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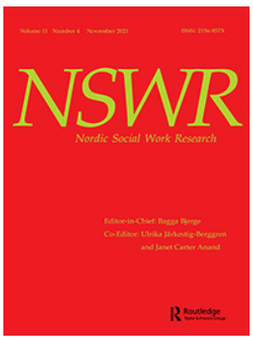

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Client information systems' support for case-based social work: experiences of Finnish social workers

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ABSTRACT

In recent years, Finland has seen extensive development in the area of social and healthcare information management aimed at harmonizing client information systems (CISs) and ways of documenting client information. The developments aim to support the utilization of recorded information at different levels of service systems, including the level of social work practice. This article investigates the relationship between social work practice and the use of CISs by answering the following question: To what extent do CISs support case-based social work in Finland? Social work is approached as a knowledge-intensive practice in which CISs have become increasingly important for managing case work. The research question is considered in relation to recent national developments in social and healthcare information management. The study uses survey data from a subpopulation of social workers (n = 309) working in municipal social services and combines quantitative and qualitative data. The findings reveal that current CISs do not offer sufficient support for case-based social work. Although CISs serve reasonably well for storing and documenting case-based information, they generally serve social workers poorly in terms of providing them with the tools they need to understand cases in their entirety and form comprehensive knowledge for their practice. To provide adequate CISs that support case-based social work, it is necessary to see social workers as active users of information and understand the role of CISs in the knowledge formation process in social work.

KEYWORDS

Client information system; case-based social work; information management; Finland

Introduction

Electronic client information systems (CISs) are technological systems for processing, storing and maintaining social welfare client information and documents. In Finland, these systems are regulated by , 159/2007. In social work practice, CISs are essential tools for managing information about cases, and are used in the public social welfare sector of almost every municipality in Finland. Several brands of CIS are used in social work, although most of them have been developed by only a few large data systems manufacturers (Jormanainen, Parhiala, and Rötsä 2019). The detailed requirements set for all CISs are planned, controlled and supervised by the Ministry of Social Affairs and Health and the National Institute for Health and Welfare (THL). These requirements include general principles and policies, as well as extensive and detailed specifications for CISs to ensure interoperability of the systems, uniform processing and handling of client information, e-services and secondary data utilization (Pentikäinen et al. 2019).

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In 2014, the Ministry of Social Affairs and Health (2015) introduced a national strategy for information management, one of the main objectives of which was to provide smart information systems to support social and health care professionals by 2020. This was rather optimistic considering that no national-level research had been conducted to map social welfare professionals' experiences of current CISs and because the experiences reported by health care professionals were not encouraging (Martikainen et al. 2012). It was not until 2019 that social welfare professionals' evaluations of CISs were collected, and the evaluations of social workers, as a specific group, have yet to be examined (Ylönen et al. 2020). However, evaluations of municipal social workers are particularly important, as they are responsible for managing client cases in social welfare services. Currently, local public authorities (municipalities) are responsible for organizing and funding social services. However, in 2023, regions will take responsibility for organizing both health and social services.

The national strategy for information management was based on the broader Strategy for Social and Health Policy for a socially sustainable society, which sought more effective ways of utilizing well-being-related information and delivering social and health care services. Information management was seen to have a significant role in increasing the effectiveness and efficiency of the service system. The national strategy for information management underlined a shift from the collection and transfer of information to the utilization of information at the national and organizational levels, in research, practical work and citizens' lives. (Ministry of Social Affairs and Health 2015.) Guided by national strategies, Finland has sought to promote the utilization of information by updating legislation, developing detailed definitions to harmonize CIS, and training social work professionals to improve the quality of documentation and efficiency. Together with the establishment of national client data archives, these developments are moving social work towards structured information processing (Kuusisto-Niemi, Ryhänen, and Hyppönen 2018). The national guidelines and specifications for information management have led organizations to develop and update their CISs, and some have sought to combine social and healthcare data into a shared CIS. The strategy was evaluated in 2018, and a lack of participation of social and health care professionals in the planning and evaluation of the strategy was noted. Although the content was found to be topical, the measures implemented seemed rather modest (Seppälä and Puranen 2019).

Previous research on social work CISs has mainly focused on the field of child welfare (e.g. De Witte, Declercq, and Hermans 2016; Huuskonen and Vakkari 2013; Sarwar and Harris 2019), but the perspective of case-based social work has not been examined explicitly. The aim of the current study was to investigate the relationship between case-based social work practice and the use of CISs. In examining CISs in relation to case-based social work, we ask: To what extent do CISs support case-based social work in Finland? We begin by discussing what kind of client information is central to social work and why. We then describe how CISs have come to play a role in the formation of case-based knowledge. We use survey data on municipal social workers' experiences of current CISs, analysing and combining quantitative and qualitative data to answer the research question. We conclude with recommendations for CIS development and suggestions for future research.

Case-based knowledge formation in social work practice

In social work practice, it is important to understand the client's overall situation in their social context (Hall et al. 2010; Richmond 1922). This has been at the very essence of knowledge-based social work since its early days, when, 120 years ago, Mary Richmond presented her famous circle diagram highlighting the relationship between the individual and their environment (Richmond 1901). The relationship between clients and their environment was later highlighted, for example, in systems theory approaches to social work, which emphasize the importance of gaining a comprehensive understanding of the client's situation, including their social relations (Gitterman and Germain 2008, 51–53). The significance of various social systems is also acknowledged by the

International Federation of Social Workers in the commentary notes for the Global Definition of Social Work (International Federation of Social Workers 2014). Today, it is still relevant, and at the core of social work to address the 'individual person in a situation' (Richmond 1917, 10).

Richmond later developed the idea of social case work, where the case also refers to the process of social work (Richmond 1922). In Finland, the process of public social work includes assessment, development of a service plan, arrangement of the services and necessary decision making (The Social Welfare Act , [1301] 2014). A comprehensive assessment of the client's life situation is a key part of the social work process and is usually conducted in active cooperation with the client. It involves gathering, organizing, analysing and synthesising information about the client and their history, situation and relationships with family members, friends, relatives, professionals and so forth (Eskola 2003; Niskala 2008; Richmond 1922). Once collected, the information should be organised in such a way that it is possible to establish a structured understanding of the client's overall situation, which functions as the basis of the work (Gitterman and Germain 2008, pp. 112–113; Niskala 2008; Richmond 1917).

The client's life situation and assessment of it are dynamic processes that help examine the actualisation of the service plan and assess the need for the continuation of services. As the situation changes, the social worker must continually apply and evaluate new information to make timely decisions (Eskola 2003; Niskala 2008). Complexities typical of social work require social workers to use different types of knowledge (theoretical, factual and practical) to obtain an adequate understanding of a client's situation (Trevithick 2008). This knowledge formation process is affected by various knowledge practices, such as documentation, and happens together with the client and their kinship and multiprofessional networks (Eskola 2003; Kääriäinen 2016; Pohjola and Korhonen 2014; Räsänen 2014). In the current article, we refer to this process as case-based knowledge formation.

Forming a reliable understanding of the client's situation is crucial in municipal social work, where case-based knowledge is used to make decisions that can have pivotal and far-reaching impacts on clients' lives (Niskala 2008; Huuskonen and Vakkari 2013). This highlights the need for social workers to have access to sufficient, reliable and relevant information (Räsänen 2014). Today, CISs are crucial tools for managing high volumes of information by facilitating the collection, analysis and monitoring of data (Mattaini and Kirk 1991; Fitch 2019). Here, we make a distinction between data, information and knowledge by providing an example of how they differ in the case-based knowledge formation process: Data are small pieces of information usually presented in numeral form (e.g. 1, 2), whereas information is data that is given a label (e.g. 1 = mother, 2 = father), and knowledge is formed when a social worker uses this information to form an understanding of a client's situation (e.g. identifying the primary caregiver of the child) (Fitch 2019, 110). When using CIS, it is necessary to structure phenomena into information and split the information into data, in order to enable automatic processing and utilization of data. The utilization of this data enables new knowledge to be formed. (Tuomi 1999.) This new knowledge can also be used to modify a CIS in order to assure the availability of the information needed to make professional decisions at different organizational levels (Fitch 2019).

Challenges and potential of CISs in case-based social work

The need for enhancements to existing CISs used in Finland is evident from previous research, which has identified challenges regarding usability, collaboration and the flow and use of information recorded in CISs (Huuskonen and Vakkari 2013; Ylönen et al. 2020), including difficulties in finding the core of a case from long, miscellaneous case reports (Huuskonen and Vakkari 2015). In other countries, difficulties have also been reported regarding social workers' ability to access or record information relevant for practice (Pithouse et al. 2012; Gillingham 2011), compile an

understanding of the case because of fragmented documentation (Pithouse et al. 2012; De Witte, Declercq, and Hermans 2016) and locate clients in their familial, social and relational contexts (Hall et al. 2010; Wastell and White 2014).

For a CIS to support case-based knowledge formation, it must meet several specific requirements: the ability to express diversity, group information and explore trends, find key information and significant events, link families and children together (Wastell and White 2014), preserve a narrative and relational approach (De Witte, Declercq, and Hermans 2016), and ensure access to the CIS for clients and networks to facilitate joint knowledge formation (Gillingham 2014; Pohjola and Korhonen 2014). Although advanced ways of presenting, structuring and analysing case-based information in social work have been envisioned for decades (e.g. Mattaini and Kirk 1991), their implementation in practice has proved challenging. A lack of visual signals, icons, and appropriate tools and conceptual contradictions have made it difficult for CISs to meet the information needs of case-based social work (Huuskonen and Vakkari 2013; Wastell and White 2014; Lagsten and Andersson 2018).

Insufficient consideration of social workers' needs in the development of CISs has been identified as a major reason for the failure of CISs to support social work practice (Gillingham 2014; Devlieghere and Roose 2019; Koskinen 2014). Research has demonstrated that managerial needs have been prioritized over those of practice (e.g. Wastell and White 2014) and that CISs have often been implemented based on governmental priorities to enhance accountability, efficiency, transparency and quality of services (e.g. Gillingham 2011). As a result, new public management structures have been incorporated and embedded into CISs (Gillingham and Graham 2016).

Parton and Kirk (2010) described how since the mid-1970s in Western Europe and North America, increased criticism of social work has led to attempts to improve accountability and overcome uncertainties by building trust in systems rather than building trust in social work professionals. The introduction of modern technologies has placed more demands on professionals to enter, manage and monitor a wide range of information through new electronic systems. At the same time, the discretion of professionals has been narrowed, especially the discretion to determine what information is relevant because the required information is predefined in the structures of CISs (Parton and Kirk 2010; see also Pithouse et al. 2012; White et al. 2010). As a consequence, the demands configured into CISs are diminishing the agency of social workers (Koskinen 2014; Sarwar and Harris 2019).

Against this background, it is not surprising that social workers are critical of CISs and fearful that information technology might contribute to de-professionalising social work (Parrott and Madoc-Jones 2008, 186). Despite the challenges related to CISs, these systems, as tools for accessing, managing and using client information, play a crucial role in the institutional tasks of modern social work (Fitch 2019; Räsänen 2014). They also have significant unrealised potential (Parrott and Madoc-Jones 2008; Pohjola and Korhonen 2014). For this potential to be actualized and for the identified challenges and risks to be overcome, it is evident that social work needs must be considered in the development of future CISs (Fitch 2019; Martikainen et al. 2020; see also International Federation of Social Workers 2018). However, it must also be considered that social workers have struggled to adequately express their needs to the designers of CISs, which indicates that special expertise is needed to facilitate successful cooperative development work (e.g. Gillingham 2014).

Methodology

Data

Our study is based on questionnaire data gathered in Finland in April and May 2019. Previous research concerning the use of CIS in social work has focused on child welfare (e.g. Huuskonen and Vakkari 2015) and employed mainly qualitative methods (e.g. Räsänen 2014; Sarwar and Harris

Table 1. Data characteristics.

	n	%
Gender	307	
Female	290	94
Male	15	5
Other	2	1
Age	309	
Under 35	39	13
35–44	102	33
45–54	85	28
over 54	83	27
Area	278	
Northern Finland	43	14
Eastern Finland	29	9
Western and Central Finland	92	30
Southern Finland	114	37
Education	309	
Master's degree or higher	255	83
Bachelor's degree	44	14
Other	10	3
Speciality	308	
Child welfare	128	42
Adult services	67	22
Services for the disabled	29	9
Generalist	29	9
Elderly services	13	4
Other	42	14
Experience with IS (self-reported)	309	
Highly experienced	238	77
Less experienced	66	21
Beginner	5	2

2019). The use of a survey enabled us to systematically collect the assessments of social workers in different fields on a national level and utilize Likert scales to examine variations in the degrees of comparable assessments between different CISs. This national cross-sectional survey was targeted at social welfare professionals and inquired about their user experiences of CISs (Ylönen et al. 2020). The study acted as a pilot for a survey included in a nationwide project organised by the THL. The questionnaire included measures adjusted from the validated National Usability-Focused HIS Scale (NuHISS, Hyppönen et al. 2019).

A link to the questionnaire was sent by email to all working-age social welfare professionals under 65 years of age who were members of either Talentia Union of Professional Social Workers, the Trade Union for the Public and Welfare Sectors or the Social Work Research Society. In total, data was received from 1,145 respondents. For this study, we analysed the data from a subpopulation of social workers (n = 309) who reported working in municipal social services. Table 1 presents the characteristics of the subsample analysed.

Most of the respondents were highly educated social workers and experienced CIS users. Although the number of respondents was small, the responses formed sufficient material for the study. The aim was not to make extensive empirical generalisations across social workers as a group but instead to open up new perspectives on the research topic. We had 309 expert responses at our disposal, of which 89 also contained qualitative data. The respondents reported using 15 brands of CISs. Two of the most common ones were used by 67% of the respondents. A comparison between brands would require a more balanced sample. However, previous research reveals that user experiences vary somewhat depending on the brand used but that dissatisfaction is general, regardless of the brand (Ylönen et al. 2020).

Measurements

To measure how CISs support case-based social work, we analysed two sets of quantitative questions and one qualitative question (Appendix A1). First, we analysed two multiple-response items; next, we analysed six items rated on a five-point Likert scale. The two multiple-response items were based on known problems and well-working features of CIS. Six Likert-scale items were based on the theme of case-based information and referred to six variables derived from the literature on the use of CISs in social work: comprehensiveness (e.g. Hall et al. 2010; De Witte, Declercq, and Hermans 2016), social relations (e.g. Hall et al. 2010; Pithouse et al. 2012; Wastell and White 2014), reliability (e.g. Huuskonen and Vakkari 2015), history (e.g. Wastell and White 2014; Huuskonen and Vakkari 2015) and services (e.g. Räsänen 2014). Variables were shaped in work groups, which involved experienced social workers, information system developers and researchers. Variables were developed into Likert-scale answers to align with the variables in the NuHISS instrument (Hyppönen et al. 2019), which served as the basis of the questionnaire. Qualitative data included answers (n = 89) to an open-ended question regarding comments and feedback on CISs. The qualitative data contained a total of 3,162 words.

Analytical procedures

We analysed the data primarily using descriptive statistics, but also used a principal component analysis (PCA) with direct oblimin rotation and reliability analysis for six Likert-scale variables. The PCA yielded one component including all six variables, and Cronbach's alpha was .865. A composite variable was computed and named 'CIS support' for case-based knowledge formation. The composite variable was categorized into three groups: CIS support for case-based knowledge formation was deemed 'poor' (scores 1–2.69), 'neither poor nor good' (scores 2.7–3.3) or 'good' (scores 3.31–5). Statistical analyses were conducted using SPSS v.26.

We analysed the qualitative data from the open-ended questions as complementary data to elaborate, enhance and clarify the quantitative results (Greene, Caracelli, and Graham 1989). Using theory-based content analysis (Aneshensel 2016), we scanned each comment and identified the content concerning the themes included in the quantitative data. Our use of qualitative data enabled us to illustrate our quantitative findings (Bryman 2006) and expand and strengthen our conclusions (Schoonenboom and Johnson 2017).

Ethical considerations

We followed the ethical principles of research, and the research permit practices of each organization involved were carefully planned and applied (Finnish Advisory Board on Research Integrity 2012). The entire study protocol was examined and approved by the Ethics Committee of Aalto University. We drew up an agreement for the joint processing of the data between our affiliated institutions and Aalto University. A privacy statement was included at the beginning of the questionnaire, and every respondent gave their informed consent to participate. No personal identification data were handed over to the researchers by the trade unions.

Limitations

Our study is based on a small set of data collected as part of a pilot study in Finland. The comprehensiveness and representativeness of the data can only be approximated because all social workers are not members of the unions or societies drawn from here. The exact response rate cannot be calculated because memberships to unions and societies can overlap, and it was not

possible to send individualised links to the questionnaire due to privacy issues (GDPR). The fact that several brands of CIS are used in social work in Finland must also be considered when applying the results.

Findings

What works and does not work in current CISs?

The respondents were presented with lists of 15 known problems and 15 well-working features in CISs and asked to identify those they found applicable (Appendix B1). From the problems list, the most frequently given response was: *You can't get an idea of the client's overall situation at once* (66%). Other frequently acknowledged problems included *transmitting information from other systems* (62%), *information exchange* and *collaboration between professionals* (49%) and *the need to record the same information in several places* (49%). Because the number of responses was limited and most respondents gave all five responses, it was not possible to deduce whether the less frequently chosen points indicated a lack of problems in those areas. Instead, the list forms an order of precedence of the problems that hamper social workers' practice the most.

From the list of the well-working features in CISs, the most frequently given response was as follows: *Documentation of client information* (43%). This is interesting because 30% of the respondents identified a lack of support for smooth documentation as a problem. Other areas where there was similar division in responses concerned CIS support for communication between professionals. From the identified problems list, a frequently given response was *information exchange* and *collaboration between professionals* (49%), and from the well-working features list, 33% selected *secure communication between professionals*. The results indicate that one-third of the respondents use a CIS that supports secure communication between professionals. This is important for multi-professional cooperation and is a feature that should be accessible to everyone. However, providing a secure communication tool might not be enough to support actual information exchange and collaboration between professionals.

Only 3% selected *secure communication between a professional and a client* as a well-working feature of their CIS. This is a concern because secure communication can support client engagement and participation.

The respondents' comments to the open-ended question about CISs were generally highly critical and related to the challenges faced when using a CIS. The respondents used adjectives such as clumsy, stiff, difficult to use, miserable, fragmented, slow, old and bad to describe the CIS. Some respondents used CISs that were designed for health care:

> The CIS as such is not suitable for social work. Headlines, etc., are clearly built for the needs of health services, not for social work. We have to choose strange titles in both statistics and text that do not describe our work.

Several comments highlighted the need to modernise the systems:

> The CIS is no longer an information system of this time, but an ancient relic.

> The information system has stagnated into the 1990s.

There were only a few positive comments on the use of a CIS. Those respondents who offered such comments said that the CIS itself was logical, easy to modify, easy to learn or user-friendly. However, these comments also contained critical feedback, such as the following:

The CIS is fairly simple for basic work, but it does not meet modern needs.

Our analysis of the identified problems and well-working features of current CISs revealed that although 43% of the respondents found entering documentation into a CIS easy, many reported that the CIS did not support the retrieval of this information (38%) for use in their daily work, especially in relation to understanding the client's situation (66%) or the stages of the service process (34%). Finnish CISs have largely relied on free-form narrative documentation. This can

Table 2. Social workers' evaluations of CIS support in understanding a case.

CIS supports the formation of an overall understanding of:	Very good	Fairly good	Neither good nor poor	Fairly poor	Very poor	N
Up-to-date and reliable understanding of the case	5% (15)	39% (119)	19% (58)	29% (90)	8% (26)	308
Comprehensive and holistic understanding of the case	4% (13)	29% (89)	18% (56)	38% (115)	11% (34)	307
Client's multiprofessional network	2% (5)	17% (52)	14% (43)	42% (128)	26% (80)	308
Client's kinship network	2% (5)	10% (31)	19% (59)	41% (125)	28% (87)	307
Client's services (previous, current and planned)	4% (11)	22% (69)	22% (68)	37% (115)	15% (45)	308
Client's history	4% (11)	31% (96)	22% (69)	29% (88)	14% (44)	308

affect users' experiences regarding ease of documentation. It is also more cumbersome to retrieve relevant information from long narrative texts (see Huuskonen and Vakkari 2013), and there are fewer technical tools in use to aid in this task. Current CISs seem dated and do not meet the requirements of social work.

CIS support in forming an understanding of a client's situation

The respondents were asked to assess how well their current CIS supported forming an overall understanding of a case (Table 2).

Of all respondents, 68–69% answered that CIS support for understanding clients' multiprofessional or kinship networks was fairly poor or very poor. This is a concern, since understanding clients' social networks is key in case-based social work for understanding clients in their context. One respondent described this issue as follows:

> It is difficult . . . not being able to document information about a child and family shared by other family members . . ., even though it is necessary for the child's case. Also, it is too cumbersome to document the same information for all family members involved.

On this point, 52% of the respondents assessed the CIS' support for forming an overall understanding of the client's previous, current and future services as fairly poor or very poor, while 26% reported the support in this area as fairly good or very good.

Some respondents described how national specifications guide the development of the CISs:

> The system vendor sometimes argues that our needs cannot be met because they only implement amendments according to the THL demands.

Forty-nine per cent of the respondents assessed the CIS support for gaining a comprehensive and holistic understanding of a client's situation as fairly poor or very poor, whereas 33% reported it as fairly good or very good. It was commonly reported that the information needed was in different information systems and that finding the necessary information was cumbersome for reasons such as a lack of meta-information:

> There is no possibility of naming the documents in any way. This creates challenges in practice since each client document must be opened separately in order to figure out the content of the document.

Some respondents explained that it was impossible to manage information in its entirety through the CIS, so they had to resort to other means, such as using an external word processor to write up extencive statements and decisions.

> Writing fields are too small in CIS. When you need to write several pages for the administrative court and you have a big screen, then it's nonsensical that you have to fiddle with this little window where there are only five lines of written text visible.

Utilizing external solutions to process sensitive client data increases data security and data protection risks, raising ethical concerns.

Of all the respondents, 43% reported that CIS support for forming an overall understanding of a client's history was fairly poor or very poor, whereas 35% reported it as fairly good or very good. Here, 44% of the respondents assessed CIS support for forming an up-to-date and reliable understanding of a client's situation as fairly good or very good, and 37% reported it as fairly poor or very poor.

Some respondents reported that it was difficult to outline a client's history because the CIS did not provide a comprehensive picture of the case, mostly because information is spread across several systems or fragmented in different parts of the system:

> The summary form should include family information, the reason for initial contact, and encounter dates so that we would not have to search this information every time. This is very time-consuming.

Some respondents also requested visualization and graphical tools to be able to perceive the client's history and overall situation.

CIS' (overall) support for case-based knowledge formation and barriers for development

Figure 1 shows the respondents' overall judgment of CIS support for case-based knowledge formation, based on a PCA.

In total, 57% of the overall responses regarding CIS support for case-based knowledge formation described poor support, whereas 24% reported good support. This reveals that there is a lot of room for improvement of current CISs. Some of the respondents perceived the CIS as a burden and explained that their needs and wishes for developing the CIS were not heard, mostly because of managerial or governmental restrictions:

> Responsibility has been with senior management who do not use the CIS.

> Unfortunately, some of the client work has to be carried out on the CIS's terms.

> The CIS's operation should conform to the user's needs, not the other way around.

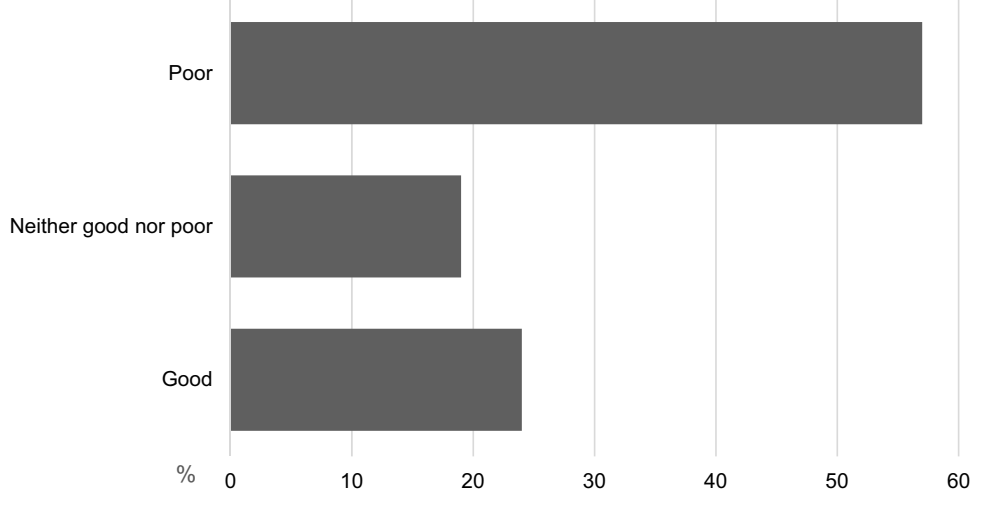

Figure 1. CIS support for case-based knowledge formation (n = 308).

Some respondents also explained that developments were hindered because of financial restraints or postponed while waiting for a new system. In some responses, it was not clear who was responsible for decisions related to the development of the CIS.

Discussion

Our main finding is that Finnish CISs do not provide sufficient support for case-based social work for the majority of social workers, although there are some who perceive CIS support as adequate. Our study shows that although CISs generally serve well for storing and documenting information on cases, they serve poorly in terms of providing social workers with the essential information they need when working with clients (see also Hall et al. 2010; Huuskonen and Vakkari 2013). The main deficiency was the CISs' lack of support for obtaining a comprehensive understanding of a case. The CIS support was found to be poorest in the area of determining clients' social networks, even though this is essential for case-based social work and for understanding clients in their context (Gitterman and Germain 2008; Hall et al. 2010; Richmond 1901, 1917). This deficiency obstructs social workers' access to the information they need, severely hampering the case-based knowledge formation process. Our results confirm those of previous studies on CISs' deficiencies in relation to obtaining a holistic view of a case (Hall et al. 2010; Huuskonen and Vakkari 2013, 2015; Pithouse et al. 2012). Inaccuracy of recorded information (see Huuskonen and Vakkari 2015) was not among social workers' main concerns, although over a third did report challenges in this area. In many social work tasks, obtaining reliable and sufficient information about a case is critical, and CISs play a crucial role in facilitating this (Fitch 2019; Räsänen 2014). Our study identifies deficiencies in CISs' support for communication and information exchange between social workers, clients and their networks. In order to facilitate collective knowledge formation and cooperation, CISs should be developed to provide secure and accessible communication tools (Gillingham 2014; Pohjola and Korhonen 2014; Räsänen 2014).

We identified several reasons for CISs' lack of support for the case-based knowledge formation process. The fragmentation of information across different systems and organizations and the lack of visualization tools, summaries, meta-level information and clear documentation practices, along with technical barriers, were all found to hinder social workers' access to necessary case-based information, forcing them to develop other ways to manage case-based information. These work-arounds can save time and support in task performance, but also pose a threat to data security (De Witte, Declercq, and Hermans 2016; Huuskonen and Vakkari 2013). Technical barriers and shortages were a surprising finding in this area considering the sophisticated technological innovations of today. It has been decades since ideas of computerizing and visualizing case-based information in a graphic way to make it available for utilization in social work practice were proposed (Mattaini and Kirk 1991). With advances in modern technology, it should be possible to develop solutions that can express the diversity and complexity of cases and describe clients in their social and relational contexts (Wastell and White 2014). Indeed, our study shows that most Finnish CISs are dated and do not meet the requirements of social work.

Recent advances in national social and healthcare information management in Finland based on the national strategy have shaped CIS development by establishing a common structure for them (Ministry of Social Affairs and Health 2015). Our results indicate that this CIS structure shapes and determines social work practice, including social work processes and client work (also Gillingham and Graham 2016; White et al. 2010) and there appears to be some tension between the established structure of CIS and social work practice. We suggest this as area for further research. Also, our study shows that the ambitious objectives of national strategy to advance the utilization of information at different levels of service system (Ministry of Social Affairs and Health 2015) are far from being met in municipal social work practice. This raises the following concerns: Have the measures focused too much on professionals as producers of information for organizational and national information needs? This would indicate prioritization of managerial needs over those of

social workers (also Gillingham 2014; Devlieghere and Roose 2019; Koskinen 2014; Wastell and White 2014). However, information is actively used in social work practice, and as our study shows, the need for case-based information is well recognised in municipal social work. If social workers are expected to be productive and respond to current demands, they should have access to the necessary tools to meet the substantive requirements of this demanding, knowledge-intensive work. A CIS should not be understood as a stand-alone system (Tuomi 1999), so it is essential to understand the process of case-based knowledge formation in the context of social work and the role of a CIS in this process.

It is an ethical responsibility of social workers to acknowledge the possible challenges that technology might place on social work (International Federation of Social Workers 2018). Previous studies have shown that some social workers perceive technology as a threat that constrains and de-professionalizes social work practice (Parrott and Madoc-Jones 2008; Parton and Kirk 2010). However, our study identifies CISs as a central tool in the case-based knowledge formation process in modern social work practice. At best, a CIS supports the formation of a comprehensive and timely understanding of a case with input from different actors, facilitating the recording, storage, transfer, retrieval and use of the information necessary to achieve the objectives of social work (Fitch 2019; Räsänen 2014). The positive experiences on CISs support in understanding a case are worth investigating in the future in order to identify the well-working features and technical solutions within CISs that enable case-based knowledge formation. This would support further CIS development. Social workers should be offered opportunities to influence the development of the CIS before and after deployment, an aim that is included in the national strategy (Martikainen et al. 2020; Ministry of Social Affairs and Health 2015). Considering our results, CIS deployment would also benefit from more collaborative research on social work and information systems and the development of specific expertise, such as social informatics (Gillingham 2011; Lagsten and Andersson 2018).

In the past, aspects of CISs have been studied in relation to certain fields of Finnish case-based social work, such as social emergency services (Räsänen 2014) and child welfare (Huuskonen and Vakkari 2013; Koskinen 2014). However, an extensive study encompassing different areas of social work has not been carried out before. Our study presents one possible way of identifying and measuring the support provided by CISs for case-based social work. This is the first version of an instrument developed for a nationwide social welfare study. Based on our study, the instrument appears to be valid, but there is also room for improvement. Here, the instrument produced a clear result: Current CISs do not yet adequately serve the majority of social workers in supporting case-based social work. Our study confirmed the challenges identified in previous qualitative studies, highlighting the fact that the problems identified are widespread across the nation and have not yet been resolved, despite the provision of comprehensive documentation training for social workers (see Huuskonen and Vakkari 2015).

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Appendix A1

Original questions in the order and as presented in the survey questionnaire:

Please evaluate (On a scale 1 (very well)–5 (very badly), how well does the (CIS trademark you currently use) support social welfare professional in forming an overall understanding of the following:

- Up-to-date and reliable understanding of the client's situation
- Comprehensive and holistic understanding of the client's situation
- The client's multiprofessional network
- The client's kinship network
- The client's history
- The client's services (previous, current and future services)?

Which problems identified in the current CISs hamper social welfare professionals work most? Select up to 5 most important development targets.

- It is not possible to get an idea of the client's overall situation at once.
- Information/data is not transmitted from other systems.
- Does not support collaboration and information exchange between professionals.
- The same information has to be recorded in several places (e.g. for different family members).
- Retrieving information from client information is cumbersome and time-consuming.
- There is no clear and/or comprehensive picture of the stages of the client process.
- Does not support smooth documentation of client information (e.g. checklists, templates, phrases are incomplete).
- Evaluation and effectiveness indicators are missing or not supported by the CIS.
- Making an official decision in the system is multistep and cumbersome.
- Use requires a lot of remembering.
- Does not guide the implementation of work steps and progress between them.
- Views and actions cannot be customised per employee (e.g. views, favourites, phrases).
- The implementation of work steps in the system does not correspond to practical work.
- The lack of electronic transaction services for citizens generates additional work for the professional.
- The timeliness of the information is poor and thus the accuracy of the information cannot be relied upon.

What works well in the current CISs? Please select the features that have been executed well in the CIS you use from the following. You may select as many as you wish.

- Documenting client information.
- Secure communication between professionals.
- Saving attachments to the information system.
- Saving and using phrases.

- In the system, the information is only visible between the required services and units.
- Summary view of your own clients.
- Utilization of data recorded once in different sections.
- Availability of statistical and monitoring data.
- Stimulus and alarms that support work.
- Summary view of client information.
- Monitoring the stages of the client process.
- Secure communication between a professional and a client.

Here you can write other comments or feedback of the CISs.

Appendix B1

Problems and well-working features in current CISs.

(Topics regarding residential services are excluded from the table since municipal social workers rarely work in residential settings or use their CISs.)

		n	%
Known problems in CIS			
	It is not possible to get an idea of the client's overall situation at once.	205	66
	Information/data is not transmitted from other systems.	192	62
	Does not support collaboration and information exchange between professionals.	152	49
	The same information has to be recorded in several places.	150	49
	Retrieving client information is cumbersome and time-consuming.	116	38
	There is no clear and/or comprehensive picture of the stages of the client process.	104	34
	Does not support smooth documentation.	92	30
	Evaluation and effectiveness indicators are missing or not supported by the CIS.	89	29
	Making an official decision is multistep and cumbersome.	78	25
	Use requires a lot of remembering.	61	20
	Does not guide the implementation of work steps and progress between them.	59	19
	Views and actions cannot be customised per employee.	54	18
	The implementation of work steps in the system does not correspond to practical work.	41	13
	The lack of electronic transaction services for citizens generates additional work.	33	11
	The timeliness of the information is poor and thus the accuracy cannot be relied upon.	17	6
Well working features in CIS			
	Documenting.	134	43
	Secure communication between professionals.	101	33
	Saving attachments.	87	28
	Saving and using phrases.	67	22
	The information is only visible between the required services and units.	49	16
	Summary view of your own clients.	48	16
	Utilization of data recorded once in different sections.	47	15
	Availability of statistical and monitoring data.	37	12
	Stimulus and alarms that support work.	34	11
	Summary view of client information.	23	7
	Monitoring the stages of the client process.	20	7
	Secure communication between a professional and a client.	9	3