

A Survey of Notification Designs in Commercial mHealth Apps

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Motivation

- Mobile health (mHealth) app notifications help users achieve their health goals [1,2].
- However, few mHealth apps are grounded in advised health behavior theories or properly evaluated [3].
- We wanted to examine if there was a gap between existing notification design recommendations and practice for mHealth app notifications.

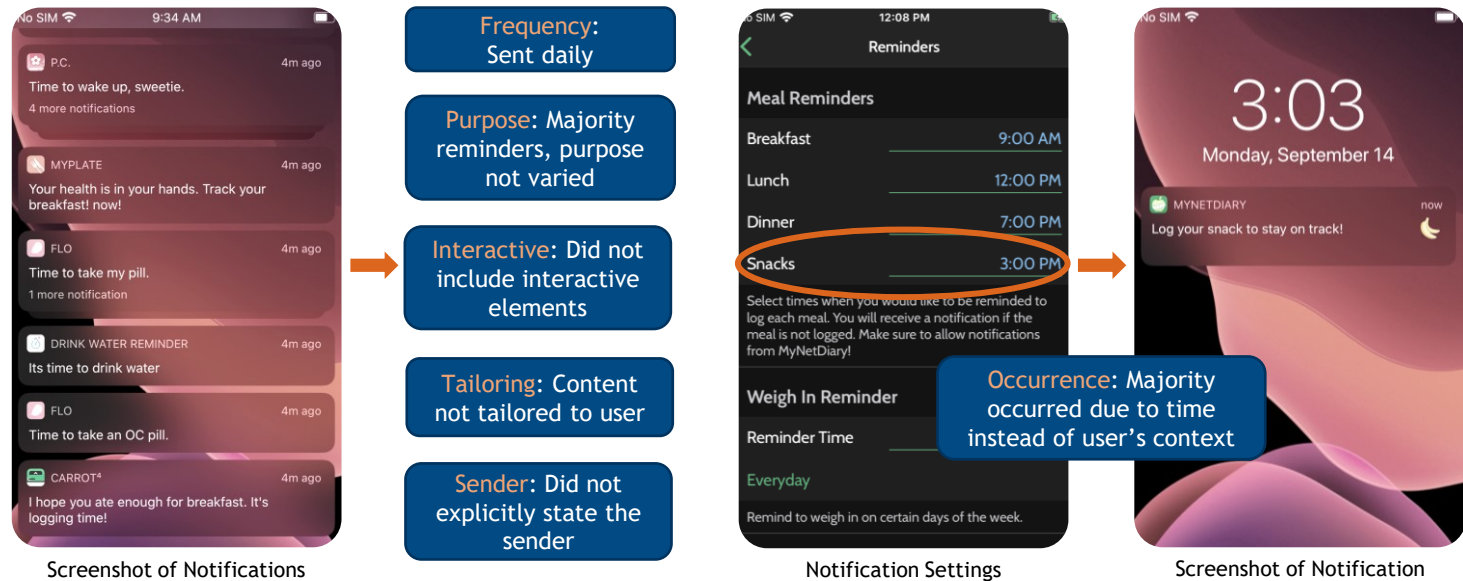
Method

- Two researchers downloaded and interacted with 50 mHealth apps for 5 days.
- Accumulated a total of 1,390 notifications.
- Transcribed and qualitatively coded each notification based on 13 different dimensions.

Dimensions	Individual Codes
Occurrence (Trigger)	Occurred due to user's context, data, app interaction, or time
Frequency	Daily, weekly, monthly, once
Notification Type	Push notification or inside app
Content Type	Statement, question, etc.
Content Purpose	Remind, motivate, tips, etc.
Goal Type	Short-term or long-term goals
Interactivity	Link, requires response, etc.
Tailoring	Containing user's name, data, characteristics, etc.
Aesthetics	Emojis, different fonts, etc.
Sender	Listed notification sender
Settings	Included notification settings
Customizable	Modify amount, time, etc.
Creating Notifications	App has default notifications or had to manually set

Findings

- Found a disconnect between current practice in mHealth app notifications and recommendations in several areas: Occurrence, Frequency, Content Purpose, Interactivity, Tailoring, and Sender.



Open Research Questions for mHealth Apps

- **Occurrence:** What contextual triggers would be effective in increasing engagement and adherence in mHealth apps?
- **Frequency:** How often should notifications be sent to keep users engaged in mHealth? Does it differ based on app theme?
- **Interactivity:** What interactive elements help the most with mHealth app engagement?
- **Notification Type:** Does push or inside app notifications aid in behavioral change?
- **Goal Type:** How do short-term or long-term goal notifications affect behavioral change?
- **Creating Notifications:** How does using default or manual notifications affect mHealth app engagement?

Acknowledgments

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[1] Bidargaddi et al. 2018. To Prompt or Not to Prompt? A Microrandomized Trial of Time-Varying Push Notifications to Increase Proximal Engagement With a Mobile Health App. JMIR mHealth and uHealth 6, 11 (Nov 2018), e10123. <https://doi.org/10.2196/10123>

[2] Gravenhorst et al. 2015. Mobile Phones as Medical Devices in Mental Disorder Treatment: An Overview. Personal and Ubiquitous Computing 19, 2 (Sep 2015), 335-353. <https://doi.org/10.1007/s00779-014-0829-5>

[3] Whittaker. 2012. Issues in mHealth: Findings from Key Informant Interviews. Journal of Medical Internet Research 14, 5 (Oct 2012), e129. <https://doi.org/10.2196/jmir.1989>