
Poster

Preliminary Analysis of Worldwide Usage Patterns in a Mobile Palliative Care Reference App

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Abstract

Background: Fast Facts and Concepts for iOS and Android is the world's most downloaded point of care mobile reference application for palliative care providers. This free mobile app leverages the Fast Facts and Concepts article repository that was started in 1999 at the End-of-Life/Palliative Education Resource Center at the Medical College of Wisconsin. Our team released the initial iOS version of the app in summer of 2014. Since then, it has been downloaded over 13,000 times.

Objective: The purpose of this project is to evaluate and describe user behaviors of palliative care clinicians on a global scale using an analytics layer integrated into Fast Facts and Concepts.

Methods: An analytics layer was integrated and disclosed with version 1.0.3; an analytics event is triggered when an article is read or when a search is made. The event, along with anonymous user metadata, was sent to a Web server where it was segmented. Summary statistics were generated using Python scripts and include category weight, article rank, and search term clusters. We evaluated user behavior of the Fast Facts and Concepts app during a 3-month window to better understand the needs of the userbase.

Results: Our dataset had 26,733 events and 1461 unique users from 41 countries collected over 3 months. Prognosis was the most active category, with searches for Palliative Performance Scale accounting for a third of prognosis reads. Articles about dosage featured heavily, especially on methadone titration. On the spectrum of illness, physiological categories such as gastrointestinal and renal diseases were generally more popular than psychiatric disorders. Articles about interpersonal skills from categories such as Communication; Ethics, Law, Policy; and Psychosocial and Spiritual Experience were the least read. All of our conclusions are supported by chi-squared tests with P values <.01. More detailed results are included in the poster.

Conclusions: This analysis shows that most users consult the app for guidance in symptom management and prognosis. The usage patterns described above suggest that the app is likely being used at the point of care as a clinical reference for medical decision making and therapeutic guidance. Our study provides evidence that mobile applications can be effective tools to distribute quality palliative care resources on a global scale. Our results also indicate which topics should be emphasized in medical education and how increased vigilance about these topics can optimize patient care; with a large active user base, we have the opportunity to make even more precise conclusions in the future.


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KEYWORDS

palliative care; mHealth; hospice

This poster was presented at the Connected Health Symposium 2016, October 20-21, Boston, MA, United States. The poster is displayed as an image in [Figure 1](#) and as a PDF in [Multimedia Appendix 1](#).

Figure 1. Poster.




BROWN

Preliminary Analysis of Worldwide Usage Patterns in a Mobile Palliative Care Reference App

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BRIGHAM AND WOMEN'S HOSPITAL

Abstract

Our team created Fast Facts for iOS and Android, a mobile reference app for palliative care providers with peer-reviewed articles written by subject experts. Our experience with this project demonstrates that mobile applications can be used to augment clinical decision-making and generate insights about palliative care practice at a systemic level.

There is a demand for mobile applications: over the course of the past year, Fast Facts has been downloaded over 16,000 times in eighty-eight different countries, across a range of Apple and Android devices. Beyond broad demographics, we also collected more granular usage data. Our dataset has about 800,000 app events from 5,500 users collected since October 2015.

By analyzing the articles users read, we identified the most popular articles as well as the most popular categories, which correspond to the most important knowledge areas. Articles readily applicable in a clinical setting were most popular, such as on methadone dosage or the Palliative Performance Scale. On the spectrum of illness, readily applicable categories such as prognosis or physiological topics such as GI and renal diseases were generally more popular than psychiatric disorders. Articles about interpersonal skills from categories such as Communication; Ethics, Law, Policy, and Psychosocial and Spiritual Experience were generally less popular.

This analysis shows that most users consult the app for guidance in symptom management and prognosis. The usage patterns described above suggest that the app is likely being used in the field as a clinical reference for medical decision-making and therapeutic guidance. Our study provides evidence that mobile applications can be effective tools to distribute palliative care resources on a global scale. In addition, frequent search terms from the applications can be utilized to inform future Fast Fact article curation to better service the end user's needs.

Results

Total Downloads: 16,000
Active Users: 5,500
iOS: 4,500
Android: 1,000
Countries: 88
Articles read: 800,000
Most Popular Countries: US, Canada, UK

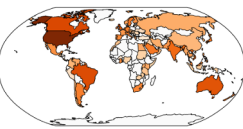


Figure 1. Approximate user metrics from 4/14-9/16

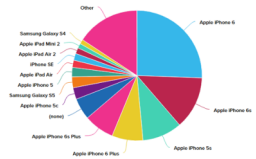


Figure 3. Device type distribution

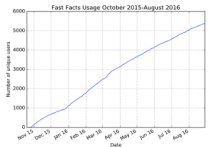


Figure 4. Number of active users from analytics layer

Categories Ranked by Importance

Category	Weight	Category	Weight
Prognosis	0.902	ICU, Critical Care	0.456
Neurologic Disorders - Dementia	0.849	Psychosocial and Spiritual Experience	0.450
Non-Pain Symptoms and Syndromes	0.822	Chronic Pulmonary Diseases	0.443
GI Diseases and Nutrition	0.773	Communication	0.424
Pain: Opioids	0.665	Cardiac Diseases/Heart Failure	0.421
Renal Diseases, Dialysis	0.554	Neurologic Illnesses	0.409
Cancer	0.534	Ethics, Law, Policy	0.405
Psychiatric Disorders	0.505	Pain: Evaluation	0.378
Neurologic Disorders - ALS	0.504	Other	0.324
Pain: Non-opioids	0.500	Pain: Substance Abuse	0.309

Most Read Articles

Article Name	Article Score
1. Methadone For The Treatment of Pain	159.2
2. The Palliative Performance Scale (PPS)	155.6
3. Prognostication in Dementia	143.2
4. Dyspnea at End-Of-Life	137.1
5. Medical Management of Bowel Obstructions	119.4

Most Searched Terms

Search Term	Num Searches	Search Term	Num Searches
1. Nausea	1746	6. Dyspnea	664
2. Methadone	1494	7. PPS	662
3. Pain	864	8. Opioid	584
4. Cough	748	9. ALS	540
5. Delirium	718	10. Bowel	516

Introduction



In 2013, an ePocrates Mobile Trend Report predicted that, in the coming year, nine out of ten healthcare providers will use smartphones. Of these, 85% will use their smartphones for search or reference in relation to their jobs¹.

Both the Google Play and Apple App Stores have limited palliative care specific applications. As of January 2015, searches for keywords "palliative care" in the Apple App Store yield 42 free and paid applications.

We addressed this issue by developing and releasing both iOS and Android versions of the Fast Facts and Concepts database. This iOS version was released in April of 2014. The Android version was released February 2016.


The Fast Facts and Concepts database consists of peer-reviewed and evidence based monographs on various palliative care topics².

Download Fast Facts now!

Methods and Design

As a reference application, Fast Facts was designed to make information from 300+ articles easily accessible: a search feature looks across all articles and returns the most relevant articles, while articles are also indexed by categories. For the sake of reusability, users can bookmark articles and share with others.



Amplitude server

Conclusions

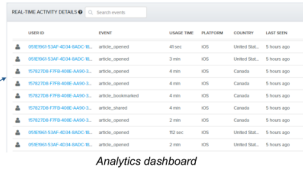
The most utilized articles and categories that frequent users of the application access are about prognosis and therapies aimed towards common symptoms in Palliative Care such as nausea and pain.

Methadone is the only drug specific term that is frequently searched and the only disease specific term that is frequently searched is ALS (amyotrophic lateral sclerosis).

One goal of implementing an analytics layer to Fast Facts for iOS and Android was to utilize the usage patterns from the application to inform future article curation in the Fast Facts database.

Given the frequency of searches specifically for methadone and ALS, our study suggests that more articles discussing these topics would likely be beneficial to the user base.

Our study also provides evidence that mobile applications can be effective tools to distribute palliative care resources on a global scale.



Analytics dashboard

Figure 5. Analytics pipeline.

To determine what knowledge areas are most important, we ranked categories by the total number of reads they received, normalized to 1. As part of the preprocessing of the dataset, we only utilized data from frequent users which we defined as users who accessed more than 10 articles. Further analysis was performed on most frequent articles read and most commonly searched for terms.

Multimedia Appendix 1

Poster.

[\[PDF File \(Adobe PDF File\), 1MB-Multimedia Appendix 1\]](#)

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