



Nasjonalt senter for
e-helseforskning



Electronic Health Records User Satisfaction:
Experience after implementation of a new system in Northern Norway

Ove K Lintvedt, Espen Nordheim, Rune Pedersen

Presented by Espen Nordheim
espen.solbakken.nordheim@ehealthresearch.no





PRESENTER

Name: Espen Nordheim

Title: Advisor/ Junior
researcher

Affiliation: Norwegian Center
for E-health Research

Education: Master in Sociology





NINe -

National Implementation Research network e-health

- Collaboration with Nordic e-health research network (NeRN)
- We are working to create a collaboration between all health regions in Norway to establish a national network for implementation research
- The aim is to develop indicators at different levels: Nordic, national and regional.
- Indicators on quality, satisfaction
- Contribute to decisions with higher quality on procurement or improvement of the e-Health system in management and the health service in Norway.



Agenda

- Background
- Method
- Results
- Findings
- Discussion



Background

- Electronic Health Records (EHR) adoption has increased in the last twenty years.
- EHR systems have gone from electronic storage of health records to integrated health information systems.
- Norway has mandated a new generation of EHR systems through the national white paper 9, 'One citizen – one Health Record.
- Three of four regional health authorities used the EHR system DIPS Classic, and the fourth region used DocuLive EHR.
- Norway's four regional health regions started implementing new EHR systems in 2021, which is still ongoing.
- DIPS Classic will be replaced with DIPS Arena, and DocuLive will be replaced with EPIC EHR.
- The first health region to implement DIPS Arena was the Northern Norway Regional Health Authority.



USER SATISFACTION AND EHR IMPLEMENTATION

- Possible positive effects
 - improve efficiency, quality of care,
 - workflow,
- Possible negative consequences
 - time-consuming documentation practices
 - increased burnout.
- Implementing a new EHR system can add obstacles and barriers as
 - lack of training and support
 - restrictions on resources
 - lack of literacy.
- Installed base
 - Never built from scratch
 - An implementation should build on the installed base instead of replacing it to succeed.
- User satisfaction can be influenced by a multitude of factors, including usability and prior system experience.



Aim of the study

“To evaluate user satisfaction in the implementation phase of the new EHRR system and compare it with user satisfaction from the former EHR system to see if there is any change in satisfaction”



Why is this useful?

- The adoption of a new Electronic Health Record (EHR) is a disruptive event for hospitals influencing the satisfaction and performance of clinicians



2021 Data Collection

- Based on previously validated questionnaires
- The 2021 data collection was done in three hospitals: University Hospital of North Norway (UNN), Nordland Hospital (NLSH), and Finnmark Hospital (FSH).
- Period of two weeks to four months after the implementation
- All employees could answer, but dynamically built.
- Physicians, nurses, and other professionals accounted for 25.8%, 36.2%, and 38.0%, respectively.
- Hospitals: FSH (28.5%), NLSH (40.7%), and UNN (30.8%)
- The sampling method has limitations



Dataset

- The dataset includes three surveys from 2016, 2018, and 2021.
- The baseline data from the 2016 and 2018 surveys serve as a comparison to the results after implementing the new DIPS Arena in 2021.
- The clinical professions of physicians and nurses are included in the data analysis to compare the results from 2016, 2018, and 2021.



Baseline dataset: table 1

Health Region (Survey year)	Clinical profession		
	Physician	Nurse	Total
West (2018)	34	12	46 (15.4%)
Central (2018)	31	31	62 (20.7%)
North (2018)	22	17	39 (13.1%)
South-East (2016)	152	0	152 (50.8%)
North (2021)	57	80	137 (36.6%)
Total	265 (70.9%)	109 (29.1%)	374 (100.0%)



Baseline data

- The study included 221 EHR users (82.5% of total participants)
- Demographics: 70.1% female; mean experience 17.4 years; mean age 45.9 years
- Clinical fields: Mental health and substance abuse (30.8%), medical (29.4%), surgical (19.0%), and other (20.8%)



User Satisfaction with New EHR System

- Based on results for three types of satisfaction significantly increased after implementation of new system
 - Function satisfaction: 11 items
 - Generic satisfaction: 4 items
 - Overall satisfaction: 1 item
- + interruptions



Interruptions

- There were two questions related to interruptions of the clinical workflow while Login requests caused 4 to 50 interruptions per day (outliers removed)
- Reduction in the frequency of system interruptions, such as crashes or hangs, compared to the baseline data.



EHR Function Satisfaction

- Overall, 35.0% of respondents reported being satisfied with EHR function satisfaction
- Q5 (overview of outstanding tasks) had highest satisfaction rating (69.3%) and lowest indifferent rating (24.8%)
- Functions for Q5, Q3 (overview patients' issues), and Q4 (read radiology reports) all had high satisfaction rates, above 50%
- Q11 (overview drug treatment) had lowest satisfaction rating (16.1%) and highest dissatisfaction rating (45.3%)
- Functions for Q11, Q8 (prescribe drugs), and Q9 (plan for treatment and care) had less than 30% satisfaction ratings
- Q8 had highest indifferent rate (61.8%) and low satisfaction (9.6%) and high dissatisfaction (28.7%) ratings
- Q6 (communicate with patients), Q7 (advise further treatment), and Q10 (assess right to priority health care) had mid-range satisfaction ratings (40.1%-49.6%), low dissatisfaction ratings (5.1%-10.2%), and mid-range indifferent ratings (40.1%-54.7%)



EHR Generic Satisfaction

- Generic satisfaction refers to effectiveness, high quality, the worth of time and effort, and user-friendliness
- Overall, 49.6% of respondents were satisfied with EHR generic satisfaction
- Generic satisfaction for Quality (G2) was highest at 57.7%
- Worth the Effort (G3) had highest dissatisfaction rating at 21.3%
- All four generic items had significantly higher satisfaction rates in 2021 survey vs. baseline

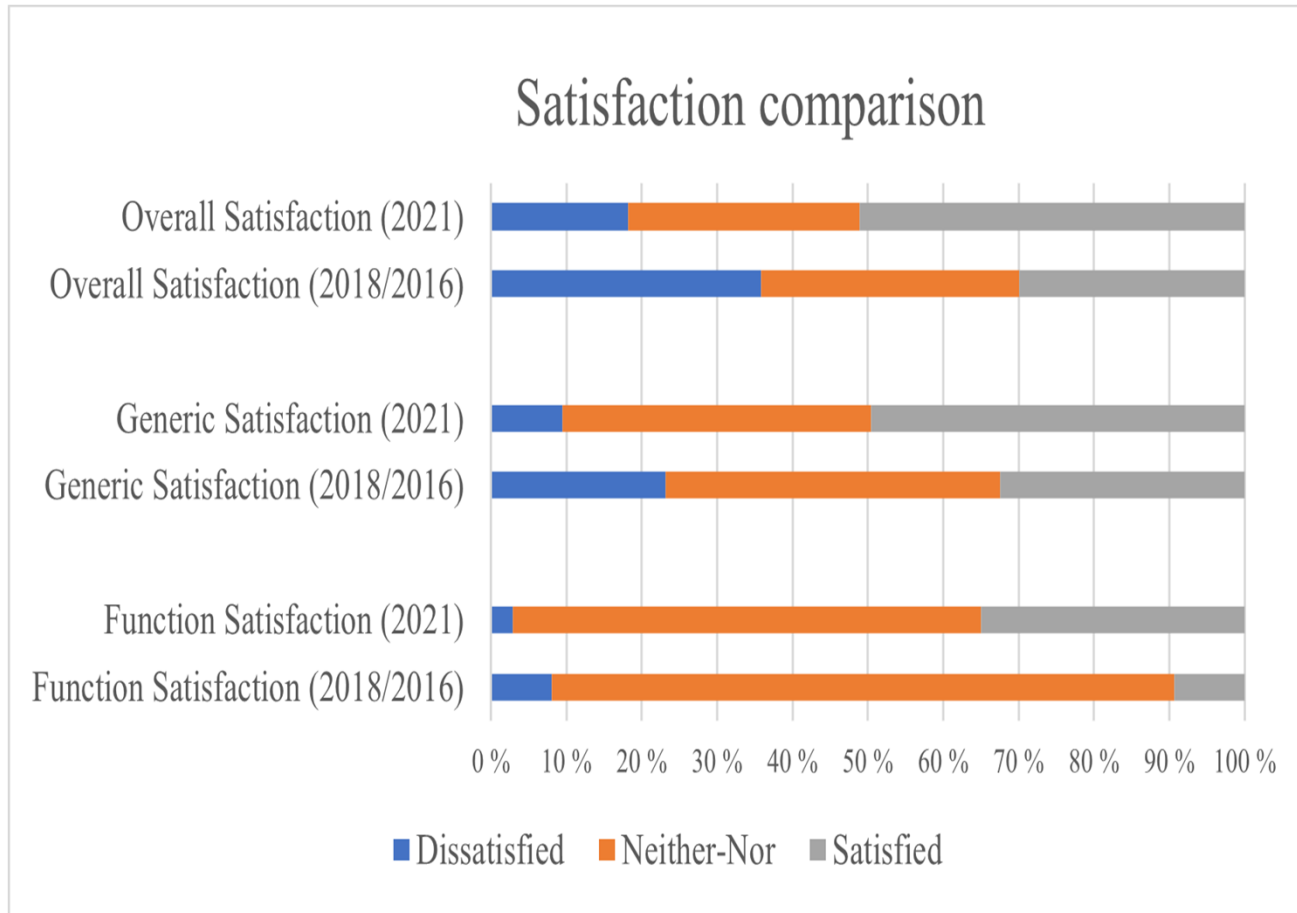


EHR Overall Satisfaction

- 51.1% of respondents were satisfied with EHR overall satisfaction
- Overall satisfaction item had significantly higher satisfaction rate in 2021 survey vs. baseline
- No significant differences were found in EHR Overall satisfaction among hospitals or user categories



Satisfaction Comparison



User Satisfaction with a New EHR System

- Study assessed user satisfaction with new EHR system in Northern Health Authorities and compared it to a baseline
- Significant improvement in user satisfaction observed
- Generic satisfaction improved with decrease in dissatisfied users
- When analyzing specific functions of the EHR system, overall improvements in functional satisfaction were observed, but some functions still required improvement.
- New EHR system well-received but certain functions need further improvements for enhanced user experience
- Findings support development of standardized usability indicators



Approach to Successful EHR System Implementation

- Unexpected outcome: New system implementation did not lead to a decrease in satisfaction
- The approach of the change between EHR systems where parts of the installed base have been kept can explain the implementation success.
- The socio-technical ensemble of systems is kept among the users, same system vendor, and slow incremental implementation process
- Structured data elements are the next implementation step.



Future work in NINe

- Continous work
 - New survey in 2023: North
- Collaboration with Regional Health Authority – «Helseplattformen»
- Further research should continue monitoring user satisfaction and consider complementing quantitative findings with qualitative research.



Thank you for listening

- Contact me on
espen.solbakken.nordheim@ehealthresearch.no