

# What Are People Tweeting About Pain: Implications of Using Social Media to Collect and Deliver Targeted Health Information

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## Background

The word "pain" conjures a different set of associations and memories to different people depending on their past experiences, beliefs, and to whom they are talking to about their pain. Wouldn't it be great to have access to a person's reaction to pain in real time?

**Toothaches** occur in 12.2% of the U.S. adult population (1).

Lower **backaches** affect 18% of people (2).

**Earaches** account for 1.2% of all office visits per year (3).

90% of people have a **headache** at some point in their lives (4).

Twitter provides a novel way to collect data on how these pains are perceived in real time on any given day, which can further our understanding of an individual's perceptions of pain and its impact.

### What is Twitter?

A social media service where users post updates, called tweets, of 140 characters or less.

### Who uses Twitter?

-Mostly 18-44 year olds

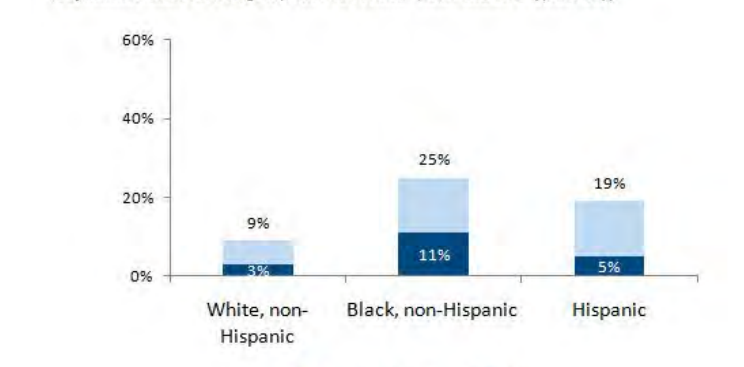
-High proportions of minorities

-College graduates

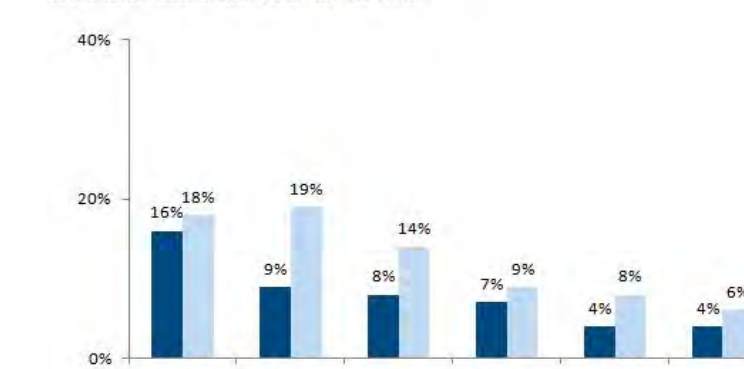
-Both men and women

\*Continuing growth in all populations

African-Americans and Latinos are more likely than whites to use Twitter



Twitter use by 25-44 year olds has grown significantly since late 2010



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## Objective

To examine how Twitter users experiencing toothaches, backaches, earaches, and headaches communicate their symptoms, suffering and actions taken to relieve pain.

## Significance

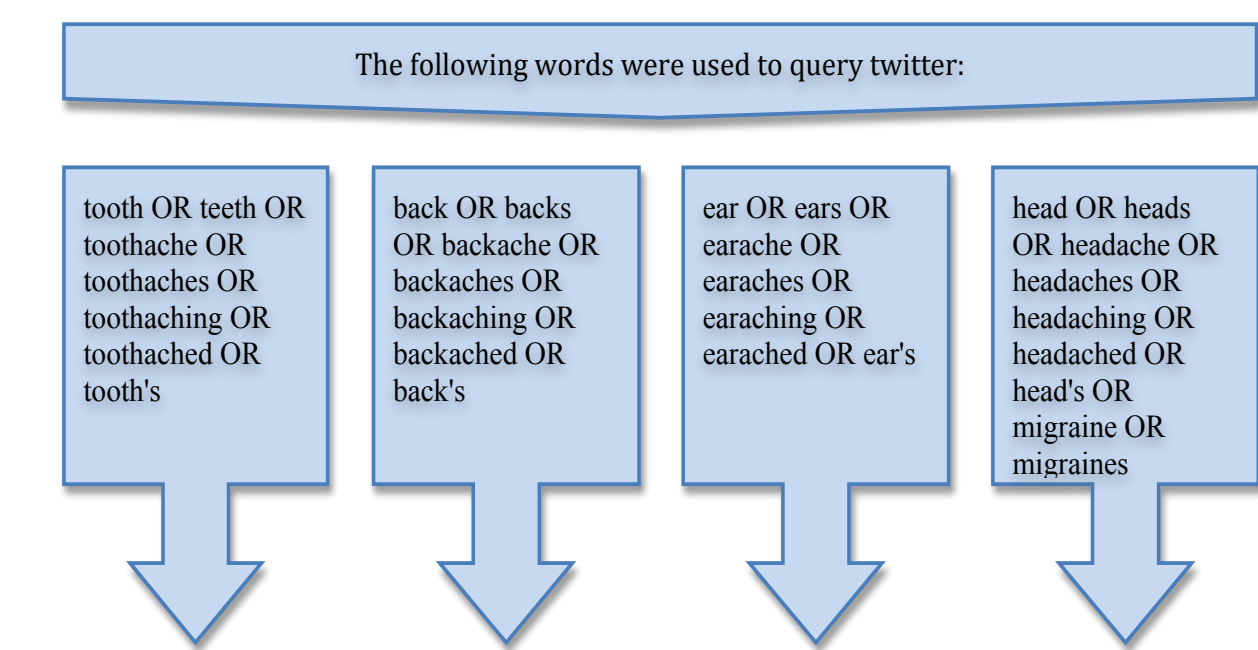
There is a lack of naturalistic, real time, self-reported data on these general pains which affect many people on a daily basis.

This study allows for the establishment of unifying statistics for topics which may not normally be compared.

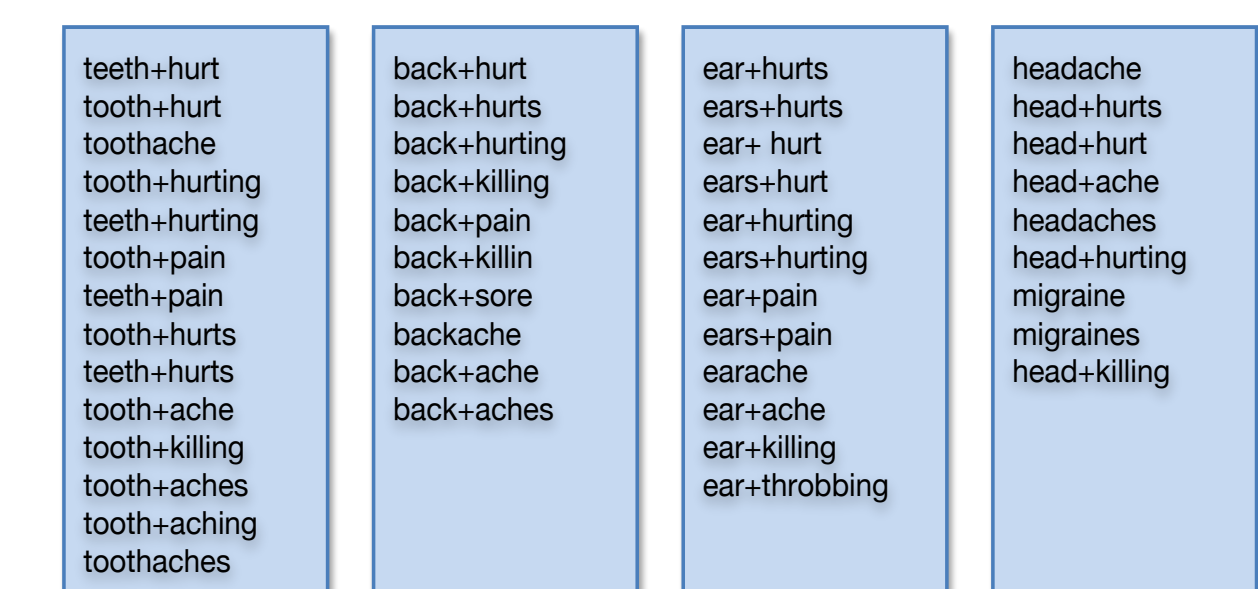
By documenting and comparing differences in pain intensities, causes, and common actions patients associate with different types of pain, health providers can better serve their patients' needs.

## Methods

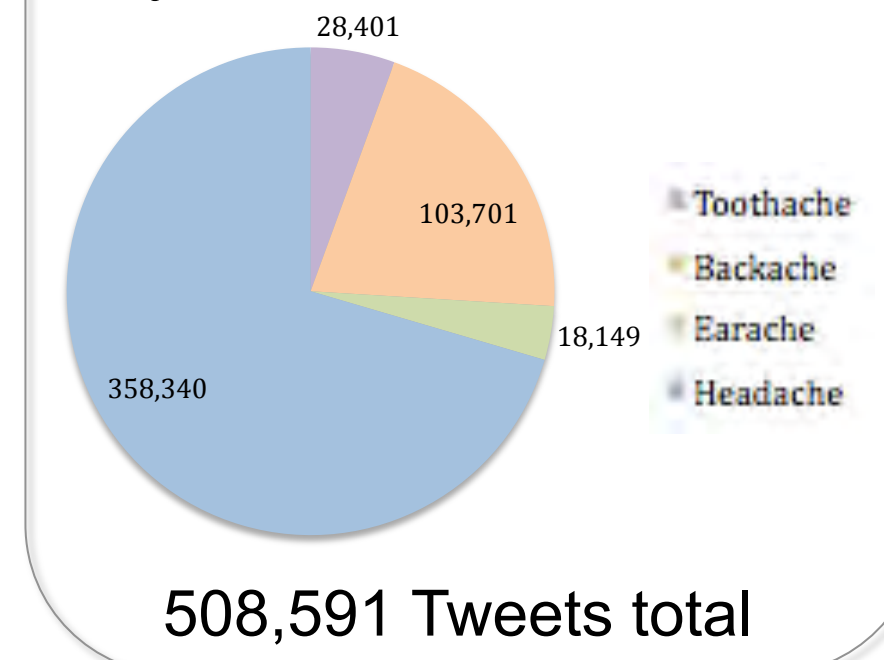
### 1. Search Terms



Results were placed in a word frequency calculator and most frequent words were combined to generate the following query terms:



### 2. Data collection took place over seven non-consecutive days:



### 3. Inclusion Criteria:

- Meets at least one query term
- Relevant to pain
- First person perspective
- Tweet written in English

### 4. Exclusion Criteria:

- Spam
- Re-tweets
- Non-unique users
- Ambiguous/incoherent tweets

### 5. 300 of each pain type were coded

Pain Statement
• my head hurt so badd ...
Action
• My ear is still hurting like crazy. Hopefully those antibiotics start working soon. Hope watching Sox Vs. Cubs will make me feel better hurt!
Status of Relief
• Two antibiotics, orange gel, pain pill, and two advils later.....my toothache has went down
Dentist/Health Provider (Retrospective Opinion)
• Tooth still hurts. If this veneer falls off for a third time I'm changing dentists.
Impact on Daily Activity
• Head Hurt So Bad I Can't Even Go To Sleep .
Cause of Pain
• I slept wrong, my back hurts.
Anxiety
• Im scared of the dentist / #tobehonest ...they always hurt my teeth .
Temporal Aspects of Pain
• My ear hurts again. >{
Co-Morbidities
• My ear has my head hurting my head hurting has caused me to be nauseous! No no no!

Primary categories and sample tweets

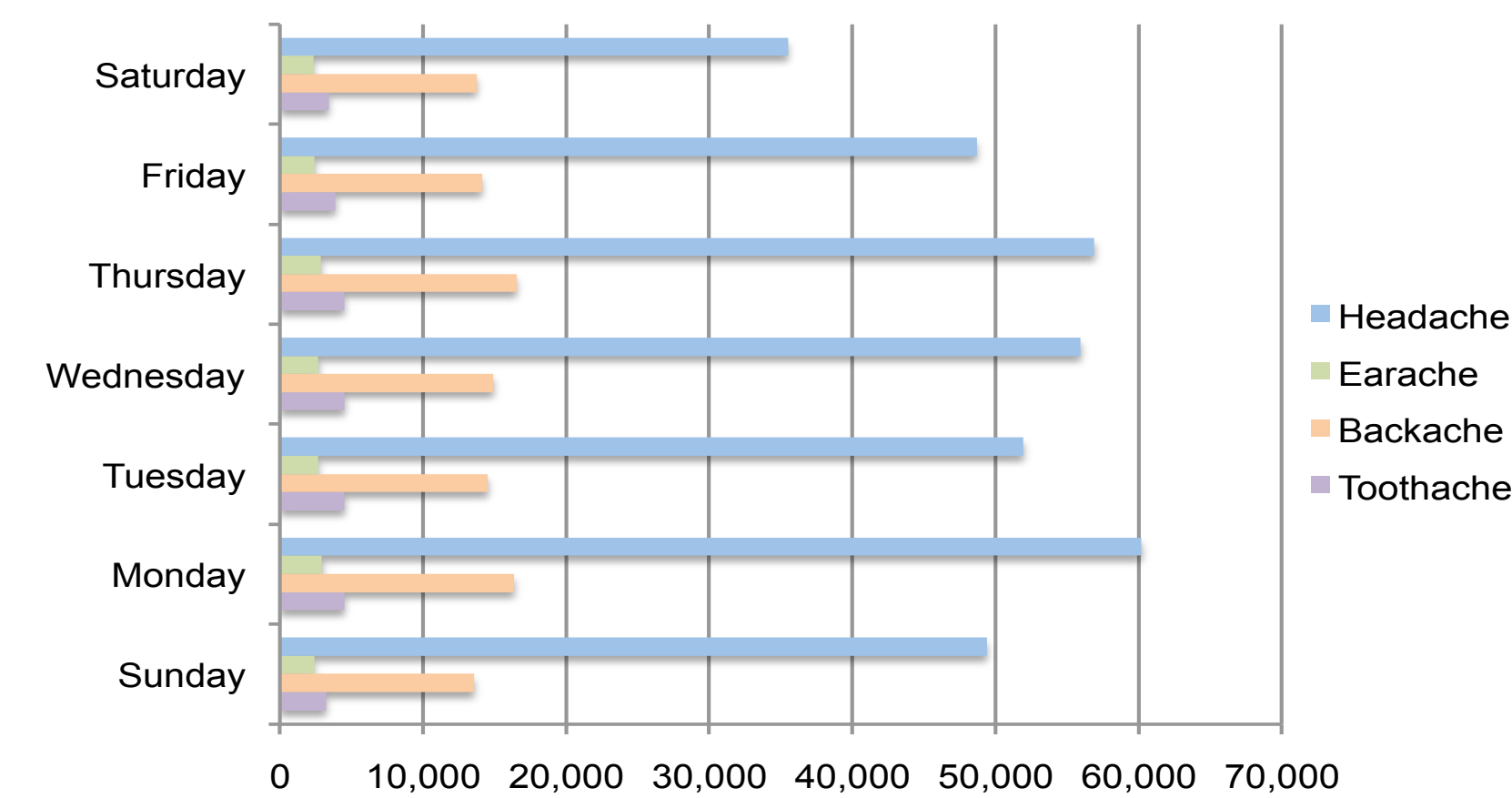
Tweet	Primary Category	Secondary Category
my back is killing me right now... Grrrr thats wat I get.	Statement/ Pain Intensity	Moderate
I have high hopes that four Advil and a martini will appease this devastating toothache	Action	Medication: OTC and Recreational Substance
Couldn't sleep because of my teeth. Ugh, they freaking hurt!	Impact	Lost sleep
I think I pulled a muscle in my back from dance! #pain \	Cause	Physical
I Got a head ache againnnnn	Temporal	Recurrent
- yup, im definitely getting sick. my ears & throat hurt :)	Co-morbid	Cold and Flu

Sample coding of tweets

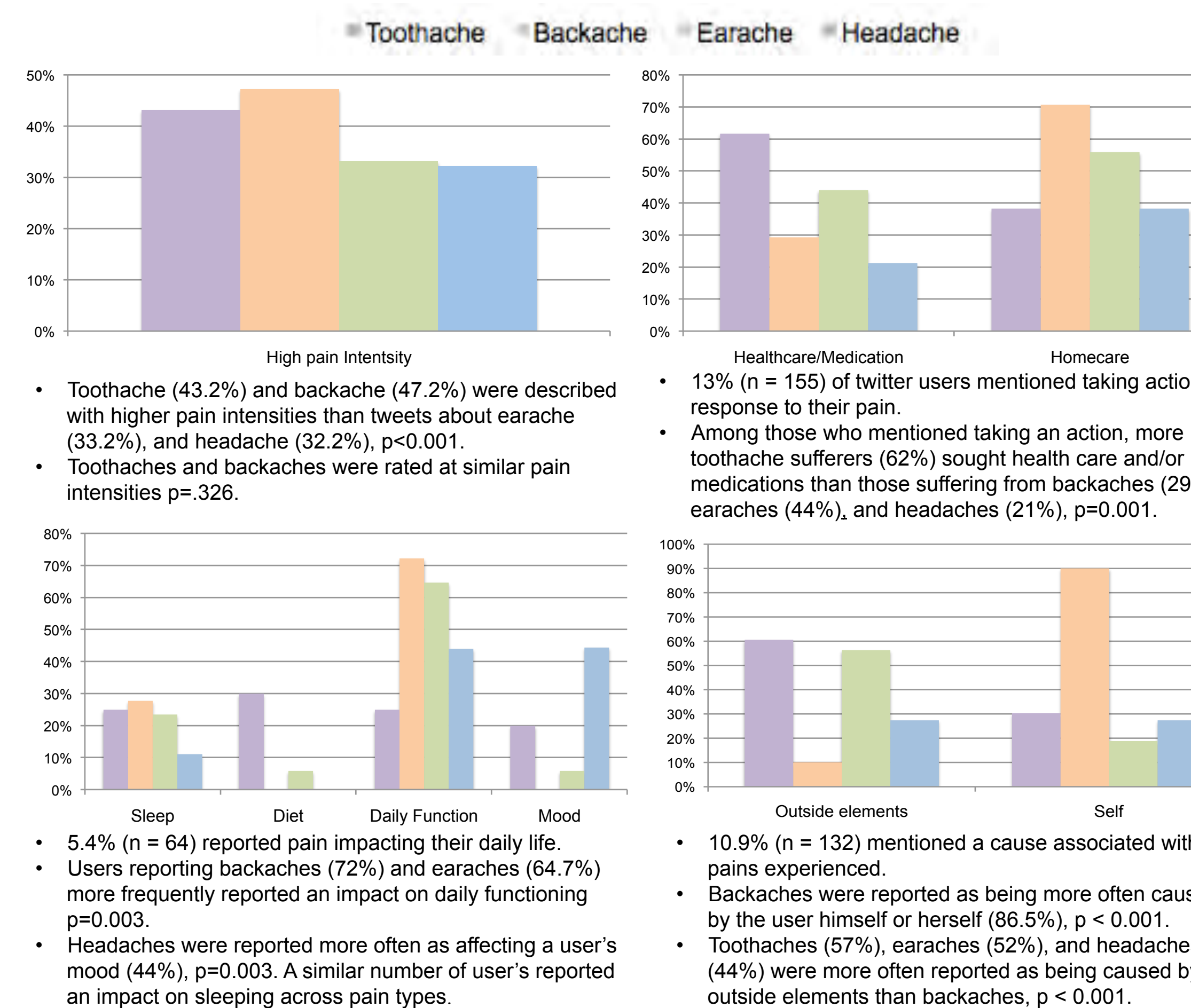
### 6. Inter-rater reliability: Kappa= 0.96 (almost perfect agreement)

7. Descriptive statistics, ANOVA and Pearson chi-square tests were used to compare differences among pain types.

## Results



Summary of tweets pulled by pain type and day of the week.



## Conclusion

People tweet about pain and describe different experiences for different types of pain in terms of pain intensities, health care seeking, impacts and causes.

Twitter is a novel way to collect real time, self-reported data on a variety of topics such as health related information. It provides an advantage over traditional survey research by minimizing recall bias and demand characteristics.

With these data we hope to foster a better understanding of individuals' comparative experiences with pain, leading to innovative ways of using social media to deliver evidence based and individually relevant information to patients.

## Acknowledgements

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## References

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