

Challenges with Medication Management and the National Medication List in Sweden: An Interview Study from a Human, Organizational, and Technology Perspective

Tora HAMMAR^{a,1}, Mikael HOFFMANN^b and Lina NILSSON^a

^a*eHealth institute, Department of Medicine and Optometry, Linnaeus University*

^b*The NEPI Foundation, Stockholm, Sweden*

ORCID ID: Tora Hammar <https://orcid.org/0000-0003-1549-2469> , Mikael Hoffmann <https://orcid.org/0000-0001-9420-3316> , Lina Nilsson <https://orcid.org/0000-0003-2074-3584>

Abstract. Sweden is in the process of implementing the National Medication List (NLL). The aim of this study was to explore the challenges with the medication management process, as well as expectation for NLL, from a human, organizational, and technology perspective. This study included interviews with prescribers, nurses, pharmacists, patients, and their relatives and was conducted during March to June 2020, before the implementation of NLL. Challenges were (1) feeling lost with several different medication lists, (2) spending time searching for information, (3) being frustrated at parallel information systems, (4) patients being the carriers of information, and (5) the feeling of being responsible in an indistinct process. The expectations for NLL in Sweden were high, but there were several fears.

Keywords. Medication, shared information, sociotechnical perspective, interview

1. Introduction

The lack of a shared and up-to-date medication list can create uncertainty among patients, increases the risk of inappropriate combinations of medicines, as well as creating unnecessary extra work [1]. Sweden is in the process of introducing the National Medication List (NLL), based on a law that came into force on May 1, 2021 [2, 3]. The implementation is done in steps and the preliminary date for integration in all EHRs is December 2025. NLL is part of a complex system of people, technology and organizations where effects can influence and be influenced by many different aspects [4]. The goal for NLL is to give healthcare, pharmacies and patients access to the same information about prescribed and dispensed medications, i.e., expressed from a technological perspective (T). The aim of this study was to explore the challenges with

¹ Corresponding Author: Tora Hammar, eHealth Institute, Department of medicine and optometry, Linnaeus University, 391 82 Kalmar, Sweden, E-mail: tora.hammar@lnu.se.

the medication management process in Sweden from a human, organizational, and technology perspective. Also, this study aimed at exploring expectations of NLL in Sweden.

2. Methods

This interview study with health professionals, patients and relatives was performed during March to June 2020, before the 1st step of implementation of NLL. In total, 33 informants (23 women and 10 men) participated in this study (Table 1). The individual interviews were mainly performed via phone, but a few were done physically or via video, and lasted between 27 and 97 minutes (mean 41 minutes). Strategic selection was used to include many different perspectives. Informants lived in different parts of Sweden and worked in different sectors and handled medication either professionally or in their personal life. Patients had three or more medications, and relatives helped a family member with medications (ages from 33 to 69). A deductive data analysis was conducted where data from transcribed interviews were coded to the pre-defined categories Human (H), Organization (O), Technology (T) [5]. Thereafter subcategories were identified and classified as belonging to any of the HOT-categories or the subsection between them using an inductive method. This study was approved by the Swedish Ethical Review Authority (Dnr 2019-06553).

Table 1. Participant demographics (n=33).

Informants	Number (n=33)
Patient (three or more medications)	10
Relatives (helping close family with medication)	3
Pharmacist (community pharmacy)	8
Clinical pharmacist (health care)	2
Physician (health care)	7
Registered nurse (health care)	3

3. Results

In the analysis, six subcategories were identified based on the categories Human (H), Organization (O), and Technology (T) and the subsection between them (Figure 1). Three subcategories belonged to the middle section where all three categories overlap, and three subcategories belonged to the intersection between two of the categories.

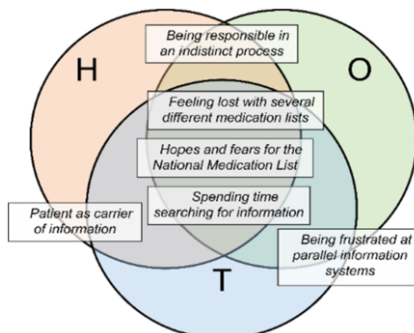


Figure 1. Categories Human (H), Organization (O), and Technology (T) and six identified subcategories.

3.1. Patient as carrier of information

Almost all patients and close family described that they felt they had to memorize and be the carrier of the information about medication they were prescribed. They reported several different tricks and tools, both digital and manual to remember what medications and when to take medications. Tricks and tools were seen as ways of feeling safe and in control of their medication treatment. Health care professionals also experiences that they had to rely on the patient (or their relatives) as carrier of information about medication treatment.

[...] you create your own system to find experienced control over your own medication. (Patient 9)

You try to connect all sources you may get and then you check it with the patient. (Physician 5)

3.2. Being responsible in an indistinct process

The medication management process was experienced by several informants to include gaps in information flow. Physicians, pharmacists, and nurses experienced that the responsibility were divided between them as professions and sometimes also with the patient. Because of incorrect lists or missing information professions stated that they needed to contact each other to double check information. Communication was expressed as challenging since professionals in different parts of the process use different systems and insufficient tools and routines for communication.

'[...] very slow [...] somewhere you wish there was a two-way communication between pharmacies and health care where you could be engaged in a dialogue or at least get a direct contact with them [health care], that you could write a question and get the prescription back' (Pharmacist 8)

Patients and relatives experienced that health care and pharmacy took responsibility for the medication. Though, when medications were changed in some way, several patients and relatives expressed worries of the medication management being less reliable.

3.3. Feeling lost with several different medication lists

Almost all informants referred to having different medication lists. Sometimes patients and close family had their own digital or manual medication list. Often, physicians, pharmacists, and nurses referred to two different lists, the medication list in the health care EHR, and the prescription list available at pharmacies (called the National prescription repository, when the study was done).

'The medication list is the current treatment of the patient; the medication you take now and why [...] your medication schedule from your physician you might say. The prescription list is a list of your current [valid] prescriptions.' (Pharmacist 4)

Although there were different lists in the medication management process, several informants stated that they trusted their list. At the same time, it was described as very common with errors and discrepancies between the lists. Some informants also used a parallel information system for patients with multi-dose drug dispensing (MDDD).

3.4. Spending time searching for information

Due to gaps in the medication management process, informants experienced the need to search and double-check information with different professions, different organizations, and with patient and sometimes close family. Several described this as a time-consuming

detective work. Searching for information included i.e., searching for interactions, changes prescriptions and dosage. Also, informants expressed that generic exchange (changing brand names at the pharmacy) contributed to increased challenges and risks for patients. Informants referred to different decision-support systems including their medication experience, digital tools, and verbal consultations.

'Well, we use the well-known Google, or 1177 and other reliable sources, you find good information there. Well, it is easy to use if you are wondering about anything, [...] It is when we want to make sure, well that we take [the medication] the right way, the dosage [...] otherwise you have health care, you can call health care and ask them, and I think that works fine.' (Close family 1)

3.5. Being frustrated at parallel information systems

In the medication management process, informant identified different information systems that were not able to share information. At the same time, informants were not able to see all information in one system and sometimes they did not have access to all information systems required in the process. Some informants stated that medications from different healthcare organization in the medication management process were not included in the same medication list. Different systems were expressed as confusing for patients, close family, and professions and may be seen as a source of errors of different kind.

'If the patient has been hospitalized, they use the ordinary EHR. And if the patient has MDDD that list [in another system] must be adjusted according to medication orders in the EHR. Sometimes they have not added or removed medications properly, so you have to check and compare. Many times, you have to contact the hospital to ask them to adjust.' (Registered nurse 3)

3.6. Hopes and fears for the National Medication List (NLL)

When this study was conducted, several of the informants had very little knowledge about NLL. Almost none of the patients and relatives knew about NLL before the interviews. Informants stated several hopes and opportunities about NLL, i.e., fewer errors in the lists, increased patient safety, and improved communication. At the same time, fears related to the implementation were expressed. Some informants were concerned about NLL being based on prescriptions rather than medication orders, the new required handling of consent and blocking of information, and the difficulties of integrating NLL. Other expressed concerns were related to the fear that NLL may cause confusion in the starting phase of implementation, and that NLL itself will not solve issues in the process. If a list is not updated and if information and communication does not flow appropriately in the process, the challenges will remain.

The handling of consent [with NLL] is a major issue. I think patients, prescribers and pharmacists will have a really hard time understanding where and when information is locked and when it is not. It is two different laws that collide (Clinical pharmacist 2)

'above all to strive for the patient to understand: ' what kind of medication do I take and why do I take them and how do the work for me?' I think that is an important part to, to get the knowledge and understanding for patients to take their prescribed medications.' (Registered Nurse 1)

4. Discussion and Conclusion

Challenges with the medication management process are related to having several different medication lists with errors, working in parallel systems, spending time

searching for information and relying on patients as carriers of information although they often lack appropriate support for this. Some of the challenges are in line previous research [1, 3, 6]. The expectations for NLL in Sweden were high, but there were fears related to the implementation. The expectations for NLL were somewhat unrealistic and not in line with the solution currently being implemented in Sweden. Concerns were related to NLL being based on prescriptions rather than medication orders (i.e., decisions about medication treatment). The medication list in modern EHRs is a compilation of connected sequences of medication orders while the e-prescription is a separate one-way communication. This discrepancy complicates integrating the list of prescriptions in NLL with the EHR in healthcare in a way that secures that the information is up to date [6-8]. Also, no one is responsible for a compiled list of prescriptions from different prescribers who haven't accessed the information. In addition, several actions by prescribers such as a change of dose or ending a treatment do not today result in corresponding changes in the list of prescriptions. These are some reasons why NLL in its current state, cannot be recommended as the medication list that patients should use. This study highlights challenges with medication management and NLL from the perspective of different actors, thus contributing with a broader understanding of the complexity. Internationally there are some results that indicate that a shared medication list may contribute to medication lists being more correct, but more research is needed to understand the effects [7, 9]. The challenges identified in this study are all connected to a combination of human, organizational and technology aspects. Most of the challenges described in this study will probably remain until NLL is integrated with health care EHR in a way so that prescribers are assisted in taking responsibility for the completeness and correctness of the information in NLL without too many extra tasks introduced.

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