

Positive patients' attitudes to prehospital care

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ABSTRACT

INTRODUCTION: The aim of the study was to elucidate the patients' perceptions of the whole prehospital "chain-of survival" from the 1-1-2 call was made to arrival at the hospital; we wanted to study especially the impact different urgency levels had on patients' overall impression.

MATERIAL AND METHODS: The study was based on 1-1-2 medical emergency calls and forms a part of a larger postal survey among 6,535 patients who requested and received ambulance services. The answers were dichotomized into "problem scores" and "non-problem scores". The patients' overall impression was analysed in logistic regression models.

RESULTS: The study was based on 1,419 answers (response rate 58%). Overall, 98% of 1-1-2-patients characterized the prehospital care as "Very good" (82%) or "Good" (16%). Patients' overall perceptions were dependent on age, evaluated urgency, and the information they received about expected response time. Patients' self-evaluated urgency level was lower than that assessed by the prehospital.

CONCLUSION: The study shows that patients have a very positive attitude towards prehospital care, including criteria-based medical dispatch of ambulances. The overall impression of patients with urgency level A was significantly better than that of patients with urgency level B. The issues with most potential for improvement are: the assistance provided when calling 1-1-2 (first answered by the police and then the medical personnel), the prehospital personnel explaining what they were doing, the involvement of relatives and better information about expected ambulance response time.

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Prehospital care has changed from being a patient transport only into being an important part of the treatment [1]. The central element in modern prehospital care is emergency medical dispatch (EMD) centres, which serve to prioritize resources to ensure that patients with a life-threatening condition receive faster treatment than patients with less urgent complaints. EMD centres have been established in all five Danish regions. These centres are staffed with health-care professionals who give advice and prioritise the patients according to professionally founded dispatch criteria in accordance with the Danish Criteria Based Dispatch protocol, Danish Index [2]. The criteria are established in conformity with the

regional common objectives for response time intervals set by political decision-makers [3].

The most essential objective in Danish prehospital care has until recently been to uphold the average response time for all ambulances requested by Alarm 1-1-2 (1-1-2). Medical prioritizing was introduced in 2009, and the effect of this organizational change has been analysed in a previous article [3]. As from May 2011, all 1-1-2 calls concerning medical emergencies are answered by the EMD. It is important to obtain knowledge from the perspective of those receiving care [4]. In the present study, the focus is therefore on the patient perspective [5]. The aim of the study was to elucidate the patients' perceptions of the whole prehospital "chain-of survival" from the 1-1-2 call until arrival at the hospital. We wanted in particular to study the impact that the use of different urgency levels has on the patients' overall impression.

The typical pathway when requesting an ambulance is a call to Alarm 1-1-2. Such calls are answered by the police and diverted to health-care professionals at the EMD who support the patients with counselling and prioritize their needs on the basis of the information given on the phone about the patients' conditions. Besides an ambulance, a mobile emergency care unit (MECU) or a helicopter emergency medical service both of which have special competences (anaesthesiologist, nurses or paramedic) can be sent as a supplement in a rendez-vous model. The new ambulance service contracts are based on the level of severity and urgency of the patient's condition: A: urgent, potentially life-threatening, "immediate response"; B: urgent, but not life-threatening; C: non-urgent ambulance; D: non-urgent supine patient transport and E: other service or advice/instruction including taxis.

MATERIAL AND METHODS

The study was based on a postal survey conducted among patients in the Region of Central Jutland for whom an ambulance was sent. Respondents who did not read Danish were invited to answer the questionnaire electronically.

The questionnaires were sent to the patients one week after the inclusion period. The surveys were distributed in two periods to reduce the time between the experience and the response. The response deadline was set to three weeks after which one reminder was sent. Before sending the questionnaires, prospective,

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TABLE 1

Percentages of 1-1-2 patients with a "non-problem score" on the overall question. Related to background variables in a logistic regression model. Question: What was your overall impression of your contact with the ambulance service?

	Patients, n (%)	"Non-problem score", % (95% CI) ^a	Mean (SD)	Odds ratio (95% CI)		
				unadjusted	adjusted ^b	adjusted ^c
Total	1,362 (100)	81.6 (79.5-83.6)	–	–	–	–
<i>Gender</i>						
Female	664 (48.8)	81.0 (78.0-84.0)	–	1	1	–
Male	698 (51.2)	82.1 (79.2-84.9)	–	1.07 (0.82-1.41)	1.32 (0.92-1.89)	–
Age, yrs			53.61 (24.55)	1.01 (1.0-1.02)***	1.01 (1.01-1.02)***	1.01 (1.01-1.02)***
<i>Respondent</i>						
Patient	1,064 (80.6)	82.6 (80.3-84.9)	–	1	1	–
Relative	256 (19.4)	78.5 (73.5-83.6)	–	0.77 (0.55-1.08)	0.95 (0.62-1.47)	–
<i>Evaluated urgency level</i>						
Level A	874 (100)	82.6 (80.3-84.9)	–	1	1	1
Level B or level C, N _{Level B} + N _{Level C}	479 + 9 (55.8)	78.5 (73.5-83.6)	–	0.73 (0.55-0.97)	0.68 (0.44-1.03)	0.72 (0.53-0.99)*
Response time, min.			10.58 (7.90)	1.00 (0.98-1.02)	1.01 (0.99-1.04)	–
<i>Mobile emergency care unit</i>						
No	1,064 (78.1)	80.5 (78.1-82.8)	–	1	1	–
Yes	298 (21.9)	85.6 (81.6-89.6)	–	1.44 (1.01-2.06)*	1.12 (0.68-1.85)	–
<i>Information about expected response time</i>						
No	321 (30.5)	70.7 (65.7-75.7)	–	1	1	1
Yes	730 (69.5)	84.1 (81.5-86.8)	–	2.19 (1.61-2.99)***	2.23 (1.54-3.22)***	2.19 (1.60-3.01)***
<i>Self-evaluated urgency level</i>						
Acute and life-threatening	171 (15.4)	83.6 (78.1-89.2)	–	1	1	–
Acute but not life-threatening	656 (59)	83.2 (80.4-86.1)	–	0.97 (0.62-1.53)	1.13 (0.69-1.87)	–
Not acute and not life-threatening	285 (25.6)	82.8 (78.4-87.2)	–	0.94 (0.57-1.57)	1.30 (0.72-2.33)	–
<i>Geography</i>						
Eastern part of Region of Central Jutland	975 (71.6)	80.5 (78.0-83.0)	–	1	1	–
Western part of Region of Central Jutland	230 (16.9)	85.7 (81.1-90.2)	–	1.45 (0.97-2.16)	1.34 (0.78-2.31)	–
Other parts of Denmark	157 (11.5)	82.2 (76.2-88.2)	–	1.12 (0.72-1.73)	1.27 (0.68-2.35)	–

CI = confidence interval; SD = standard deviation.

*) p < 0.05; **) p < 0.01; ***) p < 0.001.

a) % of responding patients who answered "Very good".

b) Adjusted for gender, age, respondent, evaluated urgency level, response time, mobile emergency care unit, information about expected response time, self-evaluated urgency level and geography. 7.9% of the searches are explained (Nagelkerke) (N = 880).

c) Adjusted for age, evaluated urgency level and information about expected response time (backward likelihood ratio). 7.0% of the searches are explained (Nagelkerke) (N = 1,051).

TABLE 2

Parts of 1-1-2 patients with a "non-problem score" on the overall question (95% confidence interval). ^a Related to self evaluated urgency and evaluated urgency. Question: What was your overall impression of your contact with the ambulance service?

Self-evaluated urgency level	Information about expected response time				Total	
	yes		no		level A ^b	level B ^b
	level A ^b	level B ^b	level A ^b	level B ^b		
Acute and life-threatening, %	90.0 (83.8-96.2)	73.7 (53.3-94.0)	70.0 (53.3-86.7)	72.7 (45.1-100.3)	85.0 (78.6-91.4)	73.3 (57.2-89.4)
n	90	19	30	11	120	30
Acute but not life-threatening, %	88.8 (84.7-92.9)	82.2 (75.5-88.8)	77.5 (69.3-85.6)	65.5 (52.8-78.1)	85.3 (81.5-89.1)	77.2 (71.1-83.3)
n	232	129	102	55	334	184
Not acute and not life-threatening, %	78.6 (68.9-88.3)	92.7 (87.0-98.4)	80.0 (67.4-92.6)	70.0 (49.4-90.6)	79.1 (71.5-86.7)	88.2 (82.0-94.5)
n	70	82	40	20	110	102
Total, %	87.2 (83.9-90.5)	85.2 (80.6-89.8)	76.7 (70.4-83.1)	67.4 (57.5-77.4)	84.0 (81.0-87.1)	80.4 (76.0-84.8)
n	392	230	172	86	564	316

EMD = emergency medical dispatch centre.

a) Parts of responding patients who answered "Very good".

b) EMD-evaluated urgency level.

pronounced death was checked. In the original study, 6,535 questionnaires were sent of which 60% were returned [6].

The questionnaire

The questionnaire was designed in cooperation with the regional prehospital emergency services. Inspiration was drawn from accreditation system standards [7] and from a former study performed in the Region of Central Jutland [8].

Cognitive interviews were performed with 16 patients and three relatives from three hospital units [9]. A pilot study was conducted among 1,398 patients. Three types of answering categories were tested to prevent the well-known ceiling effects in such studies [10]. Data from the pilot study are not included in the present study.

The questionnaire included one question about the overall impression, 13 specific questions, five open-ended questions [11] and six background questions. The overall question was answered on a four-point scale: "Very good", "Good", "Poor" and "Very poor". The specific questions were answered by selecting one of the following options: "Definitely", "To some extent", "Not particularly", "Not at all" and "Not sure/not applicable".

The questionnaires were in Danish and were distributed by mail. The questionnaire was also translated into English (and back-translated). The English version was made available electronically and this was mentioned in the accompanying letter.

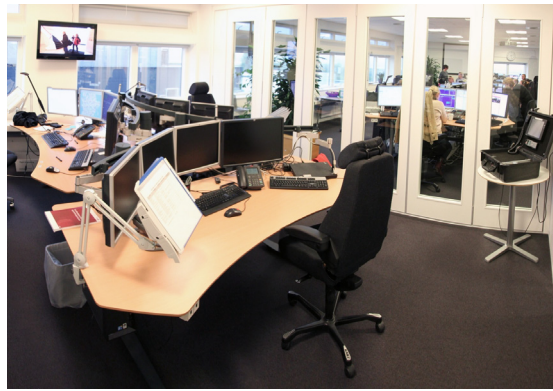
Information from the survey was linked with information from the registration system: response time, level of urgency, geographical area, EMD medical visitation and whether a MECU was sent.

Inclusion criteria

The original study was focussed on all patients with emergency level A, B or C (February 4th to March 24th 2012). In this article, we focus on and include only those 1-1-2 patients who went through the EMD medical visitation and for whom an ambulance was sent. Medical visitation means that the patients are triaged on the basis of the telephone call with a health-care professional who delivers counselling and prioritizes the patients' needs according to the Danish Index.

Analysis

The patients' answers were dichotomised into "problem scores" and "non-problem scores" [12]. A "problem score" is the percentage of patients giving all but the best evaluation possible. The relevance of this technique can further be supported by studies that argue that even positive answering categories often contain elements of critique if they are not the most positive response option [12].



The emergency medical dispatch centre.

The patients' overall impression of the prehospital care was analysed in logistic regression models presenting both adjusted and unadjusted odds ratios. Background variables and specific items were used as independent variables. Variables were selected on a theoretical basis and based on analysis of variations. The final model in **Table 1** was established through backward elimination of non-contributing variables. The remaining variables are subsequently included in all adjusted models. For more details, see Table 1.

The odds ratios show the association between each item and the patients' overall impressions. Both adjusted and unadjusted ratios were calculated [13]. Combinations of the "non-problem scores" and the calculated odds ratios were interpreted as an indicator of areas with most potential for improvement seen from the patients' perspective [12].

Trial registration: not relevant.

RESULTS

A total of 6,770 1-1-2 calls were received by the EMD in the inclusion period, and ambulances were sent in 5,219 cases. After excluding deaths, duplicate values, and patients with research protection, 2,463 patients were included and 1,419 patients (response rate 58%) answered the questionnaire. The sample is representative in terms of response and non-response with a tendency towards more answers from females, elderly patients and patients with a high urgency level.

Overall impression

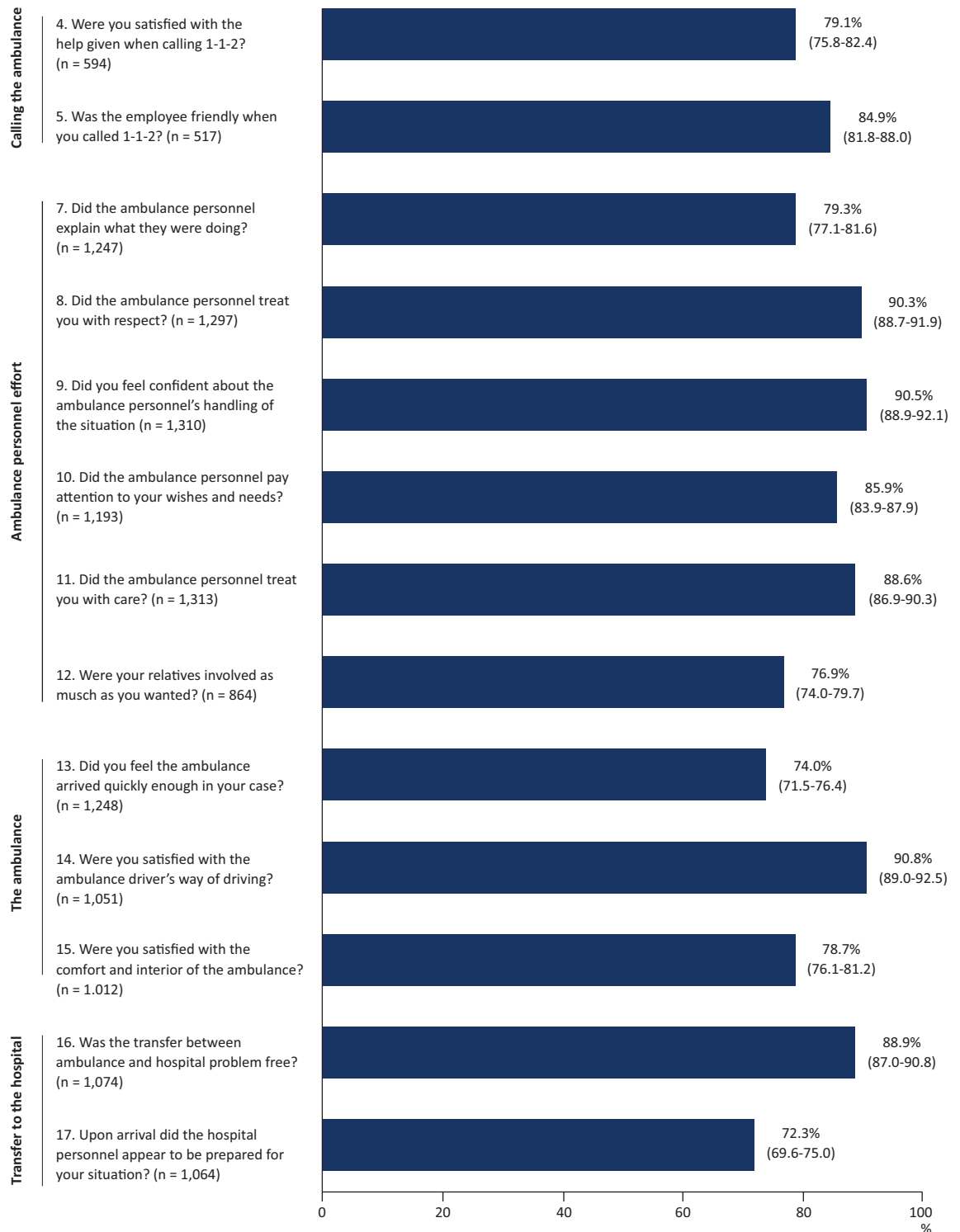
Overall, 82% of the patients characterised their impression of the contact with the prehospital service as "Very good" and 16% characterised it as "Good".

The overall impression depended on the patient's age, EMD-evaluated urgency and information given about expected response time. These results remained valid for the adjusted odds ratios.

Table 2 shows the "non-problem scores" for the


FIGURE 1

Specific questions about prehospital emergency care. Percentages of 1-1-2 patients with "non-problem scores" (95% confidence interval).
 a) Percentages of responding patients who answered »Definitely«.



overall question in terms of evaluated urgency and the patients' experience of having received information about response time. The answers were further specified with reference to the patients' own judgement of

the urgency level. More positive answers were given when patients were informed about the expected response time and when the EMD-evaluated urgency and the patients' self-evaluated urgency concurred.



TABLE 3

Association with overall impression and percentages of 1-1-2 patients with a “non-problem score” on 13 specific questions on prehospital emergency care. Sorted by association (adjusted odds ratios). Ambulance personnel includes all prehospital personnel at the site of damage e.g. doctors and nurses from mobile emergency care units.

	Odds ratio (95% CI)		Non-problem score, % (95% CI) ^c
	unadjusted ^a	adjusted ^{a, b}	
9. Did you feel confident about the ambulance personnel's handling of the situation?	6.24 (2.93-13.33)***	6.51 (2.77-15.30)***	90.5 (88.9-92.1)
10. Did the ambulance personnel pay attention to your wishes and needs?	3.27 (1.59-6.72)**	3.74 (1.70-8.23)**	85.9 (83.9-87.9)
4. Were you satisfied with the help given when calling 1-1-2?	4.69 (1.47-15.01)**	2.99 (0.90-9.93)	79.1 (75.8-82.4)
14. Were you satisfied with the ambulance driver's way of driving?	2.34 (1.09-5.01)*	2.58 (1.14-5.87)*	90.8 (89.0-92.5)
7. Did the ambulance personnel explain what they were doing?	1.76 (0.96-3.20)	1.98 (1.04-3.80)*	79.3 (77.1-81.6)
12. Were your relatives involved as much as you wanted?	1.90 (0.95-3.80)	1.94 (0.92-4.13)	76.9 (74.0-79.7)
16. Was the transfer between ambulance and hospital problem free?	2.00 (1.01-3.98)*	1.83 (0.87-3.85)	88.9 (87.0-90.8)
13. Did you feel the ambulance arrived quickly enough in your case?	2.47 (1.49-4.08)***	1.71 (0.97-2.99)	74.0 (71.5-76.4)
5. Was the employee friendly when you called 1-1-2?	1.47 (0.41-5.27)	1.65 (0.46-5.96)	84.9 (81.8-88.0)
15. Were you satisfied with the comfort and interior of the ambulance?	1.53 (0.86-2.74)	1.64 (0.89-3.03)	78.7 (76.1-81.2)
17. Upon arrival did the hospital personnel appear to be prepared for your situation?	1.90 (1.11-3.25)*	1.64 (0.92-2.93)	72.3 (69.6-75.0)
8. Did the ambulance personnel treat you with respect?	1.40 (0.58-3.42)	1.19 (0.43-3.27)	90.3 (88.7-91.9)
11. Did the ambulance personnel treat you with care?	1.22 (0.54-2.75)	1.07 (0.43-2.69)	88.6 (86.9-90.3)

CI = confidence interval.

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$.

a) Multivariate logistic regression model with all items except for items 4, 5 and 12. Due to few answers the odds ratios for item 4, 5 and 12 were found in two separate multivariate models.

b) Adjusted for age, dispatched urgency level and information about expected response time. 48.3 % of the searches are explained (Nagelkerke) (N = 638).

c) Percentages of responding patients who answered »Definitely«.

Patients' perceived urgency level would differ from EMD-evaluated urgency level in both directions. In addition, the table shows that the patients' perceived level of urgency was often lower than the urgency level formally evaluated by the EMD.

Specific questions

Figure 1 shows the “non-problem scores” for the 13 specific questions. The confidence intervals indicate on which questions the “non-problem scores” differ statistically. The best scores were observed in connection with the way the ambulance was driven (91%), confidence in the ambulance personnel's (including prehospital nurses and doctors) handling of the situation (91%) and the respect shown by this personnel (90%). In the questionnaire, only the broad term “ambulance personnel” was used which included all prehospital personnel because the pilot study demonstrated that patients did not distinguish between the various prehospital professions.

The lowest “non-problem scores” were those associated with the hospital personnel's apparent preparedness upon their arrival to hospital (72 %), the item allowing respondents to state if they felt that the ambulance arrived quickly enough (74%) and their experience concerning sufficient involvement of relatives (77%).

The evaluated urgency levels were significantly correlated with five of the 13 specific items: the help given when calling 1-1-2, the kindness when the patient called

1-1-2 (including both the police and the health-care professionals), the patient's perception of being handled with care, the timely arrival of the ambulance, and the hospital personnel's apparent preparedness upon their arrival to hospital. For all five items, the “non-problem scores” were higher among patients with urgency level A than among patients with urgency level B ($p < 0.05$).

Associations among specific questions and the overall impression

In Table 3 the “non-problem scores” and their association with the overall impression (odds ratios) are shown for the 13 specific items. The questions which were highly associated with the overall impression and characterized by low “non-problem scores” are: the assistance provided when calling 1-1-2, the ambulance personnel's ability to explain what they were doing and the involvement of relatives in accordance with the patients' needs.

DISCUSSION

The study shows that patients have a very positive attitude to the prehospital care related to criteria-based medical dispatch of ambulances. 82% of the patients gave a “non-problem score” on the overall item. The overall impression among patients with urgency level A was significantly better than the impression among patients with urgency level B. In another region in Denmark, only 72 % of the answers in a survey on emer-



The mobile emergency care unit.

gency care had a “non-problem score”. In that study, the primary problem for the patients was emphasised to be the transfer of patients from the ambulance to the hospital [14].

The analysis in our study revealed that the issues most associated with the patients’ overall impressions were: that the patients feel that the prehospital personnel are able to handle the situation and that the prehospital personnel pay attention to the patients’ wishes and needs. These two issues enjoyed very positive answers from the patients and were highly associated with overall satisfaction.

The study also indicated important areas for improvement. The patients have important reservations with regard to the experience of having received help when they called 1-1-2 (including the police and the health-care professionals at the EMD). The survey can only tentatively indicate why this is the case. Reading the comments from the patients concerning their 1-1-2 call reveals that the circumstances of the calls vary greatly. Specific critical-patient comments mention unexpected waiting times when calling 1-1-2, and state concern that help might be delayed as patients have to talk with both the police and the EMD.

Furthermore, some have experienced several irrelevant standard and often repeated questions made by the police and then by the EMD, and, finally, some report having to argue strongly for an ambulance to be dispatched.

Our study shows that prioritising urgency levels is associated with the overall impression and on the following parts of the Prehospital care: in the 1-1-2-telephone, in the ambulance, and arriving at the hospital. It is, however, important to notice that the association with level of urgency seems to disappear if the patient is

well informed about the expected response time. In this respect, the study indicated that expectations have a substantial effect on patient satisfaction. The expectations seem to be formed both from the expected response time and from concordance between the patients and the EMD concerning the right urgency level. Theory about partnership can thereby play a crucial role in meeting the patients’ needs [15, 16].

The present study has methodological limitations. The study is only based on patients who called 1-1-2 and were allocated an ambulance. Patients not allocated an ambulance were not asked. This might imply an overestimation of the level of patient satisfaction. The experience of the patients for whom an ambulance was not dispatched is a subject for future studies to further qualify the effects of the EMD. However, only part of these can be identified due to lack of information about patient identity.

Even though it is emphasised that good prehospital care is based on much more than a fast response [17], many patients do find that response time is important. The study showed that it was primarily patients with urgency level B who experienced that the ambulance did not arrive fast enough. This is a logic consequence of prioritizing, but it also supports the importance of an effective medical dispatch of ambulances. It is not enough to prioritize effectively from a professional point of view. It is also important to leave the patients with an understanding of the assessed urgency level. On this issue, answers from the patients underpin the ideas about shared decision-making [18] because patients welcome more explanations about what the prehospital personnel is doing and they would prefer more involvement of their relatives [19].

CONCLUSION

This study shows that patients have a very positive attitude to the prehospital care with criteria-based medical dispatch of ambulances. The overall impression of patients with urgency level A was significantly better than that of patients with urgency level B. The issues with most potential for improvement are: the assistance provided when calling 1-1-2 (first answered by the police and then the medical personnel), the prehospital personnel explaining what they were doing, the involvement of relatives and better information about expected response time of ambulances.

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