

# Handover training: does one size fit all? The merits of mass customisation

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**Handover training: Does one size fit all? The merits of mass customization**

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## **Abstract**

### **Background**

Training plays an important role in improving handovers. However, the content and delivery of handover training are only superficially examined and poorly described in literature. The aim of this study is to formulate recommendations for an effective training in handover and to examine whether standardization is a viable solution.

### **Methods**

A training needs analysis was conducted by means of a questionnaire, which was filled out by 96 healthcare professionals in primary and secondary care in the Netherlands, Spain, Sweden, and Poland. Preferences and recommendations regarding training delivery aspects and training topics that should be included in a training for handover were measured.

### **Results**

The majority of the participants recommended to provide a short conventional training with practical assignments to a small, multidisciplinary group. Formal examination, e-learning and self-study were not favoured. Recommended training topics were: communication skills, standardized procedures, knowing what to hand over, alertness to vulnerable patient groups, and awareness of responsibility. Small differences between countries pertain to suggested solutions to handover problems, such as reducing the time interval between discharge and discharge letter (The Netherlands), ensure information is handed over at all (Poland), and more standardized procedures and information systems (Sweden and Spain).

### **Conclusions**

The idea of a completely standardized handover training is not in line with the identified differences in preferences and recommendations between different handover

stakeholders. Instead mass customization of training in which a generic training can easily be adapted to the trainees' needs, based on examinations of, for example, their preferences or identified handover problems and solutions, is a more promising approach to handover training.

## **INTRODUCTION**

During handover, in this article described as the process during which a patient is transferred from the general practitioner or primary care to hospital or secondary care and vice versa, responsibility for the patient is handed over from one caregiver to another. This discontinuity of care can lead, if not done effectively and timely, to severe adverse events [1-2]. In literature it is regularly argued that standardization of the handover process and improvement of the quality of communication skills and attitudes of healthcare professionals can help to decrease the negative consequences of this discontinuity of care [3-6]. This requires not only an effective implementation strategy but also appropriate training to assure effective use of standardized tools, procedures and communication skills [7]. Often, this training can be standardized, which minimizes costs and design efforts.

However, a standardized training might undermine the training needs of the trainees and may be less effective than a customized training [8]. That is, if the content of a standardized training does not match the trainees' training needs, they will be less motivated and willing to engage in the training and have difficulties to transfer what is learned during training to the workplace [9-10]. The challenge is to design a standardized training that requires only minimal efforts to match trainees' needs. This is called mass customization. In mass customization individually designed trainings are based on a generic training design that can easily be customized to each organization by exchanging some aspects of the training [11]. Mass customization of handover training can be a promising approach to develop an effective handover training with little effort and low costs.

To enable mass customization insight in generic elements of a handover training and training needs of stakeholders in handover is needed. Unfortunately, although many

empirical studies on patient handover improvement by means of educational solutions exist, they only give little insight in the actual content and design of the handover and training delivery aspects are discussed superficially [1, 4, 7, 12-14]. This hinders deduction of guidelines for effective training in handover from these studies. The aim of this study is to formulate recommendations for an effective training in handover, based on a training needs analysis with stakeholders for different European countries [15]. In addition, it is examination to what degree standardization is a viable solution for effective handover training.

## **METHODS**

### **Study population**

The ninety-six participants were selected from primary and secondary care teams in the Netherlands (n=23), Spain (n=28), Sweden (n=23), and Poland (n=22). The clinical focus in these countries was respectively general medical care, minority groups, emergency and geriatrics. Participants were included based on their hands-on experience with handovers or involvement in improving handover in their organization. Sampling was conducted in order to ensure that the study population represented both seniors and juniors and an almost equal numbers of nurses and doctors. Table 1 provides an overview of characteristics of the study population. Prior to the study ethics approval was obtained from the organizations the participants worked. Participants were informed on the aim of the questionnaire and that data would be analysed anonymously.

\*\*\*INSERT TABLE 1 ABOUT HERE\*\*\*

### **Training needs analysis**

A training needs analysis was conducted to gain more insight in the preferences and needs of various handover stakeholders across Europe. A training needs analysis

encompasses the examination of the aim, the content, audience and delivery of a training. In addition it examines the conditions and prerequisites that affect the transfer of training from the training site to the workplace [16-19]. The needs analysis was conducted by means of a questionnaire.

### **Training needs analysis questionnaire**

A training needs questionnaire was composed by the authors and piloted with 10 primary and secondary care professionals. After some minor revisions, mainly concerning language issues, the questionnaire was translated into the mother tongue of the participants. Participants were invited personally or via e-mail to complete the questionnaire within one week. The questionnaire addressed five topics: satisfaction with current handover practices, suggestions for improvement of handovers, training topics, training delivery and factors influencing the success of a training. First participants were asked to indicate whether they were satisfied (i.e., yes/no) with the current handover practices in their organizations. Second, they were asked and to provide any suggestions for improvement of handovers (i.e., open question).

With respect to the third topic, participants were asked to rate on a scale from 1 to 4 (1 = very important, 4 = very unimportant) how important they thought it would be to train the following training topics during a handover training: standardized handover procedures, use of tools, communication skills, responsibility, becoming aware of patients at risk during handover, and information to hand over. These training topics were derived from a review of studies concerning the facilitators and barriers of effective handover [20-21]. In addition participants were invited to mention any other training topic they thought should be part of a handover training.

Regarding the fourth topic, participants were asked to indicate from a list of options what they would recommend regarding the delivery aspects of the training. The

following options were provided based on training needs analysis literature [18]: (a) the duration of training should be 4 hours/1 day/2 days, (b) the training should be a small face-to-face meeting/a lecture/e-learning/learning on the job, (c) the group of trainees should be multidisciplinary/unidisciplinary, (d) assessment should be informal with practical assignments during training/formal with an examination.

With respect to the fifth and final topic, participants were given an open question asking to indicate, based on prior experience with medical training, what factors positively affect the success of a training.

### **Statistical analysis**

The answers to the closed questions were analysed by a one-way ANOVA. The question on recommendations for delivery of the training was analysed with descriptive analysis, because it allowed participants to select more than one option. Finally, the answers to the open questions were first categorized in themes by one author (WK) using the open sources software Weft QDA [22]. Next, member check was conducted by two authors (MVK & HB) to extract the final set of categories.

## **RESULTS**

The results are presented first in terms of agreement and next in terms of differences between stakeholders regarding the answers to the questionnaire. In this way it is possible to identify what aspects of a handover training can be standardized and what parts should be customized.

### **Agreement between stakeholders**

Of all participants 60 % (n = 58), appeared not to be satisfied with the current handover practices in their organizations. Suggestions for improvement of handovers frequently mentioned by all participants pertained to (a) improvement of the quality of the information that is handed over, (b) increasing contact between stakeholders of

handover, (c) standardization of handover procedures, and (d) using other artefacts or tools during handover.

The ratings of the suggested potential training topics are presented in Table 2. It appears that all participants considered it *very* important to address the following topics during handover training: (a) alertness to vulnerable patient groups, (b) communication skills, (c) knowing what to hand over, and (d) awareness of being responsible for the patient's well-being. The use of tools and standardized procedures were considered slightly less important training topics.

\*\*\*INSERT TABLE 2 ABOUT HERE \*\*\*

Table 3 provides the main findings of the recommendations of the training delivery aspects. The majority of the participants prefers a training of 4 to 8 hours. A longer training duration is not perceived as desirable. Regarding the group of trainees, participants have a strong preference for training in small multidisciplinary groups (8-10 participants). There is also a strong preference for conventional training sessions and practical assignments during the training. The participants only incidentally recommended self-study and e-learning. The same applied to formal examination at the end of the training

\*\*\*INSERT TABLE 3 ABOUT HERE\*\*\*

Finally, the factors that were perceived to influence the success of a handover training could be grouped into the following five categories: promoting participation, ensuring the transfer of what is learned during training to the workplace, characteristics of the trainer, characteristics of the trainee, and the delivery of the training.

Table 4 provides an overview of these categories and an example per category.

### **Differences between stakeholders**

It appeared that a higher number of participants who work in primary care mention to be less satisfied (78 % of the nurses, n=21; 67 % of the doctors, n=14) with the current handover practices in their organization, than their colleagues in secondary care (50% of the nurses, n=12; 46% of the doctors, n=11). On country level, more than half of the Spanish participants (57%, n=16) were satisfied with the current handover practices, whereas only a small number of participants from the Netherlands (30%, n=7), Sweden (35%, n=8) and Poland (32%, n=7) were satisfied.

The suggestions for improving handover practices also demonstrate some differences between countries. It appeared that participants in each country mention handover training topics, not mentioned by participants from other countries. The Dutch healthcare professionals frequently suggested reducing the time interval between the patient's discharge and receiving the discharge letter or any feedback from secondary care. The Polish healthcare professionals proposed to tackle the problem of receiving incomplete or no information at all after referrals or discharges. Finally, the Swedish and Spanish healthcare professionals both emphasized the need for standardized procedures and the use of compatible, improved information systems.

Also the ratings of potential training topics showed some country-specific patterns. The Dutch participants perceived training in the use of tools significantly less important than the participants from the other countries ( $F = 12.8$ ,  $MSe = 3.78$ ,  $p = .000$ ). In addition, the Polish participants found it significantly less important to train what kind of information should be handed over, than the participants from Sweden or Spain ( $F = 4.2$ ,  $MSe = .90$ ,  $p = .000$ ). No differences were found between the ratings of potential training topics by the different healthcare professionals. However, healthcare professionals differed in the additional training topics they suggested to include in handover training. Primary and secondary care nurses stressed the importance of

making trainees more aware of multidisciplinary responsibility for the patient. In addition, they recommend to use training to improve the relations between handover stakeholders by encouraging trainees to put oneself in someone else's position when handing information over. The primary and secondary care doctors, on the other hand, suggested that training should focus on increase the speed of handover and on summarizing information for handover in a structured and concise manner.

With respect to recommendations for the training delivery, Table 3 shows that participants from different countries differ in their recommendations and preferences. The Dutch participants recommended to limit training duration to one day maximum and a slightly higher percentage of Dutch participants favoured self-study or e-learning than participants from the other three countries (see Table 3: 39 % n=9 vs. 5% n=1, 27% n=6, and 14 % n=4). The highest percentage of care professionals that perceived learning on the job as desirable was found in Spain (96%, n=27). A formal examination was not favoured at all by the Polish care professionals, whereas Swedish professionals (43%, n=10) favoured a formal examination in order to assess competency. Differences between healthcare professionals were only found for self-study or e-learning which was favoured more by primary care doctors (43 %, n=9) than by the other professionals (8-19 %, n=2-5).

Finally, no striking differences were found regarding the factors mentioned to influence the success of a handover training.

## **DISCUSSION**

The training needs analysis conducted in this study has provided more insight in the preferences of a diverse group of health care professionals regarding handover training. It is striking to find that many health care professionals, especially in primary care, are not satisfied with the current handover practices in their organizations.

Fortunately, they also have suggestions for improvement, which could be part of a handover training. Most of these suggestions pertain to improvement of the quality and frequency of communication (i.e., more and better communication), standardization of handover procedures, and the use of other and better tools during handover. These suggestions are in line with suggested handover training topics in review studies [14, 20, 21]. However, it is striking to see that when being asked to indicate important training topics, participants rate the training of standardized protocols or use of tools slightly less important than topics like alertness to vulnerable patient groups, awareness of responsibility, communication skills and knowing what to hand over. Apparently, participants are or have been made aware of the importance of focussing in a training not only on standardization of procedures, but that it is also important to become more aware and alert and think about what to hand over and how to hand over information.

Regarding the delivery of the training it was recommended by the majority of the participants to provide conventional training sessions with practical assignments for small, multidisciplinary groups. This is a relatively common manner of delivering a training, except for the multidisciplinary group composition. Apparently participants find it important to train together with colleagues to whom they hand over the patient.

Besides these agreements in preferences and recommendations of the diverse group of stakeholders in handover, also some differences were found. This indicates that although it is possible to standardize some topics and the delivery of a handover training, customization is also necessary to take into account trainees' needs and optimize the effectiveness of the training. For example, it appeared that secondary care professionals are more satisfied with the current quality of handover practices than their colleagues in primary care. As a consequence secondary care professionals might be harder to convince to participate in handover training, because they do not perceive its

necessity. Promotion of participation in training, one of the factors for successful training, should therefore focus especially on secondary care professionals.

In addition, customization is necessary to take into account the diversity of experienced handover problems and suggested solutions to these problems. In this way, the training becomes more relevant for the trainees and ensures transfer of training, indicated by the participants as an important factor for success. This means that besides common, standardized topics (e.g., communication skills, knowing what to handover over, awareness and alertness) the training should also include topics based on handover problems experienced by the trainees and relevant solutions to these problems.

Customizable topics for the study populations are for example putting oneself into someone else's position (suggested by the nurses), increasing the speed of handover (suggested by the doctors), and decreasing the time between discharge and letter of discharge (suggested by the Dutch professionals). It is also possible to customize a training by emphasizing certain topics more than others or to use different instructions, assignments of examples. For example when discussing the topic 'handover procedure' Polish trainees will be trained to always hand over information after discharge, whereas Dutch trainees, who already have developed these skills, will be trained in decreasing the time between discharge and sending the discharge letter and providing feedback. These customized topics can be deduced from a training needs analysis that is conducted prior to training.

## **CONCLUSIONS**

Although standardization of handover training seems to be an intuitive solution to handovers problems, a training needs analysis shows that one size does not fit all. Therefore, providing a completely standardized handover training may not be the most effective approach to improve handovers.

A more promising approach that matches the findings of the needs analysis might be mass customization. In this case, the handover training has both basic or generic training topics and delivery aspects and flexible or customizable elements. Customization is based on the results of a training needs analysis that reveals the experienced needs of trainees or an organization. Based on the findings of the current study it can be recommended to include the following generic training topics and delivery aspects in a handover training: a short conventional training for a small multidisciplinary group, focussing on awareness of responsibility, knowing what to hand over and how (i.e., communication skills) and alertness to vulnerable patient groups. Some customizable training delivery aspects and training topics that could be derived from our findings are for example providing also e-learning (Dutch professionals) or formal examination and to focus on speed of handover (doctors and Dutch professionals), or to stress the importance of always handing over all patient information (Polish professionals).

### **Limitations of the current study**

There are two limitations that need to be taken into account when interpreting the data. First, the small number of participants limited more advanced analysis. It was not possible to compare the preferences and recommendations between different groups of professionals within a country. However, the study population is a purposeful sample, showing that even in the four countries participating in the study differences in handover problems and solutions to these problems exist, which led to different needs for training. Second, the data was collected only by means of a questionnaire. Though a questionnaire is a well-accepted, cost-effective method its disadvantage lies in its limited contribution to in-depth insights. By adding open questions that invited

participants to express their opinions and suggestions in a free-text format this disadvantage was partly countered.

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**Competing interest statement.** All authors have completed the Unified Competing Interest form at [www.icmje.org/coi\\_disclosure.pdf](http://www.icmje.org/coi_disclosure.pdf) (available on request from the corresponding author) and declare: no support from any organisation for the submitted work; no financial relationships with any organisations that might have an interest in the submitted work in the previous 3 years; no other relationships or activities that could appear to have influenced the submitted work.

## **Contributorship Statement**

Wendy Kicken: substantial contributions to conception and design, acquisition of data, analysis and interpretation of data; drafting the article (all sections), revising it critically; and final approval of the version to be published.

Marcel van der Klink: substantial contributions to conception and design, acquisition of data, analysis and interpretation of data; drafting the article (background and discussion), revising it critically; and final approval of the version to be published.

Paul Barach: substantial contributions to revising the article critically, and final approval.

Henny Boshuizen: substantial contributions to conception and design; interpretation of data; revising the article critically, and final approval.

**Table 1. Background characteristics of the study population**

Profession (N)	Gender		Country of residence		Age M (SD)	Years in profession M (SD)	Prior training in handover*	
Primary care nurse (27)	Male	0	Spain	7	47.8 (7.8)	22.9 (8.7)	As a student	4
	Female	27	Poland	7			As an employee	7
			Sweden	7			No training	14
			Netherlands	6				
Primary care doctor (21)	Male	5	Spain	9	46.4 (7.8)	18.0 (8.9)	As a student	4
	Female	16	Poland	4			As an employee	4
			Sweden	4			No training	13
			Netherlands	4				
Secondary care nurse (24)	Male	0	Spain	6	39.4 (11.7)	15.7 (10.6)	As a student	2
	Female	24	Poland	7			As an employee	9
			Sweden	6			No training	11
			Netherlands	5				
Secondary care doctor (24)	Male	8	Spain	6	37.8 (11.2)	9.4 (10.9)	As a student	6
	Female	16	Poland	4			As an employee	4
			Sweden	6			No training	13
			Netherlands	8				

\*Note: Not all participants filled out the question on 'Prior training in handover'

**Table 2. Mean scores for the suggested training topics**

Topics	Ratings* by all participants	Ratings by profession*				Ratings by country*			
	M (sd)	prim. care nurses M	prim. care doctors M	sec. care nurses M	sec. care doctors M	The Neth. M	Poland M	Sweden M	Spain M
Alertness to vulnerable groups	1.32 (.47)	1.27	1.33	1.33	1.35	1.32	1.32	1.35	1.30
Communication skills	1.33 (.50)	1.35	1.29	1.35	1.35	1.36	1.32	1.41	1.26
What information needs to be handed over	1.38 (.49)	1.38	1.38	1.50	1.26	1.45	1.64	1.26	1.20
Awareness of responsibility	1.40 (.52)	1.38	1.29	1.46	1.48	1.41	1.55	1.48	1.22
Standardized procedures	1.69 (.51)	1.56	1.62	2.00	1.59	1.82	1.59	1.62	1.73
Use of tools	1.78 (.64)	1.85	1.55	1.79	1.91	2.36	1.82	1.59	1.44

\*(1= very important, 4= very unimportant)

**Table 3 Percentages of participants who recommend training delivery aspects**

Aspect of the design of the training	% of all participants	% participants by profession who would recommend this				% participants per country who would recommend this			
	Respondents (N=27)	Primary Nurses (N=27)	Primary Doctors (N=21)	Sec. care nurses (N=24)	Sec. care doctors (N=24)	Dutch (N=23)	Polish (N=22)	Swedish (N=23)	Spanish (N=23)
4 hours	47	27	48	65	50	50	48	31	61
1 day	47	48	52	35	52	57	43	32	54
Several days	19	35	19	13	9	0	14	30	31
Small group	83	89	86	83	77	96	86	65	86
Large group	12	11	14	4	21	4	9	17	18
Self-study / e-learning	22	19	43	17	8	39	5	27	14
Learning on the job	80	70	76	88	88	70	68	83	96
Heterogeneous group	80	77	81	96	65	65	77	91	85
Homogeneous group	32	39	33	8	48	39	23	46	22
Assignments	87	85	95	88	83	87	96	73	93
Examination	26	42	24	17	17	30	0	43	29

**Table 4. Commonly mentioned training success factors**

Factor	Examples
Promoting participation	Convince audience of importance of undertaking the training, clear relevance for practice
Creating favourable workplace conditions	All staff should be trained, being able to apply in practice what was learned
Trainer characteristics	Devoted and skilled trainer
Trainee characteristics	Willingness to change and learn, feeling comfortable to share opinions and experiences with each other
Training delivery	Clear and comprehensive program, structure and communication, interaction with the audience, realistic examples, practical assignments