

Factors influencing the implementation of the guideline *Triage in emergency departments*: a qualitative study

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Aims and objectives. The objectives are: (1) to identify factors that influence the implementation of the guideline *Triage in emergency departments* [2004] in emergency departments in the Netherlands, and (2) to develop tailored implementation strategies for implementation of this guideline.

Background. Guideline dissemination is no guarantee for guideline implementation. In 2004 the guideline *Triage in Emergency Departments* was disseminated in Dutch hospitals. Guideline revision was scheduled in 2008. Prior to the revision, factors which influenced the implementation of the guideline [2004] were studied to be addressed at the implementation of the revised guideline.

Methods. This is an exploratory study using a qualitative design including: a questionnaire sent to all emergency departments in the Netherlands ($n = 108$): four focus group interviews, including nurses and ward managers and in-depth interviews with ward managers and doctors. Based on the results, tailored implementation strategies and activities were suggested which target the identified influencing factors.

Results. Various factors at individual, social context and organisational level were identified as influencing the implementation of the 2004 version of the guideline, namely: level of knowledge; insight and skills; work preferences; motivation and/or commitment; support; informed doctors; preliminary work and arrangements for implementation; description of tasks and responsibilities; workload and resources. Ward managers, nurses and doctors mentioned similar as well as different factors. Consequently, tailored implementation strategies and activities related to education, maintenance of change, motivation and consensus-building, information, organisation and facilitation were suggested.

Conclusion. Nurses, ward managers and doctors broadly indicated similar influencing factors, although the importance of these factors differed for the different groups. For nurses, resistance and lack of resources are most important, ward managers mentioned culture and doctors the availability of doctors at the emergency department.

Relevance to clinical practice. Insight into the barriers for implementation and tailoring implementation strategies to these barriers improves the implementation.

Key words: clinical guideline, emergency department, implementation, implementation strategies, influencing factors, nurses, nursing, triage

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Introduction

In 2004, an evidence-based guideline for systematic triage in emergency departments (EDs) was developed by the Dutch Institute for Healthcare Improvement (CBO) and the Dutch Society of Emergency & Accident Nurses (NVSHV) (Nederlandse Vereniging Spoedeisende Hulp Verpleegkundigen 2004, Elshove-Bolk *et al.* 2007). Triage is defined as: 'the classification of patient acuity that characterises the degree to which the patient's condition is life threatening and whether immediate treatment is needed to alleviate symptoms' (Gilboy *et al.* 2005, p. 17). Based on this classification, nurses at the EDs prioritise patients in sequence of need.

Background

The guideline *Triage in emergency departments* had to be updated in 2008. We evaluated the adherence and the implementation process of the 2004 guideline in a previous study, to generate useful insights for the revision of the guideline in 2008. Results showed that over 30% of all EDs in the Netherlands did not perform triage. Furthermore, EDs had a mean adherence of less than 65% of the recommendations in the guideline, with a variance of 2–78%. (Janssen *et al.* 2011).

In health care organisations the importance of evidence based guidelines has increased extensively in recent years. Guidelines are useful tools to turn evidence-based knowledge into practice which leads to a consistent approach for improving patient care (Rycroft-Malone & Duff 2000). Nevertheless, literature shows that the existence of a guideline does not mean that recommendations of the guideline are actually followed (Estabrooks 1999, Francke *et al.* 2008, Forsner *et al.* 2010, Janssen *et al.* 2011). To facilitate implementation, models have been developed which support a systematic programmatic approach to the introduction of innovations, including guidelines. It is suggested that following the steps of these models would increase the chance of successful implementation of innovations (Grol *et al.* 2005, Van Achterberg *et al.* 2008). One systematic approach is the theoretical framework developed by Grol and Wensing (2005). Grol *et al.* (2005) have integrated several theories and approaches related to effective implementation of innovations in an implementation model. This led to a model consisting of five steps: (1) development of a concrete proposal for change in clinical practice, (2) analysis of the target group and identification of the obstacles or barriers for change, (3) linking the activities to the needs, facilitators and barriers for change, (4)

development and implementation of an implementation plan and (5) continuous evaluation or monitoring based on indicators.

For a successful change of professional behaviour, factors that promote or hinder the implementation of guidelines should be identified (step two of the framework of Grol and Wensing) to tailor guidelines to the setting and to design appropriate strategies to overcome potential barriers (step three) (Grol 1997, Fleuren *et al.* 2004, Grol & Wensing 2005, Baker *et al.* 2010, Wensing *et al.* 2010). Influencing factors vary from setting to setting. These are often classified in characteristics related to the innovation (e.g. complexity of the guideline, presence of clear scientifically based knowledge, involvement of the target group during the development of the guideline), the individual professional (e.g. experience and knowledge, age), the social context (e.g. support, familiarity and agreement with the guidelines among professionals, openness to change) and the organisation (e.g. training, personnel, workload, access to research related resources, time) (Grol 1997, Wensing *et al.* 1998, Nolan & Cooke 2002, Fleuren *et al.* 2004, Grol & Wensing 2004, Ring *et al.* 2005, Grol *et al.* 2007, Estabrooks *et al.* 2008, Francke *et al.* 2008, Gerrish *et al.* 2008).

Although an earlier study (Janssen *et al.* 2011) provided insight into the extent that the recommendations of the guideline *Triage in emergency departments [2004]* were followed, it did not clarify the factors that influenced the implementation of the guideline. Based on the framework of Grol *et al.* (2005), the first aim of this study is to perform a context analysis to explore the experiences of nurses, ward managers and doctors in guideline implementation and the factors that influenced the adoption of the Dutch guideline *Triage in emergency departments [2004]* (step two of the framework). The second aim is to develop specific implementation strategies and activities for the revised guideline [2008] which target the identified factors (step three of the framework).

Methods

Study design and setting

An inventory on factors hindering or promoting the implementation of guidelines can be performed using qualitative and/or quantitative methods (Grol *et al.* 2005). This exploratory study used a descriptive design with qualitative and quantitative elements. Firstly, to obtain insight into the factors that influenced the implementation of the guideline *Triage in the emergency department [2004]* from experiences of nurses, ward managers and doctors working at EDs in the

Netherlands. Secondly, to develop implementation strategies and activities to overcome the factors that hinder the implementation of the guideline.

Data collection

Different methods were used to gain understanding of the influencing factors namely a questionnaire, focus groups and in-depth interviews:

Questionnaire

In 2007, a questionnaire was sent to every ED in the Netherlands ($n = 108$). All ward managers were asked to fill in the questionnaire and to select one nurse and one doctor to do the same. The questionnaire consisted of questions based on the recommendations of the guideline. Answering scales were a two-point scale ('yes – no') or a six-point scale ('never – sometimes – regularly – often – mostly – always'). If EDs replied that they did not carry out a specific recommendation, a follow-up question was asked whether they could identify 'why not'. For this study only the data of these 'why not' questions were used, as these questions pointed out specific factors that influenced the uptake of triage. For example: 'why are patients arriving at the ED not seen by a nurse within five minutes, as the guideline recommends?'

Focus groups

In addition to the questionnaire, focus groups were organised, to cover a wider range of influencing factors by the questionnaire. By performing focus groups we could go more in-depth.

To gain participants for the focus group, two approaches were used. Firstly, in March 2007, members of the Dutch Society of Emergency & Accident Nurses (NVSHV) were approached by post ($n = 200$). These members were randomly selected from a mailing file of the NVSHV which consisted mainly of nurses working in the ED and were asked to participate. Secondly, ward managers who stated in the national questionnaire that their ED used the Manchester Triage System (MTS) or the Emergency Severity Index (ESI) ($n = 48$) were invited to participate and also asked to indicate a nurse on their department who would be willing to participate. In May 2007 all focus groups were held.

In-depth interviews

No doctors participated in the focus groups, as it was difficult for them to attend due to time pressures, therefore on site in-depth interviews were organised with them. Doctors were recruited from the same hospitals as the ward managers who were interviewed. This ensured that representatives

of all professions dealing with triage were involved in the study. The interviews took place between July–September 2007.

Inclusion criteria

All EDs (a full population sample) in the Netherlands received the questionnaire. For the participants of the focus groups and interviews inclusion criteria were: participants worked in an ED that performed triage using the MTS or the ESI; participating nurses had to perform triage; participants worked in different types of hospitals (university hospital, teaching hospital and non-teaching hospital) and in hospitals distributed across the Netherlands. A specific inclusion criterion for the interviews was that the ward managers had not already participated in the focus groups.

Procedure

Participants in the questionnaire study, the focus groups or the interviews were informed about the purpose. Assurances of confidentiality and anonymity were also given. For the focus groups and the interviews the primary questions were open: 'In your opinion, which factors (1) hindered and (2) promoted the implementation of triage following the recommendations of the guideline *Triage in the emergency department [2004]* at your ED?' Besides the primary questions, another question was asked during the interviews, namely if persons could give a suggestion to overcome any barriers. Subsequent discussions explored the influencing factors and the suggestions more deeply.

During the focus groups all mentioned factors were recorded on a flipchart. At the end of the focus groups all participants were invited to point out three main factors that influenced the implementation process at their ED. This was done to classify the factors of importance.

The focus groups lasted no longer than 90 minutes, the interviews lasted 30–60 minutes. The focus groups were conducted by two researchers (MJ and CK), the interviews by one researcher (MJ). Notes about issues arising during the focus groups or the interviews were made and questions were asked afterwards if these issues had not been clarified during the focus groups or interviews.

Analysis

Influencing factors stated in the questionnaire were written down. As some factors were very specific, we derived themes from individual remarks and then using simple frequencies to assess relative importance as we assumed that there is a close

relation between the frequency to which a factor was mentioned and the degree of influence. Factors which were mentioned only once were assumed to be specific to that ED and were left out of the analyses. The other factors were then classified into the categories; innovation, individual, social or organisational (Grol *et al.* 2005).

To analyse the focus groups and interviews, qualitative content analysis was carried out to obtain insight into the factors that influenced the implementation of the guideline and the activities that were used or were suggested to overcome barriers (Polit & Beck 2008). The focus groups and interviews were audio taped and transcribed. As the participants of the focus groups individually pointed out the most important factor, a distribution of the most influential to least influential factor was made, using the results of the flipchart. Common themes were identified by two researchers (MJ and CK), categorised by hand and matched to the categories related to the innovation, the individual, the social context and the organisation (Grol *et al.* 2005). Member checking confirmed the credibility of the data: each participant was given a full transcript of the interview with a summary of themes to determine whether the themes were appropriately identified and matched their responses. The results of the questionnaire and interviews were then combined.

Development of implementation strategies

The next phase was the development of tailored implementation strategies and activities to overcome the factors that hindered the uptake of triage. We selected different strategies and suggested activities to overcome the factors that influenced the implementation negatively (Grol *et al.* 2005).

Meeting with experts

An expert meeting was organised to present and discuss the results related to the influencing factors with the tailored strategies and activities. The experts consisted of the chairperson of the NVSHV, four nurses, two ward managers, seven doctors (all working at an ED), an implementation counsellor and a guideline development counsellor. The experts did not participate in the focus groups or interviews.

Ethical approval

The recommendations of the Netherlands' Central Committee on Research Involving Human Subjects were executed, following the Step-by-step plan RC review (<http://www.ccmo-online.nl/main.asp?pid=1&taal=1>). Ethical approval of a certified healthcare ethics committee was not needed, as

by Dutch law this is not necessary when patients are not exposed to experimental care or treatment, when data collection does not occur at patient level, when participants are not asked for medical or highly personal information and when data collection is not burdensome (<http://www.ccmo.nl>).

Results

A total of 81 out of 108 EDs (75%) returned the questionnaires. Of these 81 EDs, 59% used the MTS ($n = 42$) or the ESI ($n = 6$). In total, the ward managers pointed out 12 influencing factors, the nurses mentioned 15 factors and the doctors stated four main factors. In total four focus group meetings were held. Due to practical reasons the focus groups were composed differently; one focus group consisted of only nurses ($n = 7$), one group of only ward managers ($n = 3$) and two mixed focus groups enclosed nurses ($n = 11$) as well as ward managers ($n = 4$). The interviews took place with three ward managers and three doctors. Nurses, ward managers and doctors experienced differences and similarities on factors which influenced the implementation of the guideline. Table 1 shows all factors that came up from the questionnaire, focus groups and interviews.

Nurses' perception of factors that influence the implementation of the guideline

The main factors stated in the questionnaire were lack of resources (triage room, Information Communication Technology software (ICT-software), education and personnel) and workload. Of the resources, shortage of personnel and the absence of a triage room were factors which had the most negative influence. If the ED did not provide these conditions, nurses were more reluctant to perform triage.

In the focus groups, resources and workload were also mentioned as influencing factors, but not as most important. One key factor mentioned by nurses was related to the social context (resistance to perform triage among colleagues and how difficult it is to overcome resistance), as one nurse clearly stated:

In the beginning there was a lot of resistance among the nurses. Creating clarity and informing the nurses what triage was about, finally resulted in acceptance of performing triage. It is important to point out what triage yields and what the benefits are. You should change the whole behaviour of nurses. It takes years before there is a mental change. Triage can be seen as a new specialisation.

The second key factor was commitment to perform triage among nurses as well as among doctors. If nurses agreed to

Table 1 Factors influencing the implementation of triage at the ED

	<i>Influencing factors*</i>		
	Nurse	Ward manager	Doctor
The guideline	<ul style="list-style-type: none"> • <i>Neurological symptoms and fever amongst children are not incorporated in urgency codes</i> 	<ul style="list-style-type: none"> • <i>Neurological symptoms and fever amongst children are not incorporated in urgency codes</i> • Triage time as indicated in the guideline is too short 	<ul style="list-style-type: none"> • <i>Neurological symptoms and fever amongst children are not incorporated in urgency codes</i>
The individual	<ul style="list-style-type: none"> • <i>Lack of knowledge, insight and skills</i> • <i>Work based on experiences and old routines</i> 	<ul style="list-style-type: none"> • <i>Lack of knowledge and skills among nurses</i> • <i>Work based on experiences and old routines</i> • <i>No motivation/ discouraged nurses</i> • <i>Feedback is not always appreciated</i> 	<ul style="list-style-type: none"> • <i>Lack of knowledge, insight and skills</i> • <i>No motivation</i> • <i>No priority for target time</i>
The social context	<ul style="list-style-type: none"> • <i>Culture</i> • <i>Resistance</i> • <i>No cooperation with doctors</i> • <i>No feedback</i> • <i>No commitment</i> • <i>Lack of support (all professions)</i> • <i>Change in society (increased number of patients, need for care changes from daytimes to evening times)</i> 	<ul style="list-style-type: none"> • <i>Culture</i> • <i>Resistance</i> • <i>No cooperation with doctors</i> • <i>Low attendance of doctors during information meeting</i> • <i>Difference in need between ward managers and nurses</i> • <i>No insight in relevance among nurses and doctors</i> • <i>No involvement of doctors during implementation</i> 	<ul style="list-style-type: none"> • <i>Culture</i> • <i>No feedback or evaluation</i> • <i>Low attendance information meeting</i> • <i>Doctors are not informed on the urgency codes of patients</i> • <i>Absence of ED-doctors</i> • <i>No instruction of triage</i> • <i>Frustration among nurses if doctors do not follow the protocol</i> • <i>Unfamiliarity with triage</i>
The organisation	<ul style="list-style-type: none"> • <i>Shortage of personnel</i> • <i>No triage room</i> • <i>No ICT-software[†]</i> • <i>Lack of education</i> • <i>Workload</i> • <i>No task description/ no triage protocol</i> • <i>No evaluation, no audit</i> • <i>Top-down or bottom-up implementation</i> • <i>Outpatient clinics/ patients arriving by ambulance</i> 	<ul style="list-style-type: none"> • <i>Shortage of personnel</i> • <i>No triage room</i> • <i>No ICT-software</i> • <i>Lack of education</i> • <i>Workload</i> • <i>No triage protocol/ no task description</i> • <i>No evaluation, no audit</i> • <i>Top-down or bottom-up implementation</i> • <i>No insight in advantages</i> • <i>No cooperation of management hospital</i> • <i>No time for implementation</i> • <i>No clarity in juristic consequences</i> • <i>Problems with ICT-software</i> • <i>No ED-doctor</i> • <i>High change of doctors</i> 	<ul style="list-style-type: none"> • <i>Shortage of personnel</i> • <i>Lack of education</i> • <i>Workload</i> • <i>No task description nurses</i>

*The italicised factors are mentioned by two or more professions.

[†] Information Communication Technology software.

perform triage and the doctors did not follow the agreements related to the target time (seeing the patients in order of urgency in a specific time schedule) it discouraged the nurses from performing triage.

Ward manager's perception of factors that influence the implementation of the guideline

In the questionnaire, the main factors ward managers mentioned concerned; workload, shortage of personnel and

the absence of a triage room. In the focus groups and interviews ICT-software and education were also mentioned as important conditions for triage. During the focus groups and interviews it appeared that the ward managers considered these conditions as less important than the nurses' opinion: 'If one cannot realise all conditions fully, you should try to make the best of it and see what you can do'.

Contrary to the ward managers, nurses expressed resistance if the resources were not present. A good example is

related to the amount of personnel. The ward managers' view on triage was that when it is crowded at the ED, triage is especially important. The nurses' opinion was the opposite: triage should not be performed in busy times since nurses are needed in the treatment rooms. Or as one ward manager mentioned:

I had the idea that nurses resisted to perform triage, as long as I did not facilitate all preconditions. This ended up in a long discussion. Nowadays I see that nurses are convinced of the advantages of triage, although some still say: 'I cannot perform triage, as...' And then the same old arguments are stated.

Another important factor brought up by the ward managers during the focus groups and the interviews was related to the social context, especially culture at the ED. According to the ward managers, nurses base their work merely on experiences and old routines. It takes time and patience to change old routines. Also triage is experienced by ward managers as a negative activity as one respondent mentioned:

Some nurses who are willing to perform triage are somewhat 'disdainfully' looked at by other nurses. The word triage sounds somewhat 'negative'; who is the 'triage-girl' today.

At the organisational level, ward managers pointed out that feedback of results is vital, as quoted in the next fragment:

Feedback of the results to nurses should be part of the work. Do not only look at the advantages and disadvantages for nurses but also consider the advantages of triage for patients. For example, does triage lead to more satisfaction among patients? So, give insight in all benefits of triage, before and after implementation.

Doctors' perceptions of factors that influence the implementation of the guideline

In the questionnaire the doctors mentioned workload as an important influence on the use of triage. The interviews showed that the doctors had a different perspective on the influencing factors. To them, the most important factor was the availability of doctors on the ward. Doctors are often working at different locations in the hospitals: the inpatient departments in the hospitals or the outpatient clinics. Therefore, it is for the doctors on duty often difficult to meet the target times on the ED. Furthermore, one respondent pointed out a difference between hospitals is the presence of a specialised ED-doctor. They are trained to work in the ED fulltime. Therefore ED-doctors are very well aware of the triage procedure and they can inform their colleagues from other disciplines. Hospitals without an ED-doctor have more problems with triage.

According to the three participating doctors, organising specific meetings for doctors on triage is a positive factor, although there was some concern about the attendance at these meetings. Often just a few doctors joined these meetings, so most of them remained uninformed. Another factor was a high turn-over of doctors. Often doctors are not informed about the procedure related to triage. It takes time before they are informed and familiar with performing triage. One doctor described the implementation of triage at the department as follows: 'When implementing triage, we expected that from the moment everybody was informed about the triage system, everybody automatically would perform triage. This appeared to be wrong. Among ED-doctors who use triage daily it is not a problem. Within a few months you know the procedure. Doctors of other disciplines who were not involved in the implementation have more problems in the uptake of triage.'

One doctor mentioned the importance to actually do something with given feedback; it discourages doctors as well as nurses from performing triage, if nothing is done with feedback: 'At the ED everybody was enthusiastic to perform triage. But when you find out that nobody does anything with the results of triage, it is difficult to keep everybody motivated'.

Although doctors experience triage as important, one doctor portrayed a negative consequence of triage: 'My idea about triage is that sometimes patients have to wait longer in the waiting room than necessary, specific among patients with code blue or green. Doctors easily say: 'I don't need to see the patient yet, as I still have some time left'. As if it gives you a justification that patients have to wait longer than the target times gives you. During busy times, it is medically justified for patients to wait. However, besides medical urgency you should also consider the client's perspective'.

Implementation strategies

The influencing factors that hindered the implementation (Table 1) can be categorised in key factors namely: knowledge, insight and skills; daily routines; motivation and/or commitment; support; informed doctors; preliminary work and arrangements for implementation; description of tasks and responsibilities; workload and; the presence of resources (Table 2). Subsequently, these factors were linked to the following implementation strategies: educational strategies, strategies for the maintenance of change, motivational strategies and consensus-building strategies, informative strategies, organisational strategies and facilitating strategies.

During the interviews, activities were discussed to resolve these barriers. These activities were placed under the different strategies. This way every ED could, based on their own influencing factors, set out their own activities to decrease the

influence of the factors that inhibit the implementation of triage at their department. Table 2 shows the influencing factors linked with the different strategies and suggested activities, based on the ideas of the respondents.

Discussion

From this study, together with an earlier study (Janssen *et al.* 2011), it becomes clear that, although the guideline *Triage in emergency departments* was released in 2004, after three years the guideline was not (fully) implemented in each ED. This is contrary to what was expected as the NVSHV and the

Netherlands Health Care Inspectorate (IGZ) who promoted the guideline as a national standard. This study gives insight into reasons why EDs did not implement the guideline (step 2 of the implementation model of Grol & Wensing 2005). Furthermore this study linked implementation strategies and activities to overcome the barriers that hinder the uptake of the guideline (step 3).

Influencing factors

Some variety was found between the different professions' perceptions on influencing factors. Most factors mentioned

Table 2 Implementation strategies and activities based on the influencing factors

Influencing factors	Implementation strategies	Suggested activities
<i>The individual</i> <i>Shortage in knowledge, insight and skills</i>	Educational strategies	<ul style="list-style-type: none"> • Certified education in acute care or ED-education • Official training in triage • Training-on-the-job • Testing of knowledge (e.g. case discussion)
<i>Preference of old routines or disregard to perform triage</i> <i>The social context (team approach)</i> <i>Shortage of motivation and/or commitment of nurses and doctors</i> <i>Shortage of support of colleagues and management</i>	Motivational and consensus-building strategies	<ul style="list-style-type: none"> • Reflection, supervision, dialogue • Evaluation & feedback on performance triage
<i>Lack of informed doctors</i>	Informative strategies	<ul style="list-style-type: none"> • Informing all involved disciplines on the purpose, content, use and the advantages of triage • Norm setting: all nurses with the required education need to perform triage • Creating commitment before implementation of triage (e.g. newsletters, team meetings) • Feedback on team performance • (Multidisciplinary) reflection: evaluation and case discussions • During implementation involvement of doctors • Organising special meetings for doctors • ED-doctors informing doctors of other disciplines
<i>The organisation</i> <i>Lack of preliminary work and arrangements</i> Disagreements in tasks and responsibilities Workload	Organisational strategies	<ul style="list-style-type: none"> • Formation of a triage workgroup • Inventory of which recommendations of the guideline the ED already uses and which not • Schedule time for preliminary work, implementation and evaluation • Translation of the guideline to a local situation/ protocol • Drawn up agreements with doctors • Reflection in a multi- and monodisciplinary team • Feedback on triage, specific during rush hours • Insight in advantage of triage • Assigning one nurse responsible for triage per shift
<i>No triage workgroup</i> No triage room No ICT-software [†]	Facilitating strategies	<ul style="list-style-type: none"> • Formation of a triage workgroup involving ward managers, nurses and/or doctor (informal leaders) • Description of tasks workgroup • Consultation with ward managers concerning the possibilities • Organising of a triage room: conditions of the triage room • Consultation with ward managers concerning the possibilities • Stimulating the to use ICT-software (by nurses and doctors)

[†] Information Communication Technology software.

by nurses were also mentioned by ward managers. A few of these factors were also mentioned by doctors. Although there was overlap between the professions, the relevance of the factors could differ. For example, nurses mentioned not performing triage at busy times. Ward managers mentioned busy times as an influencing factor as well, but they did not find this a significant factor for not performing triage. On the contrary, they stated that, specifically at busy times, triage is important and should therefore be performed, because it is in the interest of patients. One doctor mentioned busy times also. Nevertheless that doctor had the opinion, that when the decision is made to perform triage, nurses should continue to perform triage, whether they are busy or not. One explanation for the difference of importance per factor pointed out by the different disciplines could be due to other interests and consequences. As the professions have a somewhat different view on the influencing factors it affirms the importance of including all disciplines during the identification of factors that could influence the implementation of the innovation. This way strategies and activities could be developed to overcome all factors that hinder the uptake of the innovation.

The factor 'shortage of personnel' was mentioned by all three of the professions. Although this is a barrier for the implementation of triage, it is difficult to overcome this obstacle. A reason given is that EDs are dependent of the management of the hospital if they want to employ more nurses. Concerning this barrier, the ward managers were less reluctant than nurses. Nurses mentioned they would not perform triage if no extra nurse could be employed. Ward managers' point of view was that they should be creative in performing triage. As this problem was mentioned often, more research on this subject should be undertaken; is the number of nurses working at the ED still sufficient to cope with the demand of the society.

Influencing factors were found in all categories (innovation, individual, social context and organisation). Related to the innovation only one factor that hindered the implementation was mentioned, namely that not all symptoms are included (mentioned symptoms were neurological symptoms and fever in children). Nurses as well as the ward managers and doctors mentioned this factor. In an adjusted version of the MTS, these two symptoms are integrated (Manchester Triage Group 2007). Although no more factors related to the innovation were found, it does not mean that no more factors related to the innovation exist that obstruct the implementation. One explanation for only one found factor could be that the participants did not consider factors related to the innovation as most important.

Implementation strategies

Insight in factors influencing implementation supported the development of tailored implementation strategies that could be used to promote the uptake of the revised guideline [2008]. Although this study examined the implementation of the guideline *Triage in the emergency department*, it could act as an example for other guidelines.

It is important to take into consideration that the strategies developed are based on factors experienced by EDs who have or have attempted to implement the 2004 guideline. In this way an experience-based rather than an evidence-based set of implementation strategies is developed. The strategies can be used during the implementation of the revised guideline.

Data collection

Due to practical reasons the composition of the focus groups differed. Although this could have influenced the results, no new factors were found during the last interview. Therefore we believe we have achieved data saturation and found most of the influencing factors.

Since the participating persons came from different hospitals in the Netherlands and different types of hospitals (university hospital, teaching hospital and non-teaching hospital), we can conclude that the factors found give a clear insight into which factors influenced the implementation process concerning the guideline in EDs in the Netherlands.

Triangulation of data was performed to find more influencing factors. It appeared that the interviews pointed out different and more factors than we received from the questionnaire only. Furthermore the factors found in the questionnaire were more focused on organisational factors whereas the interviews showed that individual and social factors were important as well. Therefore we suggest different approaches to explore factors which hinder or facilitate innovations.

Study limitations and recommendations

This study has some limitations. Firstly, the data collection took place amongst persons who worked at an ED that implemented triage (MTS or ESI) as we were interested in factors they pointed out as influencing the implementation process. This study does not present clear reasons why departments have not implemented triage. Secondly, the possibility exists that only respondents who are positive towards triage were included: ward managers indicated one nurse and one doctor at each ED to fill in the questionnaire and participation in the focus groups and interviews was voluntary.

Possibly, this study gives less insight into the opinions or experiences of persons who work at an ED where triage is implemented and who are not positive about triage. This selection bias may be reflected in the given answers. Therefore we would recommend an investigation into the reasons why EDs have not implemented triage. Thirdly, a possible bias could be related to the researchers who conducted the focus group and the interviews. They were involved in another study related to the implementation of the guideline and may therefore have been known to the participants. Despite the possible bias, we feel this study gives a balanced overview what problems ED's face during the implementation of the guideline.

We tailored the implementation of strategies and activities to deal with the barriers for the implementation of the guideline to improve adherence. Although it gives clear insight into how to implement triage, it does not mean that all the activities should be used in each department. Also, the activities in Table 2 were recommended by the participants and we do not state that this list is complete. When departments have to implement innovations it is important to get an insight into local factors that hinder the uptake. Local strategies and activities should be based on local factors (Van Achterberg *et al.* 2008). Therefore we suggest that, when implementing innovations, preliminary exploration of the obstacles or barriers for change should take place. Furthermore, no research was performed to test whether these activities are effective. This study was not directed to the effectiveness and efficiency of these activities, so further research is required to retrieve information on the effectiveness and efficiency of these activities.

Although the activities are explicitly designed for the implementation of the guideline *Triage in the emergency department*, the evaluation approach used in this study can be a reference method for other innovations.

Conclusions

To conclude, between nurses, ward managers and doctors working in a Dutch ED there was an overlap in factors they perceived as influencing the implementation of triage, although their views on these factors differed. The most influencing factors mentioned by nurses were resistance and lack of resources. Amongst ward managers, the factor

culture was most influential and among doctors the availability of doctors at the ED. The current development of specialised ED-doctors appears to have a positive influence on the implementation of triage.

Insight into factors which influence the uptake of innovations can be used in the development of implementation strategies. Based on the results of this study, it can be concluded that activities related to education, motivation and consensus-building, informing, organisation and facilitation should impede the implementation process of triage.

Relevance to clinical practice

Implementation of guidelines is essential for improving the quality of care. Insight into the barriers for implementation and tailoring implementation strategies to these barriers improves the implementation.

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Contributions

Study design: MJ, JMdG; data collection and analysis: MJ, CK, JMdG and manuscript preparation: MJ, TvA, MA, CK, DS, JM.

Conflict of interest

The author(s) declare that they have no conflict of interests.

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