A Study Examining How AI-Driven mHealth Applications Communicate Ethical Responsibilities To Patients

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Background

Mobile health (**mHealth**), when combined with AI, has the potential to greatly impact the healthcare space. However, there is a need for attention on how mHealth influences the physician-patient relationship, and how balance can be maintained between data access and the ethical issues arising from the use of mHealth. This thesis investigates how a user manual and privacy policy of an mHealth app communicate ethical responsibilities to patients, by conducting **qualitative content analysis**.

Method

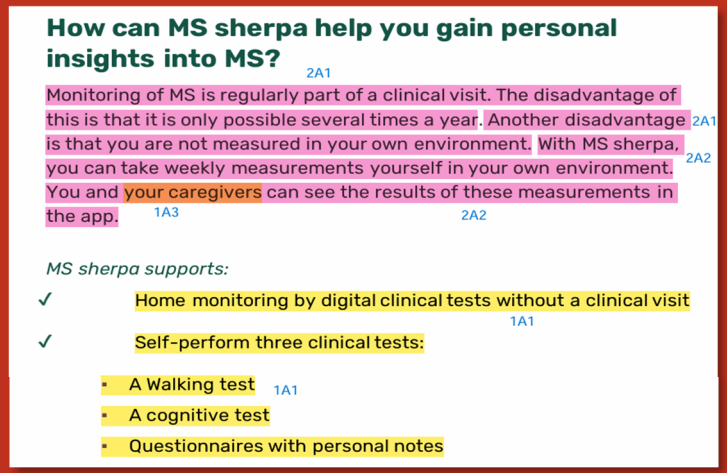
The **user manual and privacy statement** of "MS Sherpa", an app tracking user data of patients with MS, is analysed in the following overarching steps:

- The texts are segmented into different categories to get an overview of the substance.
- The texts are analyzed again while taking into account the EU's **Ethical Guidelines for Trustworthy AI** (EGTAI) as a theoretical framework [1]. The original categories are matched with the corresponging themes of the ethical framework.
- These two analyses are used to form a **coding scheme** (figure 1), which is used to code all the text segments with a specific code (figure 2).

After several rounds of coding and correcting the scheme, the code frequencies and context of the codes applied are used to evaluate which **ethical issues** the user manual and privacy statement adequately address, and which they do not.

Code	Sub-category	Category	Theme
1A1	App explanation	1B. App Introduction	Accountability
1A2	App goal		
1A3	Physician involvement		
1A4	Participating hospital		
1A5	Participating clinical trial		
1A6	Contact information		
1A7	Clinical validation		
2A1	Disadvantages to regular treatment	2B. Empowered Health Perspective	Human agency and oversight
2A2	Advantages app use		
2A3	Personalized treatment		
3A1	App/phone use	3B. User Guidance	
3A2	Questionnaires		
3A3	Notes		
3A4	Recommendations/key take-aways		
4A1	Walking test	4B. Test Instructions	
4A2	Cognition test		
4A3	Results		
5A1	Withdraw/give consent	5B. Privacy	Privacy and Data governance
5A2	Rights and regulations		
6A1	Use of personal data	6B. Data	
6A2	Storage of personal data		
6A3	Data access		
6A4	Data sharing		

Figure 1. Finalized coding scheme


How can MS sherpa help you gain personal insights into MS? 2A1

Monitoring of MS is regularly part of a clinical visit. The disadvantage of this is that it is only possible several times a year. Another disadvantage 2A1 is that you are not measured in your own environment. With MS sherpa, 2A2 you can take weekly measurements yourself in your own environment. You and your caregivers can see the results of these measurements in the app. 1A3 2A2

MS sherpa supports:

✓ Home monitoring by digital clinical tests without a clinical visit 1A1

✓ Self-perform three clinical tests:

- A Walking test 1A1
- A cognitive test
- Questionnaires with personal notes

Figure 2. Coding snippet

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Conclusion

While it is relevant to look at what the analysis finds in the text, it might be even more relevant to regard what it does not find. The analysis shows that one of the most relevant themes mentioned in EGTAI, **transparency**, is excluded from the documents. Neither document explains how the system processes data, how AI contributes to generating results, or what the system's limitations are. Further review shows any information about the apps algorithms and AI use is absent from the MS Sherpa website[2] and related articles; the app's **proprietary algorithms remain opaque** to both patients and physicians. **Digital health applications may meet legal compliance requirements while still failing to provide patients with practical clarity and empowerment.**

mHealth developers must prioritize transparency and clear communication of ethical practices, especially concerning AI usage. Incorporating these considerations early on in the development process can not only enhance user trust but also **strengthen the physician-patient relationship** by fostering a shared understanding of how patient data is managed and protected.

Specifically for MS Sherpa, the user manual and privacy document could be extended with information about error handling, how information is extracted from the data generated, and where exactly AI comes into play.

References

1. Commission, E., Directorate-General for Communications Networks, C., & Technology. (2019). Ethics guidelines for trustworthy ai. Publications Office. doi: doi/10.2759/346720

*2. Sherpa B.V. (2024). **Ms sherpa website**. Retrieved 02-12-2024, from **https://www.mssherpa.nl/en/***