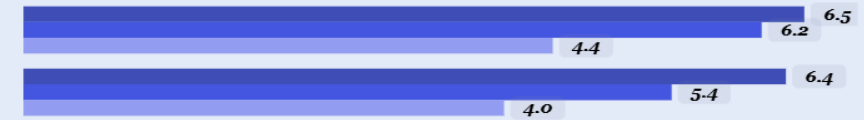
PTSD



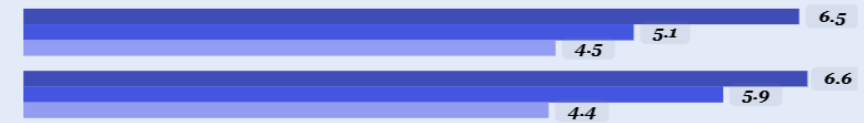
Stress



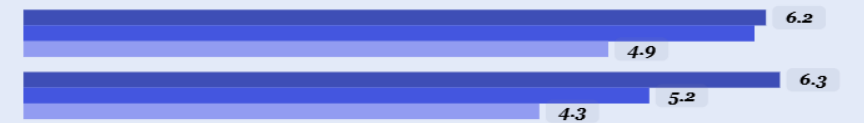
Phobia



Social Anxiety



Unknown



Legends:- ● Average of Sleep Hours ● Average of Panic Score ● Average of Panic Attack Frequency

# Challenges Faced while Making this Project

- **Data cleaning:** inconsistent symptom labels and some categorical noise.
- **Feature engineering:** grouping free-text symptoms into robust clusters.
- **Statistical limits:** small subgroup sizes for some rare triggers.







# Conclusion

- **Key finding:** Specific triggers (PTSD/stress/caffeine), symptom clusters (e.g., sweating + shortness of breath + dizziness), and low sleep consistently associate with higher panic severity and elevated heart rate.
- **Value:** Snowflake + Power BI dashboards make these patterns actionable & useful for targeted intake questions.
- **Next steps:** Increase sample size, implement predictive modeling, & share full SQL scripts & PBIX for reproducibility.