Decision-makers and mediators in a home healthcare digitisation process: nurses’ experiences of implementation and use of a decision support system

Lina Nilsson* and Cecilia Fagerström

"Department of Informatics, Faculty of Technology, Linnaeus University, 391 82 Kalmar, Sweden; bThe Blekinge Center of Competence, Blekinge County Council, 371 81 Karlskrona, Sweden; cDepartment of Health and Caring Sciences, Faculty of Health and Life Sciences, Linnaeus University, Kalmar, 391 82, Sweden

(Received 3 September 2017; accepted 27 July 2018)

Background: This study focuses on a decision support system (DSS) for home healthcare and the implementation of it.

Aim: To describe home healthcare nurses’ experiences of the implementation and use of a new DSS, with a focus on how it influences decision making in everyday work practice.

Design: A qualitative research design.

Methods: Data was collected through three focus group interviews with six home healthcare nurses. The data analysis was drawn from Burnard’s method for content analysis.

Results: The DSS was experienced as bringing support to decisions, but sometimes incompatible with home healthcare nurses’ work practice. Professional understanding and the DSS were sometimes experienced as parallel support systems not assisting work across healthcare organisations.

Conclusion: When a DSS is used to transform work of healthcare organisations several aspects should be highlighted. If the organisation does not consider these aspects, nurses may adopt a role as mediator in the implementation process.

Keywords: decision support system; health care services; home care services; implementation; nursing care

Impact statement

The transformation of healthcare organisations through digitisation requires content priority, organisational readiness and the inclusion of healthcare staff in the design process.

Introduction

Healthcare services are currently under digitisation transformation worldwide. Swedish healthcare organisations have been encouraged by the Government (Ministry of Health and Social Affairs, 2010) to implement information technology (IT) to increase the accessibility and
effectiveness of healthcare services, for example. The on-going large-scale digitisation of Swedish healthcare services has created a need for new work practices. A national report (Stjernstedt, 2016) states that the opportunities for improvements that digitisation could offer to both patients and healthcare organisations in Sweden are not being utilised.

In Swedish home healthcare, healthcare providers are trying to find new ways of cooperating when the care process involves different healthcare organisations. In most cases, home care and hospital care organisations work together in the patient’s home. To ensure successful collaboration across organisational boundaries, it is essential that there are common tools, i.e. digitised tools as IT and a shared understanding of the necessary work practices involved. New ways of working with common decision support systems (DSS) and other digitised tools are expected to assist this collaboration. A common understanding of and approach to structural assessment could enhance the way that DSS are worked within each organisation, which in turn could support a more accessible, efficient and safe way of working together across the care organisations (Kihlgren, Svensson, Lovbrand, Gifford, & Adolfsson, 2016). This study focuses on the implementation of a new DSS that is being introduced into home healthcare as part of a new way of collaborating between different healthcare organisations. The DSS is intended to be used when home healthcare nurses encounter a rapid deterioration of a patient’s health at home and thus need to make an immediate decision about whether to send the patient to hospital or continue with healthcare provision in the home. In its current state, the DSS is paper-based. However, the intention is that it will be digitised in the near future. The opportunity to study what was essentially an implementation of a paper-based prototype of the DSS, rather than the digitised version, has helped to highlight the importance of the actual content of support systems and work practice-based cooperation within the organisation. During the implementation of a new support system that transforms healthcare organisations such as the DSS – whether paper-based or digital – the adjustment of everyday work practices and the adaptation of the new support system to fit the actual work context into which it is being implemented are essential. In this study, the paper-based DSS is seen as part of the process of digitisation of assisting tools in home care services and of the transformation of Swedish healthcare services.

The DSS is a tool for assisting home care nurses in determining the optimal level of care for older people. It is based on Rapid Emergency Triage and Treatment System (Kihlgren et al., 2016). Kihlgren et al. (2016) found that working with the DSS results in the most appropriate transfer of older people with deteriorating health from their homes to the emergency department. However, knowledge about the use of pre-hospital assessment tools such as DSS is still considered to be insufficient among home care nurses.

Although the transformation of healthcare organisations aims to provide accessible and efficient care, the implementation of health information technology often encounters barriers.

For example, organisational thresholds such as organisational structure, information and decisions are highlighted as barriers. There is a relation between these barriers, which means that the implementation needs to be understood from different perspectives. When health IT is operating as a tool that aids cooperation between healthcare organisations, staff need to feel that they can trust the tools and the information they comprise (Lluch, 2011). In many instances, new ways of working have not been harmonised with organisational cultures, the values of the work context and routines (Fagerstrom, Turesson, Axelsson, & Nilsson, 2016). According to Fagerstrom et al. (2016), nursing practice is influenced by the role of digitised tools, i.e. information and communication technology in patient care, working conditions, and nurses’ professional identity and continuous professional development. Elwyn et al. (2013) studied if and how a decision support was successfully implemented in healthcare organisation. In their systematic review, they identified aspects that interfere with implementation; these include being unable to use the decision support as a part of everyday work practice and the need for instructions regarding the use of the decision support. Leaders’
actions and their knowledge of IT projects, are examples of the impact of how IT is adopted in healthcare organisations (Ingebrigtsen et al., 2014). Kawamoto, Houlihan, Balas, and Lobach (2005) show that a DSS can improve healthcare services if for example it is part of work and is at hand at the time when a decision needs to be made. According to Kortteisto, Komulainen, Makela, Kunnamo, and Kaila (2012) the basic functionality of a DSS will not, on its own, make people use it. Clinical support systems also need to be comprehended as useful in clinical practices. Hence, we argue that it is important to gain deeper insight into how DSS can be integrated into practices and workflows stepwise, allowing for mutual adaptation between the system and the work practices it is intended to support and enhance. In this case, we have studied how a paper-based DSS – a precursor to and part of the process of a digitised DSS – is integrated, used and understood by healthcare staff in home care. The aim of this study is to describe home healthcare nurses’ experiences of the implementation and use of a new DSS, with a focus on how it influences decision-making in everyday work practice.

Method

Study design

To describe nurses’ experiences, a qualitative approach was used in this study. In order to include diverse subjective understandings of the reality (Polit & Beck, 2012), experiences of the implementation of a paper-based DSS were collected from focus group interviews with open-ended questions. The study followed the guidelines presented in the Consolidated Criteria for Reporting Qualitative Research (COREQ) framework (Tong, Sainsbury, & Craig, 2007).

Context

This study focuses on the home care organisations in a county in the south of Sweden. The home care DSS mentioned above was implemented during 2014 and 2015 in five municipalities in a county in the south of Sweden to assist nurses’ decisions when encountering the rapid deterioration of a patient’s health at home. The study focuses on municipal home care to determine whether the DSS was perceived as supportive. Interviews were conducted between August 2015 and April 2016 at three different home care workplaces in two municipalities where the DSS had been implemented and was in use.

The decision support system

The DSS includes four pages of statements. The home care nurse must answer ‘yes’ or ‘no’ to each statement. The ‘no’ column is colored red while the ‘yes’ column is green. If the home care nurse fills in any ‘no’ answers, even if there is only one ‘no’ and all the other answers are ‘yes’, the DSS recommends that the nurse transfer the person to the emergency department. The first three pages include a checklist concerning vital parameters (e.g. heart rate and oxygen saturation) and common symptoms (e.g. fever). The last page provides information about how to report to the emergency department (Situation, Background, Assessment and Recommendation [SBAR]) and includes a text box for the nurse’s notes (Kihlgren et al., 2016). The DSS is paper-based. Nurses were also offered the opportunity to test the DSS in a digitised form as part of an ongoing transformation process.

Sample

The participating nurses worked as home healthcare nurses in the municipalities included in this study. They had various work shifts that covered day and night. The operation managers of the
Data collection

Three focus group interviews were conducted with the aims of encouraging interaction between respondents and collecting shared experiences (McLafferty, 2004). Each focus group consisted of two home care nurses. In all, six home care nurses participated in the study. Before the interviews, open-ended questions were organised in themes to provide a basic structure for the interviews (Dicicco-Bloom & Crabtree, 2006). With a view to the aim of the study, the interview guide covered three topics: (1) the DSS, (2) the use of the DSS in home care and (3) the relationship between the DSS and nursing work practice. In the three topics of the interview, open-ended questions such as ‘Please tell us about a situation … ’ were asked. Follow-up questions like ‘What do you mean when you say … ’, and ‘In what way … ’ were used during the interviews. The interviews were led by two moderators (the authors), who were in charge of asking questions and taking field notes. Each interview lasted for just over one hour and was recorded and transcribed verbatim.

Analysis

The data was thematically analysed, drawing from Burnard’s method for content analysis (Burnard, 1991). The recorded interviews were listened to several times. The transcribed interviews and field notes were read individually by the authors. With the aim of the study in mind, notes were written down in the margin of the interview text and field notes. Notes were distributed among the researchers and duplicates were erased. Codes were identified in the text and colored; these were compared with the original transcribed texts and field notes to ascertain whether the context was maintained by the codes. After being put into a matrix, the codes were compared and ordered into subcategories. Similar subcategories were combined and put together into all-embracing categories. The moderators reread the transcribed interviews to ensure that the categories and subcategories reflected what had been said in the interviews (Burnard, 1991). Quotations were used to highlight the essence of the data and to achieve transparency in the interpretation of the data (Polit & Beck, 2012).

Findings

Through the analysis, we arrived at two main categories, each with three subcategories (see Table 1).

Professional adaptation

The DSS is a support tool that nurses were expected to use, and did use, when they encountered an elderly patient with deteriorating health at home. The nurses viewed the DSS as a tool that

---

home care units in the municipalities were contacted and informed about the study. The managers forwarded information to staff members and later discussed the interviews with them. Six nurses agreed to participate in the interviews. Together with nurses, managers arranged the time and place for the interviews that suited the nurses and the work of the home care units. Information letters about the study, including information about informed consent, were distributed. Before the interviews were carried out, the respondents were also informed orally about the study, confidentiality and the voluntary nature of participation. This study follows the principles outlined in the Declaration of Helsinki (2004). The project was approved by the Ethics Committee at Uppsala University, 2013 (Registration number 2013:523).
supported well-grounded structural assessments determining the optimal level of care for a patient, particularly when nurses were not familiar with patients’ health histories. Nurses simultaneously experienced the standardised DSS as not always being compatible with work practices and the norms of the organisation. In assessing and deciding on the best course of action concerning a patient whose health was deteriorating, the nurses used both the new standardised DSS and their own established support system: their ‘clinical eye’. In this study, ‘clinical eye’ is understood as the comprehensive professional experience that nurses’ use when they meet patients.

**Using the DSS for other purposes**

This subcategory includes how a DSS might be used in ways other than those intended, when it did not fit the routines of the home care organisation or when nurses were not well informed about the DSS by the organisation.

Nurses stated that they had received little information about the implementation of the DSS and why they ought to use it in their work. Lack of sufficient information caused some confusion about why the DSS was used. One nurse had used the DSS once after its implementation, and one nurse had used it during several night shifts. Because of the structure of the DSS and the logic behind the structure, home care nurses perceived the DSS as not always suited for supporting their ‘clinical eye’ and the established ways of working in home care nursing. Instead of using the DSS to support a decision to call an ambulance, nurses sometimes used the support system to support the decision not to call an ambulance, thus avoid unnecessary referrals. In such situations, the DSS was used as a guide to make the patient feel safe in their home environment, and to reassure the patient’s family members that continued care in the home was the best option:

> I know that one of the night nurses used the DSS. Members of the family were there, so the nurse showed them that this [the completed DSS check-list concerning vital parameters and symptoms, authors’ comment] meant that the patient does not need to go to the hospital because the parameters are good […] and then the members of the family quite understood how the nurse was thinking …. (Respondent 2)

Nurses perceived the DSS as a supportive tool in the interaction with the patient and the family and for determining that the patient’s health situation was stable.

**Combining everyday work with the DSS**

This subcategory included the experiences of working with parallel support systems (the DSS and the ‘clinical eye’). These experiences showed this to be difficult and a cause of disruption to the workflow. Feelings of not understanding the purpose and use of a standardised DSS sometime caused frustration.
As the DSS is paper-based, some home care nurses printed copies of it and kept these in their private backpack during working hours. If the nurses forgot the support system, they trusted their ‘clinical eye’ when they encountered a person with deteriorating health at home. When the situation was urgent home care nurses said that they did not have time to take out and fill in the four-page DSS. If an ambulance took the DSS to the hospital, the nurse would have to write down actions that were carried out on a piece of paper as a template for the nurse’s documentation in the electronic health record when the nurse got back to the office. Information about how and what to do with the information in the DSS was experienced as not yet decided on an organisational level:

I know that some [nurses] journalise the notes, or they transfer their written notes [to the patient record]. It has not yet been decided, but the information [the DSS, authors’ comment] is a patient record document, is it not? It includes information about the patient and patient identification. (Respondent 2)

To be even more prepared for encountering a patient with deteriorating health at home, the home care nurses stated that assistant nurses in home care also needed a DSS:

This would fit our organisation. Then we would get the parameters earlier from the assistant nurse … before they call us they can check pulse, blood pressure and take the patient’s temperature’. (Respondent 5)

The nurses believed that the DSS would assist the assistant nurses in their first examination of the patient and help them to know which parameters are of vital importance.

**Designing decision to the support tool**

This subcategory covered experiences of how a decision needed to be designed to match the questions of the DSS. The nurses found that there was discrepancy between how they experienced the situation and how the support guided their decision. When home care nurses described the DSS, they experienced uncertainty about whether to call an ambulance. The nurses described most of the patients living at home and receiving home care as frail, which is a positive answer on the DSS and almost every patient would be sent to the hospital if the DSS was being used correctly. Aligning their decisions with the support system sometimes caused stress:

When you are stressed, when you meet the patient having difficult breathing – well, then I do not fill in an answer to every question. (Respondent 2)

Experiences of being uncertain called for experience and a parallel decision by the nurse on how to manage the patient at home. Nurses had to adapt their answers so that the DSS agreed with their decisions about whether to call an ambulance.

**Deep loyalty**

Although the design of the DSS did not always harmonise with the way that nurses are taught to make a decision when they meet a person with deteriorating health at home, they did use the DSS. The DSS guided the nurses in their decisions, but at the same time, it was experienced as a tool that gave little support for working across organisations. Although the structure of the support system was experienced as a system that was parallel to the nurse’s ‘clinical eye’ and did not match or complement what they had been taught in their nursing education, nurses were devoted to their duty to use the DSS.
Using a DSS that brings insufficient support

This subcategory covered the experiences of using a support system even though it did not always guide nurses’ work in home care. The nurses observed that the DSS was used more frequently during night shifts. During day shifts in patients’ homes, the nurses used other support systems when making decisions to transfer patients to the emergency department. The nurses followed the organisation’s decision to use the DSS, although it was not always experienced as intended – as a coherent tool for caring for a patient with deteriorating health in a stressful situation:

When you are stressed, you find it difficult to fill it [the DSS] in. It was a lot of reading to do. You see what I mean? It is difficult to fill in, or it is a lot to fill in. (Respondent 1)

When the situation was not life-threatening and the DSS recommended that a home care nurse transfer a person to the emergency department, the nurse would often call the primary health care physician for consultation. Although the DSS is a newly implemented way of working across healthcare services, the physician often did not know about it. The nurses had to explain it to the physician or else ignore the DSS and recount the situation once again. In cases where patients were very ill and the DSS told the nurses to call the emergency department and they did, the emergency staff often did not know what to do with the completed DSS. Often, the emergency staff took it. Home care nurses did not know who ultimately received the completed DSS and how it was used thereafter. Not knowing the organisational owner, the role of the DSS and what good the completed support system would do in a coherent caring process was experienced as unsatisfying: ‘What will happen next?’ (Respondent 1).

The completed DSS should accompany the patient. The vital parameters must then be completed again in the electronic healthcare record back at the nurse’s office. Other than mobile phones, the nurses did not carry any electronic devices, such as iPads on their visits to patients’ homes. Due to the insufficient network connection in the patient’s homes, in combination with firewall regulations in the healthcare organisation, nurses could not write directly in the electronic healthcare record which caused more work for them.

Making your decision alone despite the DSS

This subcategory includes experiences of working alone in vulnerable situations in home care. When the home-help service needed assistance they called the home care nurse. The nurse then went to the patient for a medical examination. Although the DSS was experienced as a guide when making decisions, home care nurses concluded that the final decision whether to call the emergency department was their decision alone:

It is all about me, my personality and my experience […] I am taking the decision. (Respondent 6)

Home care nurses worked in the city and in rural areas of the municipality. Sometimes they went in pairs when they visited very ill patients at home, but often they went alone on house calls.

Using an inconsistent support tool

This subcategory included experiences of not understanding the logic of a support system for decisions. During the interviews, the home care nurses browsed through the DSS. The order of the vital parameters and the questions did not align with the way home care nurses worked or with their understanding of how words and concepts ought to be presented. Consequently, home care nurses had to search in the DSS to find the right words and concepts. This searching
was experienced as time-consuming. In the support system, concepts were presented using medical language. One of the nurses found this language somewhat misleading because they did not use medical terms when consulting patients or talking to colleagues in home care nursing. Home care nurses explained that the medical terms used could be misinterpreted, particularly in stressful situations when patients are very ill. One nurse was worried about how the misinterpretation of medical concepts may affect the evaluation of the person:

The risk is that you might become unsure in your evaluation because you do not understand it. Then you might skip it instead. (Respondent 3)

Home care nurses had to sign the DSS and were sometimes concerned about what they were responsible for because of the design of the support system and the lack of awareness of the support system among other healthcare staff treating the patient.

Discussion

There are plans to digitise the DSS, and this study focuses on the period before this happens. This focus reveals the importance of a support system and its content being introduced to its users but also support work in order to be used. As Cresswell, Majeed, Bates, and Sheikh (2012) state, it is important that a digitised DSS meets the requirements of the staff who will use it and be engaged in it in everyday work.

This study implies that although a DSS supports home care nurses in their decision to determine the optimal level of care for patients, it is difficult to include all factors that influence nurses’ decision-making in one DSS. Shapiro et al.’s (2006) study shows that the variety of methods used to train the ‘clinical eye’ in medical education may help the practitioner to make a decision that is based on aspects other than those that can simply be seen. In one study, experience was found to be an element among several elements influencing a nurse’s decision (Traynor, Boland, & Buus, 2010). Hoffman, Donoghue, and Duffield (2004) show how nurses estimated the profession as nurse influence how decision-making may change. The implemented standardisation of a decision does not cover all factors that may have an impact on nurses’ decisions in work practice. Although nurses found the DSS valuable, nurses sometimes doubted it and did not always trust their decisions. Despite uncertainty and the experience of working in parallel support systems, nurses were loyal to the DSS. A study (Merrick, Fry, Duffield, & Stasa, 2015) identified that nurses take part in the decision-making process regarding patients in healthcare organisations and through this process founded professional relations with staff members and patients. In the reported study, this means that parallel decision-making systems and an uncertainty about decisions made may influence the nurse’s role in the decision-making process and their relation to patients and other professionals. Although the DSS assists nurses in their decision-making, nurses need to adapt to the support system. The findings in the reported study emphasise that the content of the DSS needs to be understood to be useful. Whether the DSS is paper-based or digitised appears to make no difference. Pai and Huang (2011) indicate that ease to use and the experience of usefulness influence the intention to use digitised tools in healthcare organisations. Huryk (2010) found that nurses who participated in the design of healthcare digitisation admitted to it if the digitisation supports nurses’ work. The reported study implies that nurses’ loyalty could be interpreted as playing a mediating role in the digitisation of healthcare organisations. Nurses facilitate communication between the DSS and the organisation, making to make work practice run smoothly in the organisation and moderating attitudes towards the support system. Using the DSS for other purposes and making suggestions for its improvement may be interpreted as a way of incorporating usefulness and workflow for the nursing practice and for the organisation.
The implementation and use of a DSS is influenced by many factors. Using implementation theory as a foundation for analysis, Carlfjord, Lindberg, Bendtsen, Nilsen, and Andersson (2010) identified factors, such as dissemination as parts of the adoption of a digitised innovation in a project in a healthcare organisation. Randell and Dowding (2010) show how committed staff can influence the use when a DSS is to be implemented. In the reported study, nurses experienced that the DSS was not known by other professions and units although it was supposed to have been used as part of a new way of working. There may be various reasons why nurses had the experience that there was a lack of knowledge about the DSS and its use in some organisations within the collaboration. For example, organisations may focus on different factors in the implementation of the DSS and of those organisations collaborating in the use of the DSS. This might influence the adoption of the DSS (Carlfjord et al., 2010). Håland and Osmundsen (2015) state that factors in the organisation and between individuals are influencing how collaborations between healthcare organisations progress. This may indicate that if a new way of working between organisations is not known to all professionals and units, different organisations within the collaboration may focus on different influencing factors. In the various focuses on factors, this study implies that nurses become the mediators.

With several factors influencing nurses’ decision-making process, the collaboration and the implementation of innovations, the healthcare organisation needs to be ready for the changes that accompany the transformation of work. Shea, Jacobs, Esserman, Bruce, and Weiner (2014) present findings originating from Weiner’s theory about organisational change. Their study of organisational readiness for change confirms the theory’s parts of organisational readiness. The presented study shows that the healthcare organisation was perhaps not ready for change when implementing the DSS. Not all staff in cooperating organisations knew about the DSS. The nurses then had to adapt their profession to implement the content of the DSS on their own. Nurses’ loyalty towards their profession, patients and the organisation may be identified as factors that determine their role in change despite the absent of organisational support or commitment in this regard change that the organisation may not be ready for. This study suggests that nurses undertook two roles: they operated the support system and they acted as a collaborator in the healthcare organisation.

The study includes a relatively small sample of home healthcare nurses in two municipalities. However, the two municipalities have a common structure for referrals and they are located in the same county council, which yields a similar approach to transferring patients to different care levels. The sampling procedure was purposively conducted. The participants represented both day and night staff and all nurses had received similar information about the group interviews and had used the DSS in the period just before this study. The participants were all women. Although a small sample, the trustworthiness of the study (Lincoln & Guba, 1985) is strengthened by its introduction of the context and the methodological approach and thorough presentation in this study. Also, presenting respondents’ quotations illustrates the categories identified in the authors’ analysis of data. As researchers, we were aware of being a part of the context and we took this into account through a process of reflection on personal bias.

The interview group members were well known to each other and already established power relationships are difficult to control (Reed & Payton, 1997). One advantage of focus group interviews is the ability to use the participants’ interactions to gather rich data (Webb & Kevern, 2000), as they reflect on their experiences during the discussion (Reed & Payton, 1997). The small number of participants in the group interview created a relaxing and open atmosphere and fostered deep discussion and reflection among the participants. Having few participants in each group reduces the risk of losing data due to the interrupted discussion in the group or the development of parallel discussions in group interviews (Twinn, 1998). The permissive and deep discussions may encourage participants to feel comfortable talking about their experiences of the DSS. To gain
access to the context, operation managers participated in the sample process. They introduced the study to their staff members. This procedure may have influenced the findings of this study. However, the deep discussions during the interviews confirm that the participants felt confident in sharing their experiences. When analysing and interpreting text, elements of subjectivity are always present, which carries at risk that trustworthiness will not be ensured. According to Morrison-Beedy, Côté-Arsenault, and Fischbeck Feinstein (2001), scientific rigour is crucial in group interviews. The COREQ checklist (Tong et al., 2007) was used to ensure that methodological information was included in the study. To ensure consistency, both authors participated throughout the whole research process.

**Conclusion**

The transformation of work in a healthcare organisation includes various aspects that need to be highlighted for the organisation when – in this case a DSS – is to be used in everyday work. This study contributes to the awareness of those aspects that needs to be considered when implementing a DSS in a healthcare organisation before it is digitised. If the organisation does not consider these aspects, nurses may adopt a role as mediator when decision supports are implemented as part of the digitising healthcare process and as a part of cooperation between healthcare organisations.

**Acknowledgements**

The authors wish to thank the participants for sharing their experiences. The study is part of a project and cooperation between Örebro University and Blekinge Center of Competence (Blekinge county council). The authors acknowledge Prof. Sara Eriksén for constructive feedback on the manuscript and Lil Carlheden Ottosson for helpful feedback on the English language. The authors also wish to thank Linnaeus University and The Scientific Committee of Blekinge County Council’s Research and Development Foundation for supporting this study.

**Funding**

This study was supported by The Scientific Committee of Blekinge County Council’s Research and Development Foundation, Blekinge County Council.

**References**

Burnard, P. (1991). A method of analysing interview transcripts in qualitative research. *Nurse Education Today, 11*(6), 461–466.

Carlfdorf, S., Lindberg, M., Bendtsen, P., Nilsen, P., & Andersson, A. (2010). Key factors influencing adoption of an innovation in primary health care: A qualitative study based on implementation theory. *BMC Family Practice, 11*, 60. doi:10.1186/1471-2296-11-60

Cresswell, K., Majeed, A., Bates, D., & Sheikh, A. (2012). Computerized decision support systems for healthcare professionals: An interpretive review. *Informatics in Primary Care, 20*, 115–128.

Dicicco-Bloom, B., & Crabtree, B. (2006). Making sense of qualitative research. *Medical Education, 40*, 314–321.

Elwyn, G., Scholl, I., Tietbohl, C., Mann, M., Edwards, A. G., Clay, C., … Frosch, D. L. (2013). "Many miles to go ... ": A systematic review of the implementation of patient decision support interventions into routine clinical practice. *BMC Medical Informatics and Decision Making, 13*(Suppl. 2), S14. doi:10.1186/1472-6947-13-S2-S14

Fagerstrom, C., Tuveson, H., Axelsson, L., & Nilsson, L. (2016). The role of ICT in nursing practice: An integrative literature review of the Swedish context. *Scandinavian Journal of Caring Sciences, doi:10.1111/scs.12370*

Håland, E., & Osmundsen, T. C. (2015). Establishing and sustaining collaboration across organizational boundaries within healthcare. *International Journal of Integrated Care, 15*(5).
Hoffman, K., Donoghue, J., & Duffield, C. (2004). Decision-making in clinical nursing: Investigating contributing factors. *Journal of Advanced Nursing*, 45(1), 53–62.

Huryk, L. A. (2010). Factors influencing nurses’ attitudes towards healthcare information technology. *Journal of Nursing Management*, 18(5), 606–612. doi:10.1111/j.1365-2834.2010.01084.x

Ingebrigsten, T., Georgiou, A., Clay-Williams, R., Magrabi, F., Hordern, A., Prgomet, M., ... Braithwaite, J. (2014). The impact of clinical leadership on health information technology adoption: Systematic review. *International Journal of Medical Informatics*, 83(6), 393–405. doi:10.1016/j.ijmedinf.2014.02.005

Kawamoto, K., Houlihan, C. A., Balas, E. A., & Lobach, D. F. (2005). Improving clinical practice using clinical decision support systems: A systematic review of trials to identify features critical to success. *BMJ*, 330(7494), 765. doi:10.1136/bmj.38398.500764.8F

Kihlgren, A., Svensson, F., Lovbrand, C., Gifford, M., & Adolfsson, A. (2016). A decision support system (DSS) for municipal nurses encountering health deterioration among older people. *BMC Nursing*, *15*, 63. doi:10.1186/s12912-016-0184-0

Kortteisto, T., Komulainen, J., Makela, M., Kunnamo, I., & Kaila, M. (2012). Clinical decision support must be useful, functional is not enough: A qualitative study of computer-based clinical decision support in primary care. *BMJ Health Services Research*, 12, 349. doi:10.1186/1472-6963-12-349

Lincoln, Y. S., & Guba, E. G. (1985). *Naturalist inquiry*. Newbury Park, CA: Sage.

Lluch, M. (2011). Healthcare professionals’ organisational barriers to health information technologies – A literature review. *International Journal of Medical Informatics*, 80(12), 849–862. doi:10.1016/j.ijmedinf.2011.09.005

McLafferty, I. (2004). Focus group interview as a data collecting strategy. *Journal of Advanced Nursing*, 48(2), 187–194. doi:10.1111/j.1365-2648.2004.03186.x

Merrick, E. T., Fry, M., Duffield, C., & Stasa, H. (2015). Trust and decision-making: How nurses in Australian general practice negotiate role limitations. *Collegian*, 22(2), 225–232.

The Ministry of Health and Social Affairs. (2010). *National eHealth – The strategy for accessible and secure information in health and social care*. Stockholm: The Ministry of Health and Social Affairs.

Morrison-Beedy, D., Côté-Arsenault, D., & Fischbeck Feinstein, N. (2001). Maximizing results with focus groups: Moderator and analysis issues. *Applied Nursing Research*, 14(1), 48–53.

Pai, F.-Y., & Huang, K.-I. (2011). Applying the technology acceptance model to the introduction of healthcare information systems. *Technological Forecasting and Social Change*, 78, 650–660.

Polit, D., & Beck, C. (2012). *Nursing research: generating and assessing evidence for nursing practice* (9th ed.). Philadelphia, PA: Lippincott Williams & Wilkins.

Randell, R., & Dowding, D. (2010). Organisational influences on nurses’ use of clinical decision support systems. *International Journal of Medical Informatics*, 79(6), 412–421. doi:10.1016/j.ijmedinf.2010.02.003

Reed, J., & Payton, V. R. (1997). Focus groups: Issues of analysis and interpretation. *Journal of Advanced Nursing*, 26, 765–771.

Shapiro, J., Rucker, L., & Beck, J. (2006). Training the clinical eye and mind: Using the arts to develop medical students’ observational and pattern recognition skills. *Medical Education*, 40(3), 263–268. doi:10.1111/j.1365-2929.2006.02389.x

Shea, C. M., Jacobs, S. R., Esserman, D. A., Bruce, K., & Weiner, B. J. (2014). Organizational readiness for implementing change: A psychometric assessment of a new measure. *Implementation Science*, 9, 7. doi:10.1186/1748-5908-9-7

Stjernstedt, G. (2016). Effective healthcare (In Swedish Effektiv vård) official reports of the Swedish government 2016:2. Stockholm: Swedish Government.

Tong, A., Sainsbury, P., & Craig, J. (2007). Consolidated criteria for reporting qualitative research (COREQ): A 32-item checklist for interviews and focus groups. *International Journal for Quality in Health Care*, 19(6), 349–357.

Traynor, M., Boland, M., & Buus, N. (2010). Autonomy, evidence and intuition: Nurses and decision-making. *Journal of Advanced Nursing*, 66(7), 1584–1591. doi:10.1111/j.1365-2648.2010.05317.x

Twinn, S. (1998). An analysis of the effectiveness of focus groups as a method of qualitative data collection with Chinese populations in nursing research. *Journal of Advanced Nursing*, 28(3), 654–661.

Webb, C., & Kevern, J. (2000). Focus groups as a research method: A critique of some aspects of their use in nursing research. *Journal of Advanced Nursing*, 33(6), 798–805.