Improving Handovers Between Hospitals and Primary Care: Implementation of E-Messages and the Importance of Training

Grete NETTELAND[1]

Sogn og Fjordane University College, Norway

Abstract. The transfer of information and responsibility for care of a patient from one healthcare provider to another is referred to as a handover. While some handovers are effective and achieve high quality communication, others represent a barrier to continuity of care. To increase the patient safety, Norway decided to replace handovers with an *electronic e-message system (EMS)*. This paper refers to a quantitative study of this implementation and examines the opinions of first-line leaders and nurses (N=108) on how organisational factors were taken into account and how the implementation might be improved. The findings indicate that such factors generally did not receive very much attention in the implementation of the EMS, and less for the nurses than for the first-line leaders. Particularly, the factor most prominently identified by both groups as warranted improvement, was the training.

Keywords. E-messaging, handover, implementation, training, organizational factors.

1. Introduction

Handovers are described as transfer of responsibility and accountability for patient care from one provider or team of providers to another [1]. They occur within and between organisations, and the communication takes place either face-to-face, by telephone, e-mail, fax or electronic messaging. The desired outcome is patient safety and a reduced number of failures. But handovers may also represent a barrier, or even worse, be a high-risk point in patient care [2, 3, 4]. Patient information might get lost, ignored or misinterpreted, treatment might be delayed and patients may die. In 2008, Norwegian health authorities, in line with national strategies, decided to develop an electronic-messaging system (EMS) that could make selected patient information available for all partners in the health and care sector, provide more efficient work and a safer continuity of care. Five years later, a set of standardised e-messages with content customized for the transition between hospitals and municipal healthcare was disseminated nationally [5]. The role of the nurses was to produce adequate and correct information in e-messages, transfer these messages to the next health provider, and, to control and read the content in the e-messages they received.

Despite this, there are still challenges in the handovers between hospitals and municipal healthcare. These are so far explained by 1) the lack of integration of e-messages into day-to-day work; 2) a general lack of ICT skills among the healthcare staff; 3) the functionality of the EMS; 4) the system's usefulness for different user groups; and, 5) the varying quality of the e-message content, sometimes being incorrect,

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[1] Corresponding Author: Grete Netteland, Dr. Polit. SFUC. E-mail: grete.netteland@hisf.no

incomplete, inconsistent or delayed [6, 7, 8]. It is further recognized that the perceived challenges might differ between nurses and FLLs and that e-messaging might affect the collaboration between different groups regarding tasks and responsibilities [3, 9]. Implementations of e-health systems have been assessed as demanding. The same seems to apply to the implementation of e-messaging. This paper will examine four organisational factors frequently mentioned in systematic reviews as being critical to ICT implementations in the healthcare sector [4, 10]: *information* (e.g. sense-making and the announcement of the project's importance, scope, progress, objectives and activities [2, 4, 11]); *involvement* (e.g. individual and collective involvement in planning and implementation, collective action and interaction [4, 10, 11]); *training* (e.g. adequate training of staff members and consistent use of the new system [4, 11]), and, *support* (e.g. skilled people that can assist when needed and follow-up from manager [8, 10]).

Because the e-message system is a new tool for handovers and interorganisational collaboration, this study is inspired by a sociotechnical perspective [12]. With this perspective as a departure point, the implementation and integration of the e-message system into different organisations will depend on the interaction among individuals and organisational as well as social and technological elements in local settings. This paper addresses how the organisations have prepared their nurses and FLLs for the organisational factors mentioned above, in implementing the e-messages, and how the implementation process might be improved.

2. Method

The study is based on an online survey conducted in a Norwegian county in spring 2014. Data were collected from 1) the nursing homes and home healthcare services in three municipalities selected as representatives of the three EHR systems in use in the county, and, 2) the three units in the main hospital with the highest rate of e-message exchange with municipalities. The survey took place four to five months after the e-message implementation in the respective units. Three sources formed the basis for the development of the questionnaire: Interviews with the project teams in the county hospital and in one municipality; careful examination of the national e-message program directive, national and regional implementation guidelines and national pilot reports [5, 6, 13]; and, research on handovers, implementations of e-health systems, and the introduction of e-messages in different contexts. Before the questionnaire was launched, it was sent for comments to two FLLs and two project leaders, asking them to involve one or two nurses. The final questionnaire, which had 35 questions for nurses and 41 (6 extra) for FLLs, included the following topics: demographics, ethics, organisational and implementational characteristics, experienced challenges, deviations and errors, perception of the implementation and the EMS, and suggestions for improvements. It was distributed via a link to nurses and leaders who were on duty in their respective units in a 24-hour period. The response rate was 93% for FLLs and 90% for nurses. Totally 93 nurses (4male) and 15 FLLs (1 male) responded. The responses to most of the questions involved rating on a six-point Likert scale (1 = to a very small extent; 6 = to a very large extent). Some questions permitted a binary choice in the response and a few required free responses. This paper is based on twelve items focusing on how the implementation had prepared the nurses and the FLLs for information, involvement, training and support; two items focusing on the participants' perception of how the national aims more efficient work and a safer continuity of care had been achieved; and, one open-ended

question dealing with how to improve the implementation. The latter responses were coded according to the items and organisational factors before the meaning was condensed [14]. All analyses were carried out using IBM SPSS ver. 23. The t-tests were carried out by conducting Student's t-test, which has a threshold of $p \leq 0.05$.

3. Results – Assessment of Organisational Factors

The main focus here is on 1) the descriptive differences in the organizational implementation data rated using a Likert scale, and 2) the responses from the open-ended question. The first results are split into two separate tables, both listing the mean values and standard deviations of the ratings for FLLs and nurses. For all variables the differences in mean values between FLLs and nurses are statistically significant ($p \leq 0.05$). While Table 1 describes variables related to the themes of *information* (the five columns to the left) and *involvement* (the remaining columns). Table 2 describes variables related to *training* (the four columns to the left) and *support* (the last column). Clear differences in mean values between FLLs and nurses are found for all variables in both tables, the clearest ones in Table 1 for variables characterised as *involvement* (2.15 and 2.07). Rather large differences of this kind, albeit smaller, were identified in the same table for *information-related* variables, where differences in mean values between the two groups ranged from 1.82 to 1.17, respectively. It should be noted that the mean values in Table 1 were higher for the FLLs (4.80 to 4.27) than for the nurses (3.63 to 2.12). The values of the nurse responses are more widely spread than the values of the FLL responses. Overall, Table 1 indicates that the FLLs considered that they were better informed about the project and more involved in the planning.

Table 1. Information and involvement – nurses (N) and first-line leaders (FLLs)

	Good information about the project		Necessary information about progress		Information about project goals		Information about success criteria		Introduced to ethical and security-related issues		Involved in the planning		Opportunity to influence the introduction	
	N	FLLs	N	FLLs	N	FLLs	N	FLLs	N	FLLs	N	FLLs	N	FLLs
Mean	3.63	4.80	3.62	4.80	3.53	4.73	3.14	4.73	2.71	4,53	2.26	4.33	2.12	4.27
Standard dev.	1.420	1.082	1.414	1.320	1.515	1.100	1.434	.884	1.571	.743	1.444	1.676	1.451	1.387

Table 2 focuses on the assessment of training and support. As in Table 1, the assessment ratings differ between the two groups, with a maximum difference between mean values of 1.51 for the variable *Sufficient time for testing*. The smallest difference in mean values is found for the variable *Relevant training* (1.04). Within each of the user groups, the mean values for training and support variables range from 3.69 to 2.89 for nurses and from 4.73 to 4.40 for FLLs. Compared with Table 1, the assessment across variables within each group is smoother. The spread within the different variables is also smaller. Both for nurses and FLLs, the lowest mean value was related to the variable *Sufficient time for testing* (2.89 and 4.40 respectively). On the other hand, the absolutely highest mean value for nurses was for the variable *Sufficient training* (3.5), for leaders the variable *Relevant training* (4.73). Considering all of the participants, Table 2 suggests that the leaders as a whole probably found the given training more adequate and more relevant than the nurses.

Table 2. Training and support- nurses (N) and first-line leaders (FLLs).

	Received sufficient training		Learnt to report mistakes and deviations		Relevant training		Sufficient time for testing		Sufficient support	
	N	FLLs	N	FLLs	N	FLLs	N	FLLs	N	FLLs
Mean	3.41	4.53	3.11	4.60	3.69	4.73	2.89	4.40	3.34	4.60
Standard dev.	1.446	1.187	1.710	.910	1.367	1.033	1.543	1.298	1.514	1.183

In the open-ended questions both user groups provided comments on the 12 variables (Table 3). Eight of the fifteen FLLs suggested improvements to the training, three of them to the information, three to the involvement and six to the support. The respective allocations of these factors among nurses were respectively 58, 22, 1 and 22. The factor most prominently identified by both groups as warranting improvement was the training especially in the nurse group where 62% of the nurses answered that more adequate and different training would improve the implementation. It should be noted that there was a significant medium correlation between *Training* (an aggregate of the four training-related variables) and *More efficient work* (r=0.475) as well as between *Training* and *Safer continuity of care* (r=0.419), assessed according to Cohen's rules of thumbs [15]. This will be addressed in later work. The nurses' attention to involvement was minimal.

Table 3. Distribution of the four organisational factors in open-ended questions - nurses (N) and first-line leaders (FLLs)

Respondents	n=	Information		Involvement		Training		Support	
N	93	22	24%	1	1%	58	62%	22	24%
FLLs	15	3	20%	3	20%	8	53%	6	40%

4. Discussion

Two particularly striking findings were made in this study, namely, the differences in mean values between how the FLLs and nurses assessed the organisational factors and the substantial need for training. The most marked differences were in the mean values for the variables addressing involvement and information, and some smaller, but still evident, for training- and support-related variables. This is interesting as it shows that, while the leaders are generally well informed about project progress, success criteria and so on, the nurses, who are expected to use the e-messages as part of their daily work, to a large extent lack the same information. Together with the low mean value of the nurse involvement, this might indicate that information and anchoring had stopped at the leader level, or, that the organisation had underestimated the needs in the nurse group. This happened although national and regional project guidelines underlined the need for organizational changes and suggested to arrange for satisfying training activities and user support adjusted to relevant target groups [6, 13]. At this stage, it remains unclear whether the implementation for the FLLs was better planned, or that this group received more information, training and support, or was more involved in the implementation process. Another explanation of the differences of opinion is that the two groups differ in their needs for training and information, among others, given their different occupational roles, as claimed by McGinn et al. [10]. It is also interesting that, despite mean values for training and support for nurses lying in the middle of the scale and being higher than the corresponding levels for information and involvement, the poor quality of the training was the main focus of comments in the open-ended responses. Some examples: more

individual and collective training before, during and after the implementation, more information about how to use the different e-messages, and the lack of opportunities for real time testing across collaborating organisations. This detailed description of required types of training, gives a valuable contribution to future training programmes, since these issues often are discussed superficially in the literature [11]. The identified correlations between training and the two national aims, more efficient work and a safer continuity of care, are also interesting. Suggestions for improvement also came from leaders, but these were less detailed about exactly what should be done. A few of the nurses also requested higher information quality in the received e-messages, which supports Bjørlo et al.' finding [8]. Overall, the low mean values for the organisational variables in the nurse group and the numerous requests and suggestions for improvement in this study, might indicate that there is plenty of room for improvement in the implementation of e-messaging.

5. Conclusion

The findings indicate that organizational factors and in particular training should receive more attention when e-messages are implemented across administrative levels. For future implementations[2], a more detailed and targeted training programme should be developed taking into account 1) that nurses and FLLs might assess the organisational factors differently, and, 2) that actors in collaborating organizations should be involved.

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