



Norwegian Centre for  
E-health Research

# The evolution of clinicians' preparedness for mHealth use (2013-2017) and current barriers

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# BACKGROUND

*Full Flow of Health Data Between Patients and Health Care  
Systems*



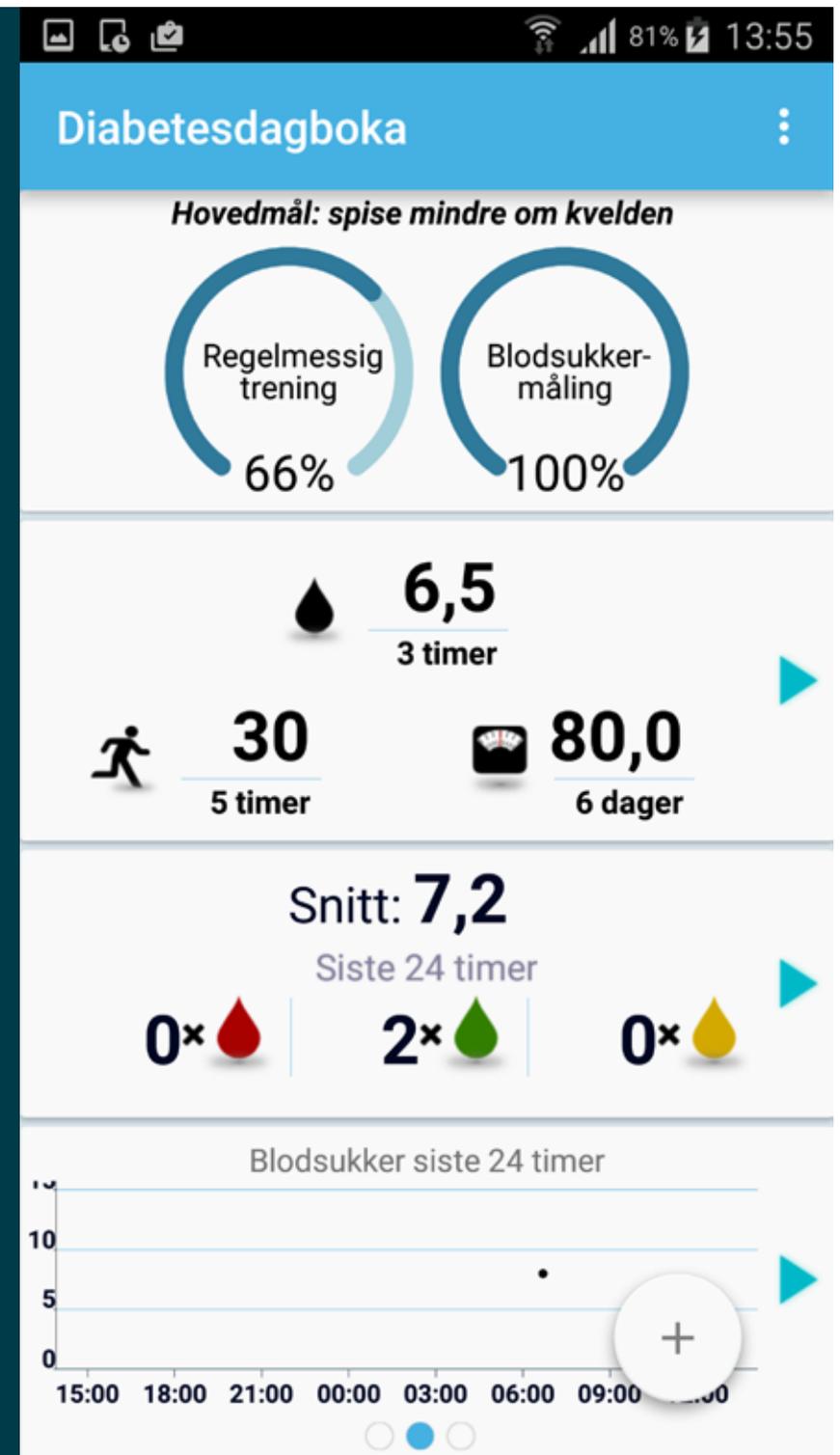
# Background

- **“IN THE OLD DAYS”**: Medical devices for diabetes self-management and treatment were validated by health authorities. Clinicians were provided with structured guidelines and protocols for how to instruct their patients to use such technologies and recorded data.
- **“THE NEW DIGITAL MEDICINE”**: Patient-operated mHealth tools enable patients to become more knowledgeable of their own health challenges and more in control of treatment priorities by providing them the means to better understand their own disease.
- **CONSEQUENCE**: Clinicians are now expected to adapt not only to patients’ new capacity to self-manage but also analyze larger patient-generated data sets.



# Background

- **CONCERN:** Lack of validation and testing within clinical settings make medical personnel concerned with clinical integration of e.g. mHealth apps.
- **PATIENT ONLY:** apps mostly designed for use by patients only, and not clinicians.





# Background

- **THE GOAL OF OUR STUDY:** to identify the change in clinicians' perceptions related to mHealth between 2013 and 2017.
- By comparing this progress to the guidelines provided by regional and national health authorities we identify and emphasize the lack of necessary support for clinicians as well as the importance of including them in the planning and implementation of mHealth within clinical practices.



# METHODS

- **Three narrative reviews.**
- First two: Health research literature (2013-2017) that described mHealth interventions in which patient-gathered data were shared with clinicians.
- Third: Review of best practice recommendations produced by healthcare authorities, during the same period, regarding how clinicians should use patient-gathered mHealth data.



# RESULTS

- The first table summarizes the results related to clinicians' perceptions of the mHealth tools that were presented to them, both from previously published and unpublished (UP) reports from our studies.

Ref.	Benefits	Concerns and needs
<b>2013</b>		
UP	<ul style="list-style-type: none"> <li>PGD would be useful (n=17/23)</li> <li>Would give recommendations based on PGD (n=17/23)</li> </ul>	<ul style="list-style-type: none"> <li>Unclear financing (n=12/23)</li> <li>Would require re-organizing services (n=11/23)</li> <li>Training/supporting patients (n=11/23)</li> </ul>
<b>2014</b>		
UP	<ul style="list-style-type: none"> <li>Better preparations of consultations (n=15/15)</li> <li>Better able to help patients (n=13/15)</li> <li>More effective communication with colleagues (n=9/15)</li> </ul>	<ul style="list-style-type: none"> <li>More knowledge required about “patient compliance” (n=12/15) and “Integration into EHRs” (n=12/15)</li> <li>Clinicians would need more “direct experience” (n=13/15) and training via “seminars” (n=13/15)</li> </ul>
<b>2015</b>		
[11]	<ul style="list-style-type: none"> <li>Comfort with the system increase over time</li> <li>Increase understanding of the patient situation</li> <li>Graphical displays of data improved understanding of patient situation</li> </ul>	<ul style="list-style-type: none"> <li>Not all patients present data, which is needed for clinicians to provide guidance</li> </ul>
<b>2016</b>		
[12]	<ul style="list-style-type: none"> <li>Easier to present PGD</li> <li>Eager to discuss app data as graphs and trends</li> <li>Patients reflect on data</li> <li>Patients can and should take initiative during consults</li> </ul>	<ul style="list-style-type: none"> <li>Must operate with existing medical technology</li> <li>Data can be “noisy”</li> <li>Patients need intensive training about how to collect data for medical purposes</li> <li>Not all patients present data</li> </ul>
<b>2017</b>		
[13]	<ul style="list-style-type: none"> <li>Can base discussion and advice on personalized data</li> <li>Result in more concrete discussions</li> <li>Patients can become more engaged in their health</li> <li>Specific information will save time</li> </ul>	<ul style="list-style-type: none"> <li>Patients don’t always present their data</li> <li>Must be easy to collect data</li> <li>Chance of data overload</li> <li>Could be too time consuming</li> <li>Clinicians still need to learn more about mHealth tools</li> </ul>

Scientific literature search results: clinicians’ perceptions related to use of mHealth tools and patient-gathered data (PGD)



**TABLE 2 SKIPPED**



# Results

- The third table summarizes the recommendations provided by health authorities for how clinicians should relate to mHealth and patient-gathered data (PGD).
- This enabled us to compare if such recommendations meet clinicians' needs, as presented by the concerns and needs reported in Tables 1 and 2.

Ref.	Recommendations
<b>2015</b>	
[20]	Proposes Continua as the standard for welfare technology
[21]	<p>Guidelines for recommending apps to patients:</p> <ul style="list-style-type: none"> <li>• Tailor app recommendations to patients and discuss consent regarding use of data and limits to consent</li> <li>• Discuss effective apps with colleagues</li> <li>• “Adhere to legislation and regulation (if existing) and/or professional obligations”</li> <li>• If the app is used for monitoring, the physician should instruct the patient how to respond to the information provided</li> </ul> <p>Clinicians should look for the following characteristics before choosing an app:</p> <ul style="list-style-type: none"> <li>• Endorsement by professional or reputable health organization</li> <li>• Usability and evidence of impact - clinicians may also test the app themselves before recommending it</li> <li>• Reliability of information: inquire about how the patient intends to use the app to determine if the information provided is appropriate</li> <li>• Privacy/security: inform patients of added security risk of using apps, and even recommend apps with additional levels of authentication vs. apps without</li> <li>• Avoids conflicts of interest and fragmentation of health information</li> </ul>
[22]	<ul style="list-style-type: none"> <li>• Do not use medical apps that do not have a CE Mark, or if they do not “meet the requirements of the medical device directives and regulations”</li> <li>• “Exercise professional judgment before relying on information from an app”</li> </ul>
[23]	<ul style="list-style-type: none"> <li>• Clinicians should differentiate medical and non-medical mobile apps – differentiating characteristics are provided</li> </ul>
<b>2016</b>	
[24]	<ul style="list-style-type: none"> <li>• Clinicians should tailor recommendations to the disease and the mHealth apps/PGD presented by patients – example scenarios provided</li> </ul>
<b>2017</b>	
	<ul style="list-style-type: none"> <li>• None found</li> </ul>

*Health authorities' clinical practice recommendations for clinicians' use of mHealth and PGD.*



# DISCUSSION



# Discussion

- Clinicians have traditionally relied upon health authorities and management to provide guidance regarding clinical practice.
- With the introduction of mhealth technologies to the options of patient self-management aids, clinicians have been, and continue to be, at a loss for answers.



# Discussion

- But, clinicians are acknowledging the benefits of these technologies more and more, especially since patients require more frequent support than the medical system is able to provide.
- Given the diversity of mHealth-generated data, health authorities and facility managers must provide support and suggestions for how care providers should relate to such technologies within differing clinical specialties in order for integration of mHealth to be successful.



# Discussion

- **QUESTION:** Are the recommendations provided by regulatory bodies evolving quickly enough to meet the needs to clinicians in the rapidly changing environment of mHealth?
- **ANSWER:** Comparison of clinicians' perceptions of mHealth over time and guidance produced by regulatory bodies demonstrate that health and care authorities are beginning to propose the type of specific suggestions for relating to mHealth that clinicians need.
- However, the majority of the official activities under-way involve preparation for secure technological integration on the back-end.
- There have been few guidelines or recommendations for how clinicians can use data gathered by mHealth tools such as apps and sensors in daily practice.



# Discussion

- Questions remain regarding how patient-gathered lifestyle and health data should be weighted and considered alongside clinically generated information, e.g. lab results, to inform and generate actionable health recommendations.
- In addition, it is unclear which data is appropriate for providers to register and store within their own EHR systems.



# Discussion

- Health providers are responsible for judging which information is medically necessary and relevant for clinical decisions versus which information is sensitive to the individual and, therefore, should not be shared with the rest of the coordinated care team.
- This task is made exponentially more difficult with the added volume and detail of patient-gathered data, and our current research project *Full Flow of Health Data Between Patients and Health Care Systems* will address this in the coming clinical study of a mHealth system during clinical practice in Norway.



# CONCLUSION



# Conclusions

- **OBSERVATION:** Mobile technology, such as apps for mobile phones, smartwatches, and patient-operated sensors, have led to a situation in which patients are bringing new and more data into the clinical settings.
- mHealth is a rapidly developing field and clinicians need sufficient guidance to respond to the frequent changes and challenges that this new environment calls for.



# Conclusions

- While official guidelines published by health authorities reference standards for back-end requirements for technological communication between EHRs and mHealth devices, they do not provide sufficient support for clinicians' in their daily struggle to relate to mHealth.
- **OUR RECOMMENDATION:** Active involvement of health professionals in the development of any new processes, protocols or official standards, regardless of their specialty, to relate to mHealth successfully on a daily basis. It is time to integrate mHealth learning into medical and continued-education for practicing clinicians.



# QUESTIONS?

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