Managing Binge Eating Disorder with iTakeControl

A Case Study in mHealth and Disease Management

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Mobile health applications are still in their infancy, but present a great opportunity for the healthcare industry. They enable patients to have a greater role in their health, empower providers to make data-driven decisions, allow researchers to gain greater insight into patient and disease populations, and give payers a new window into how patients are doing on treatment. With a multitude of conditions and disorders that require consistent support from medical professionals, not all patients can easily provide data or have access to the resources they need. In this paper, we explore how a mobile application can help bridge this gap by reviewing data obtained through iTakeControl Binge, a mobile health application focused on Binge Eating Disorder.

Eating disorders (ED), are prevalent; however, only 17-23% of these individuals receive treatment for it (1), leaving others to struggle with their disorder without professional help. While direct treatment with a healthcare professional is the best course for patients with an eating disorder, access to resources and tools that can aid in the management of a disorder can benefit patients who would otherwise go untreated.

There are several different types of eating disorders, including but not limited to Anorexia, Bulimia, and Binge Eating. Each eating disorder is characterized by different symptoms and requires a different management plan. Binge Eating Disorder (BED) is the most prevalent eating disorder with a rate of 1.9%, affecting approximately 105 million people globally (2); it is characterized by frequent episodes of overeating accompanied by feelings of loss of control. One of the most effective treatments for BED is cognitive behavioral therapy (CBT). A study looking to evaluate the effectiveness of patients with BED recently found that a few formats of CBT, including guided self-help, “were superior to placebo in achieving abstinence and reducing binge frequency.” (3)

iTakeControl Binge is a mobile application designed to provide a comprehensive disease management tool that delivers a guided program based on CBT, along with other critical support tools in the palm of the patient’s hands. The app includes resources and content to support them in the management of their condition at times when they are seeking support. iTakeControl Binge is available on both iPhone and Android mobile devices. However this paper is focused exclusively on data from iPhone users.
iTakeControl User Demographics

Geographic Demographics

iTakeControl Binge was made available through the Apple app store, where users were able to access the application globally free of charge. Any individual with an iPhone device is able to use the mobile application. As one of the top 5 search results in the app store for “Binge eating,” the majority of users are assumed to have found the application via direct search and have proceeded to download and register in the app. Understanding the global availability of the app, we can examine its usage as one data set for a real-world view of the demographics of this specific patient population.

Currently, iTakeControl Binge is only available in English. Hence, we would expect the majority of users to come from English speaking countries. In analyzing the user community to date for iTakeControl Binge, we see that a large portion of users are primarily from the United States, United Kingdom, Australia, and Canada. However, more surprisingly, we found a significant number of users located in Italy, even though the application is not yet available in Italian. While we can not draw any concrete conclusions from this data, we can certainly generate a few insights that can help inform the healthcare industry about the global demographics of this disease population.

Furthermore, iTakeControl Binge can inform disease demographics at a more regional level. Taking a focused view of the demographics within the US, we see that the majority of users from the

<table>
<thead>
<tr>
<th>Country</th>
<th>% of Users</th>
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<tbody>
<tr>
<td>United States</td>
<td>44%</td>
</tr>
<tr>
<td>Italy</td>
<td>15%</td>
</tr>
<tr>
<td>United Kingdom</td>
<td>14%</td>
</tr>
<tr>
<td>Australia</td>
<td>5%</td>
</tr>
<tr>
<td>Canada</td>
<td>5%</td>
</tr>
</tbody>
</table>
United States are primarily concentrated in the East and West coast, with other large cities such as Chicago, Houston, and Minneapolis also presenting some fairly large user groups.

Gender and Age Demographics

In addition to the geographic data, basic demographics provided paint a better picture of the users of the application. Women represented the majority (95%) of iTakeControl Binge users.

From an age perspective, approximately 74% of iTakeControl Binge users are below the age of 35. Nineteen was the age with the highest number of users, representing 11% of iTakeControl Binge users.
Comprehensive Support and Areas of Interest

iTakeControl Binge provides a comprehensive Binge Eating Disorder Management program, including 12 key features:

- **Learning** – content providing a step by step program to manage BED
- **Coping** – Content with strategies for managing BED
- **Data Entry** – Ability to record data including; binges, exercise, weight, meals, and emotions
- **Goals** – create and assign goals
- **Tools** – enter and manage text entries, including triggers and activities
- **Progress** – track progress of data entered in Data Entry
- **Social feed** – read and comment on posts from other users
- **Journal** – write/ record personal or social journal entries
- **Profile** – manage individual alias, password, and permissions
- **Motivators** – manage motivating images in the application
- **Points** – track your progress in using the application
- **Videos** – watch videos developed by experts in BED

In an analysis of the usage of the app, sections visited by users were further examined to understand the content and tools that Binge Eating patients visited most frequently. Data indicates that users spent the most amount of time in the learning and coping sections of the mobile app, which provided the content on BED and strategies to manage it. The average amount of time spent per session on the application was over 7 minutes among all users and a little over 6 minutes among returning users.

Data Monitoring & Binge Behavior

There is a lot of data and information that is tracked within iTakeControl Binge.

One of the key metrics that iTakeControl tracks is a user-reported “binge” event. Users have the ability to indicate whether they “yes” had a binge today or “No” they did not Binge. Users are encouraged to make a report every day, but are not required to do so. Analysis of the overall binge events reported among all users indicated that, they binge approximately 35% of total reports. A second key data element we collect is the “urge to binge.” This field is an option for any user submitting a binge...
event. When we did a deeper dive on the Urge to binge within the 35% of binge events reported, we see a clear trend, the proportion of bingeing increased based on the urge to binge, with only 9% of users bingeing when their urge was zero, but 75% of users reporting a binge when they had an urge of 5.

![Graph showing % Users who Binged vs. Urge](image)

**Does self-guided CBT learning help?**

In an effort to do an exploratory analysis of how the bingeing behavior differed among users, we analyzed whether or not there is a correlation on binge events or urge from the application’s learning program. The program built into iTakeControl is designed on a step by step basis, requiring users to complete one section, before moving to the next one. The program guides users through a 16 step program that is split across 5 program stages. As users progress and unlock sections of the program, they are instructed to monitor their activities in the application through the Data Entry section.

Users are able to progress through the program at their own pace and over 50% of them have made it through the first four steps of the program, with approximately 15% completing the program.

To compare and further understand the potential impact of following a program and utilizing the features of the app, we decided to divide all users who entered their binge behaviors into 3 groups based on their engagement with the application:

1) **General**: a group consisting of users who made entries but never completed the learning program

2) **Dedicated**: a group of users who completed the entire learning program

3) **Highly Dedicated**: a final group who completed the entire learning program and maintained a higher level of engagement (accessing content, entering data, making journal entries, etc.)

Examining the binge behavior among these groups, we found that there is a potential signal of improvement in the percentage of users who binged from one group to another. "General" users who did not complete the program had the highest percentage of binges among the three groups at 36%. “Dedicated” users had a lower percentage of binges than the “General” group at 31%, while “Highly Dedicated” users had the lowest percentage of binges than the other two groups at 20%. So while we did observe a decrease in bingeing between “General” and “Dedicated” users, the data suggests that greater engagement within the application has the potential to contribute to a lower incidence of binges.

![Graph showing % Users who Binged by Group](image)
“Hello! This app is helping me so much”
“I’ve just joined, feeling determined to beat the urge”
“Got very emotional today and binged”
“i feel good today, didn’t binge”
“Def need support to stay on track”
“I’m seeing a professional but I also need support from and to offer support to those who are fighting the same battle”

Figure 9: iTakeControl Binge Social Posts.

Social Support

In addition to learning and monitoring their progress, users were also provided with an opt-in social support system within the iTakeControl application. As an independent social feed network for users of iTakeControl Binge Only, several users have taken the opportunity to share comments, anecdotes, and support to one another through the feed. Users can post with their personalized Alias to other members of the community.

The posts may provide support to other users, and narrative insight into the main challenges of those who suffer from BED. Direct engagement with other users or just an analysis of discussions can provide a greater understanding of the challenges with BED. We created a word cloud to capture the major themes in the social conversations. While “binge” was the primary theme, other words also stood out, and will lead to the need for further exploration into the nature, patterns, and observations users contribute.

Conclusion

As mobile devices have gained traction and new use cases continue to present themselves, there is significant opportunity to use the medium for further exploration and data collection.

iTakeControl Binge is providing a platform with tools to assist those suffering from BED. With a self-guided program based on CBT, users have the ability to follow a program at their own pace, track their progress, and engage with other users.

We will continue to analyze the data in order to further explore the benefits of utilizing the application for the management of binge eating. We look forward to continuing the exploration of these and other questions in order to understand if cognitive behavior therapy and individual engagement through a mobile application can help users manage their disorder.


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Dalia has a doctorate degree in Biomedical Science and over 20 years of Industry experience in entrepreneurship and management consulting, including leading strategy roles with PA Consulting, IBM and Shire. Dalia has successfully delivered over 40+ engagements across 20+ accounts in the pharmaceutical, medical device and healthcare industries. Prior to founding iTakeControl, Dalia has helped various life science clients implement leading digital and advanced analytics capabilities.

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Nic has a background in biological anthropology with over seven years of experience in quantitative data analysis, consumer insights, and product management. Before joining iTakeControl, Nic worked in market research with a focus on the mobile industry, supporting companies in understanding mobile trends and conducting research using mobile devices.
The more you track, the better you understand yourself.