

A call for responsible innovation in mobile mental health: Findings from a content analysis and ethical review of the depression app marketplace

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Abstract. Mobile mental health presents many ethical challenges in the wild. These ethical issues and associated values were explored through a content analysis and ethical review of the depression app marketplace. App search and data collection was performed in Google Play Store (UK) and Apple iTunes (UK) between October to November 2018. Iterative data extraction and coding of ethical variables and values were conducted prior to synthesis of issues and themes. Search found 353 unique apps for depression. Analysis uncovered a range of ethical issues including: limited evidence of intervention validity, fidelity, and outcomes; insufficient safeguarding and duty of care; non-multisector development teams; lack of independent certification and regulation; lack of information and transparency for informed user choices; and concerns with privacy, confidentiality, and user permissions. These findings highlighted the presence and absence of ethical values in apps for depression, with most apps failing to reflect many key values. Our findings suggest a need for greater ethical value sensitive design in mobile mental health. This is challenging given the field's multidisciplinary and value conflicts. We encourage designers to adopt a responsible innovation approach to creating technologies that meet these ethical demands.

Keywords. Mobile mental health, applications, depression, ethics, value sensitive design, responsible innovation, content analysis

1. Introduction

Mobile mental health has been lauded for its potential to remove barriers and increase access to care. Yet, many ethical concerns have been raised most commonly related to privacy and security, risks and safety, and benefits and evidence [1-9]. Examples of these issues were evident in content analyses and marketplace reviews of publicly available mental health applications, with apps for depression found to lack research evidence and information provided to potential users regarding the app, safety, and privacy [10-19].

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Our research built on previous reviews and analyses to consider the ethical values and issues in mobile mental health with the aim of exploring solutions for greater ethical design and practice. Guided by principlism, professional ethics, and value sensitive design, we conducted a content analysis of the depression app marketplace to determine: (1) What ethical issues were evident in the depression app marketplace? and (2) How do these issues reflect ethical values in app design, development, and marketing?

2. Method

App search and data collection was conducted between October to November 2018. Search was performed in Google Play Store (UK) and Apple iTunes (UK) for apps for depression according to the stipulated inclusion/exclusion criteria. Coding was done iteratively using a list of variables compiled prior to review and developed throughout as ethical issues emerged. Data was synthesized through group deliberation with all authors exploring how the identified ethical issues fit existing principles and values.

3. Results

Search found 353 unique apps for depression. Analysis of these apps uncovered a range of ethical issues including: limited evidence of intervention validity, fidelity, and outcomes; insufficient safeguarding and duty of care; non-multisector development teams; lack of independent certification and regulation; lack of information and transparency for informed user choices; and concerns with privacy, confidentiality, and user permissions. Moreover, our analysis showed these issues to be complex, intertwined, and interrelated. These findings highlighted the presence and absence of ethical values in the design, development, and marketing of publicly available apps for depression, namely values of: (Beneficence) benefits, risk minimization; (Nonmaleficence) avoidance of harm, safety and welfare; (Duty) competence, responsibility, standards; (Integrity) transparency, credibility; (Autonomy) informed choice, privacy and confidentiality; (Justice) accessibility, fairness. Most apps for depression and the depression app marketplace failed to reflect many of these ethical values.

4. Conclusion

Our analysis of the depression app marketplace reflected the complexity of ethical mobile mental health in the wild. Findings suggest an urgent need for greater ethical value sensitive design in mobile mental health and consideration of potential ethical dilemmas throughout the lifespan of mental health technologies. This is particularly challenging in mobile mental health given its multidisciplinary approach and the range of associated values. This research uniquely captures the complex ethical and value conflicts in mobile mental health in the wild, through the example of the depression app marketplace. When faced with moral overload, designers may prioritize some values over others, such as a focus on increasing accessibility at the expense of safety. We conclude by encouraging a responsible innovation approach to the design of new technologies and demonstrate how this will better meet ethical demands and practice.

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