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From Tertiary to Primary Care –
Understanding Context in the Transfer of
Digital Headache Service Pathway

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Abstract. A digital service pathway for managing chronic headache has been
designed in tertiary care in Finland. The digital tool facilitates self-management by
providing exercises, information and messaging opportunities for patients. However,
the largest potential benefits are in primary and occupational care. Thus, the purpose
of this study was to explore the needs and requirements of primary and occupational
care actors for better understanding of the context in the transfer of the service. The
study was performed as a single embedded case study. The qualitative data was
collected through semi-structured interviews with 16 informants from different
organizations and analyzed with Gioia-methodology. This study gathers important
empirical knowledge about the meaning of context and transferring digital health
interventions from one context to another from clinician and management
perspective. Nine key contextual differences were identified and six main
expectations emerged.

Keywords. Telemedicine, Headache, Health Services

1. Introduction

Clinicians and researchers at Helsinki University Hospital (HUH) have developed a
digital service pathway for chronic headache patients in tertiary care. The service offers
alternative methods for treatment and provides support throughout the care pathway. The
service helps patients to recognize and manage the characteristics of their headaches.
Trained nurses act as headache coaches who supervise the progress of patients along the
pathway. There is a messaging feature through which the clinicians can be contacted in
case of questions or worries.

Headache is one of the top ten most common diagnoses in the world in 2016 besides
being the second most common cause for disability [1]. In a Danish study, tension-type
headache led to the loss of 820 workdays in 1000 persons [2]. Thus, improving the care
for headache is economically important [3]. Offering the service to wider groups of
patients, including primary and occupational care patients could increase the impact.
Occupational health care is a Finnish model for organizing primary care for working-age

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people, where the employer provides and pays for the health services to support employees’ work ability. This study concerns this move of the service from tertiary to primary care.

Researchers have recognized the difficulty of transferring healthcare interventions successfully into other contexts [4,5]. Contextual understanding acts as a basis for developing successful digital health services [6]. One way to analyze the phenomena is through a design science approach called CIMO logic, where the situation is modeled with context, intervention, mechanism, and outcome [7]. The purpose of this study was to investigate the contextual factors, which affect the transfer of a digital health intervention into other contexts. We also examined what features are valued considering the digital care of headache patients in the target contexts of primary and occupational care. RQ1: What are the key contextual differences between tertiary, primary, and occupational care in digital headache treatment? RQ2: How do the differences influence the needs and expectations of the service providers for the digital service pathway?

2. Methods

The study was performed as a single embedded case study with two units of analysis, public primary care and private occupational care. The data was collected by conducting 16 semi-structured interviews structured around the CIMO-framework [7], 10 within primary care context and 6 within occupational care context. Theoretical and snowball sampling were used. Data collection was finished after the data saturated. The public primary care organizations were from several parts of Finland with different population characteristics. The occupational care informants were from two major national service providers. Data was analyzed with Gioia-methodology and thematic analysis [8].

3. Results

Table 1 presents the identified contextual differences between the three healthcare organization types: patient population, resources, continuity of care, preventive approach, payer, IT infrastructure, adoption of digital tools, procurement, and success evaluation.

<table>
<thead>
<tr>
<th>Contextual dimension</th>
<th>Tertiary care</th>
<th>Public primary care</th>
<th>Private occupational care</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patient population</td>
<td>Selected and chronic patients</td>
<td>Wide array of patients with multiple problems</td>
<td>Working-age people, mostly tension headache</td>
</tr>
<tr>
<td>Resources</td>
<td>Specialized physicians and nurses</td>
<td>Primary level physicians and nurses, possibility to consult</td>
<td>Primary level physicians, possibility to consult specialized physicians in-house depending on the contract</td>
</tr>
<tr>
<td>Continuity of care</td>
<td>Fixed treatment periods, good follow-up during that</td>
<td>Continuous relationship with the patients, but patients are not actively monitored</td>
<td>Continuous follow-up of customer organizations and the patients. Named clinicians for each customer</td>
</tr>
<tr>
<td>Preventive approach</td>
<td>Mainly reactive treatment</td>
<td>Preventive care in some areas</td>
<td>Algorithms which aim to spot patients in risk</td>
</tr>
</tbody>
</table>
The informants underlined six main mechanisms they expected to produce good outcomes: capability to self-management, emotional support, willingness to self-management, more accurate care decisions, environment level intervention and prevention, and usability. First, the digital service encourages patients’ self-management and makes patients better informed. Second, digital emotional support could reduce the need for excessive contacts due to anxiety. Third, besides supporting the patients’ capability to self-management, also supporting their willingness to it would be important. Fourth, the tool should help in enabling professionals to provide more accurate care for the patients. Fifth, occupational care actors discussed the importance of environment level actions. Finally, usability was emphasized.

<table>
<thead>
<tr>
<th>Payer</th>
<th>Hospital districts</th>
<th>Municipalities or co-operation districts</th>
<th>Customer companies</th>
</tr>
</thead>
<tbody>
<tr>
<td>IT infrastructure</td>
<td>No digital treatment tools before headache service pathway. Every area has their own system. ODA-project in some areas.</td>
<td>Digital development programs, strategic fit is assessed. Systematic procurement according to predetermined needs. Intervention-specific indicators are developed. Effect on ability to work is essential.</td>
<td></td>
</tr>
<tr>
<td>Adoption of digital tools</td>
<td>Not under study</td>
<td>Apart from ODA, no consistent plans for future. Available resources and skills vary a lot.</td>
<td></td>
</tr>
<tr>
<td>Procurement</td>
<td>Not under study</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Success evaluation</td>
<td>Indicators: Headache days and intensity, medication, headache impact on life, quality of life, anxiety and depression, patient satisfaction, absences from work.</td>
<td>Resources and skills to measure success vary a lot. Cost efficiency through decreased service use is central.</td>
<td></td>
</tr>
</tbody>
</table>

4. Discussion and conclusions

The implications for the headache intervention developers were analyzed with regard to outcomes and intervention features. From public primary care perspective, the cost aspect was emphasized. In private occupational care, evidence is wanted on the effects on ability to work and sick leaves. Considering new features compared to the existing solution, both primary care and occupational actors were interested in self-diagnosis features. The primary care informants called for service personalization, particularly regarding age and headache intensity. The effects of the context on the desired outcomes and the mechanisms that produce these outcomes through an adapted intervention are illustrated in Figure 1.

This study gathers important empirical knowledge about the meaning of context and transferring digital health interventions from one context to another from clinician and management perspective. This study also has certain limitations. The findings from a single service pathway in the Finnish healthcare system cannot be generalized to other digital solutions in other countries, although several contextual similarities might arise.

In conclusion, nine key contextual differences were identified and six main expectations emerged in relation to the transfer of a digital headache service pathway from tertiary care to the contexts of public primary care and private occupational care.
Figure 1. Influence of the context on outcomes and mechanisms through an intervention.

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