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Patient Decision Making in Prehospital Health Emergencies: Determinants and Predictors of Patient Delay

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Abstract:

Background: Previous research has identified that cardiac patients tend to delay seeking help for chest pain. This study examined whether help-seeking delay occurred in all health emergencies, and explored what people are doing while they delay. This study also explored patient decision making processes and behaviours that determine how long it takes patients to seek emergency help.

Methods: This study used a self administered survey, including the Coping Responses Inventory. Participants were a random sample of emergency department attendees, stratified for urgency (high vs medium–low) and mode of transport to the hospital emergency department (ambulance vs other). Additional in-depth patient interviews were also conducted.

Results: Survey responses showed the median delay from symptom onset to arrival at health care was 4.6 hours. Discriminant Function Analysis identified that gender, pain and coping style predicted delay.

Conclusions: This study identified that delay is not unique to cardiac emergencies. A process of decision making was undertaken which was common to many health emergencies involving a conscious patient, the outcome of which determined how long each patient took to seek help. Psychosocial, normative and affective factors such as coping style drove patient decisions during a health emergency. The knowledge that patients make decisions in a health emergency *based on what they feel, not on what they know* is a breakthrough in the understanding of patient motivations to seek medical help in health emergencies, and may explain why traditional patient education using an informative approach has had only limited success.

Keywords: patient delay, decision making, behaviour, ambulance, emergency medicine

Introduction

The decisions made during a health emergency can directly affect a patient's chances of survival. When a health condition unexpectedly becomes life threatening, the patient or a bystander may need to recognise a health emergency and promptly seek medical help. The importance of patients' decisions during health emergencies was first investigated in the 1970s, when it was noted that almost 50% of patients delayed seeking medical help for an Acute Myocardial Infarction (AMI) for up to four hours.[1] In response to the time criticality of treatment for AMI, the 'chain of survival' concept was introduced in the 1980s.[2,3] The chain of survival process of optimal treatment for AMI and cardiac arrest patients was;

- early access to emergency medical systems,
- early CPR,
- early defibrillation and
- early advanced medical care.

Therefore hospital and ambulance systems were optimised, in-hospital triage was speeded up and health professionals' knowledge of cardiac arrest symptoms was improved.[4,5] The availability of life saving thrombolytic drugs was increased,[6] and hospital emergency departments were made aware of the importance of early treatment for AMI and cardiac arrest.[7] Despite these initiatives, almost 20 years later, there had been minimal reduction in delay[8,9] within AMI populations, with patients still delaying six hours on average.

The chain of survival process was reassessed, and 'early recognition and response' were added as key first links in the chain.[10] Patients' lack of recognition and/or prompt response to a health emergency weakens the remaining links in the chain of survival so patients will continue to have poor health outcomes.[11] An article on prehospital treatments for AMI, however, illuminated the lack of conclusive research to improve patient recognition and response, and concluded:

"…most of the delay occurs before the patient contacts the ambulance service. However, no strategy has been identified that encourages patients to present earlier…" [12]

The finding that education strategies were unable to reduce delay in patient help seeking in AMI was supported by a Cochrane review of educational interventions to reduce help seeking delay.[13] Nor does personal experience change responses, patients with a history of AMI delay seeking medical help longer in a subsequent AMI than previously,[14] which may suggest that patients have either not understood the medical urgency from their previous health emergency experience, or that they found the experience so aversive they would risk death to avoid it. Patients with chest pain continue to delay seeking help and to avoid ambulance use.[15-17]

Although the chain of survival concept was developed for cardiac arrest and AMI, delay is not unique to AMI patients. Research has also shown that asthma patients generally do not seek appropriate medical help until symptoms become life threatening.[18-20] Even when patients with chronic asthma are taught to recognise important symptoms and respond in a health emergency, they do not act appropriately in the event.[21] The research evidence demonstrating delays in seeking medical help generates many questions about patients' recognition and understanding of a health emergency and the actions they need to take at the time and suggests that help-seeking delay is not specific to cardiac emergencies.

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This study therefore aimed to investigate patient help-seeking behaviours in a range of patient perceived health crises, to identify what patients do in a perceived health emergency, and how this affects the length of time before they seek health care.

Methods
This study combined a questionnaire to Emergency Department (ED) attendees with patient interviews and health professional focus groups. Ethics approval was received at all study locations.

Questionnaires were sent to 600 patients selected from ED attendance records from three large metropolitan hospitals. Questionnaire participants were selected to include both high and low triage scores, and both ambulance/non ambulance patients. The questionnaire comprised 98 questions and was divided into four sections; demographics, recent emergency health experience and including two self administered standardised psychological tests: Multidimensional Health Locus of Control (MHLOC)[22] and Coping Responses Inventory (CRI). [23]

The MHLOC assesses internal versus external health locus of control. The MHLOC is a standardised psychological test, suitable for a grade six reading age and for self administration. The format for questions is a six point Likert scale, ranging from strongly disagree[1] to strongly agree[6] and therefore for each of the subscales (internal, external and chance) the scores can range from six to 36, with higher scores indicating higher levels of belief that their health experiences are controlled by internal (self based), external powerful others (such as health professionals) or chance sources (such as fate, supernatural or religious entities). An example of an internal locus of control question is "If I take care of myself, I can avoid illness".

The CRI contains 48 questions which identify levels of each type of coping response to the health emergency. The CRI has been used successfully in other studies of emergency health experiences.[24-26] The CRI evaluates the both the focus of coping efforts and the method of coping. This is demonstrated below in Table 1.

Table 1: Summary of coping styles assessed by the Coping Responses Inventory

		Coping Effect	
		Approach	**Avoidance**
Coping Method	**Cognitive**	Logical Analysis, Positive Reappraisal	Cognitive Avoidance, Acceptance or Resignation
	Behavioural	Seeking Guidance & Support	Seeking Alternative Rewards
		Taking Problem Solving Action	Emotional Discharge

As shown in Table 1, the focus of coping efforts is either considered to be 'approach coping', where the person tries to resolve the situation, or 'avoidance coping', where the person avoids dealing with the situation and instead focuses coping efforts on managing the associated emotions.[27]

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The method of coping can be considered either primarily cognitive, where the person responds to the situation by thinking, or using emotional processes, where the person responds to the situation using behavioural strategies, by actively seeking a solution.

Results

Of the 600 questionnaires, 88 were returned due to change in address, intended participant was deceased or unable to participate. Of the remaining 512 intended participants who received a questionnaire, there were 177 responses, resulting in a 34.5% response rate. Of these responses, 14 were less than half completed and were removed from all analysis. Therefore a total of 163 questionnaires were included in the questionnaire data analysis. Response rates from each cell of the stratified sample used for patient group recruitment are shown in Table 2.

**Table 2: Response rates within selected categories of stratified sample**

	Triage Category 1-2 (High)	Triage Category 3-5 (Medium - Low)	Total
Came via Ambulance	54 (33%)	48 (29%)	**102 (62.5%)**
Came via Own Transport	39 (24%)	22 (14%)	**61 (37.5%)**
Total	**93 (57%)**	**70 (43%)**	**163 (100%)**

The response rates were significantly higher from patients who used ambulance services than those who self transported ($p<0.05$). Although the response rates were lower than desired for within each cell, there was sufficient data overall to make meaningful comparisons between groups.

Delay Time

Respondents' statements about help seeking delay were calculated in minutes from the time they reported that their symptoms started to the time they reported calling an ambulance or arriving at a hospital emergency department. Figure 1 below demonstrates a distinctively grouped population at above and below one hour help-seeking delay. Median delay time was one hour.

Figure 1: Delay time distribution
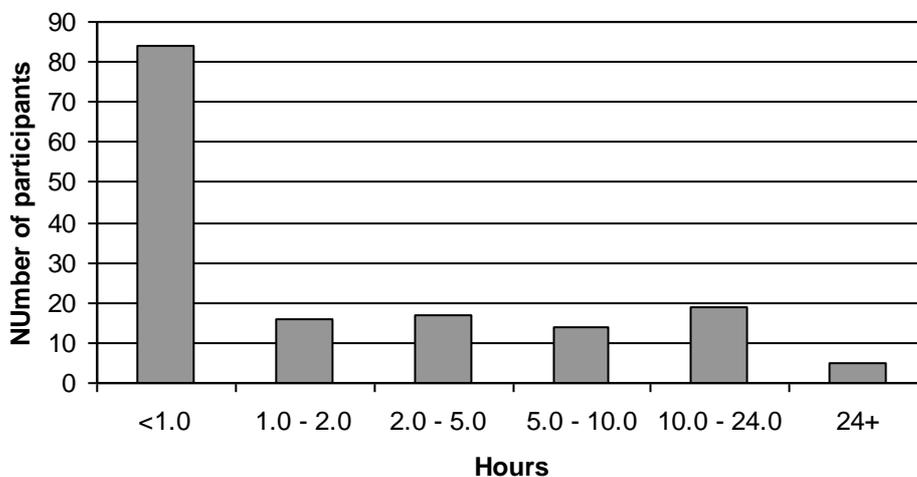
The distinctive grouping at above and below one hour help-seeking delay division was also evident in the *mean* delay for each group, where the mean delay for those who delayed less than one hour was 23 minutes, whereas the mean delay for those who waited more than one hour was eight hours and 43 minutes, suggesting that people either delay less than one hour, or much longer than one hour.

As shown in Table 3, delay was not unique to cardiac related symptoms.

Table 3: Relationship between delay length and symptoms

Symptom Category	N	Number of cases who delayed less than one hour (%)	Maximum delay length (hours)	Average Delay length Hours (SD)
Cardiac	48	14 (29.1)	31.00	4.76 (6.9)
Respiratory	12	8 (66%)	32.50	4.32 (9.6)
CNS	12	9 (75%)	11.00	1.81 (3.2)
GI	22	8 (36%)	30.50	6.60 (8.0)
Trauma	32	21 (65%)	28.50	4.25 (7.7)
Other	13	10 (77%)	24.00	3.97 (7.2)
TOTAL	**139**	**69 (49.6%)**	**32.50**	**4.56 (7.3)**

A Discriminant Function Analysis (DFA)[28] involves methodically entering and removing variables into an equation to determine which combination of variables creates the strongest predictability of an outcome. This analysis used a DFA to test which variables could be used to predict which people sought medical help within one hour, and which people delayed seeking medical help for more than one hour. Statistical analysis used SPSS for Windows version 12.0.

The DFA used a combination of variables including demographic (age, gender, health insurance status, education and occupation), clinical (ATS score, ambulance use, patient reporting of pain, region of body affected, medical classification of type of case) and psychosocial variables (who called the ambulance, first time symptoms experienced, who the patient contacted first, health locus of control, and coping style) to predict group membership. All independent variables were entered simultaneously to obtain a standard discriminant function analysis.

The single discriminant function shown in Table 4 successfully separated the two groups (Wilks χ^2=22.2, p<0.005). Using this discriminant function with the original data, these variables predicted 62% of group membership (delay less than or greater than one hour) correctly, which is a strong result. Correlations between independent variables and the discriminant function are shown below in Table 4, which shows that the coping style variables loaded heavily on the discriminant function.

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Table 4: Correlations between the independent variables and the discriminant function

Variable	r value (correlation between variable and function)
Problem solving coping style	0.591
Cognitive avoidance coping style	0.559
Arrival method (ambulance or own transport)	0.489
Gender	0.485
Resignation coping style	-0.338
Patient reported pain	-0.380
Positive reappraisal coping style	-0.695

The variables that discriminated between the group who delayed seeking medical help for more than one hour showed that they were more likely to:

- use problem solving and cognitive avoidance coping styles,
- arrive via their own transport
- be female, and,
- report experiencing pain

and less likely to;

- have arrived at ED via ambulance
- to use resignation and positive reappraisal coping styles;

than those who sought medical help within one hour.

Variables that did not discriminate between people who delayed seeking medical help for more than one hour included;

- Triage category allocated by the hospital (Australasian Triage Score)
- Education level
- Health insurance status
- Symptoms experienced
- Age
- Who called the ambulance
- Who the patient contacted
- Whether the patient was experiencing symptoms for the first time; or
- Health locus of control.

Discussion
This study explored the decision making processes that patients followed in a health emergency in the out-of-hospital setting, and explored the nature of help seeking delay. The questionnaire data showed that people either delayed less than one hour, or significantly greater than one hour, and that delay was not unique to cardiac emergencies.

The people who delayed longer were more likely to combine the two coping styles 'problem solving' with 'cognitive avoidance', and were more likely to be female. The combination of these two coping styles means that the people who delayed had the right attitude – taking problem solving action by choosing a course of action and following it, but the wrong way of thinking – they avoided thinking any further about the consequences of the problem. The short answer section of the questionnaire indicated that many people self medicated as an initial response to the health emergency, and that once they had chosen a course of action, they refused to think about other aspects of the health emergency. Instead they hoped that the

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problem would resolve as a consequence of their problem solving action. This combination contributes to the delay to seeking emergency medical help.

The people who did not delay were more likely to use ambulance services and use resignation and acceptance or positive reappraisal coping styles. The combination of acceptance resignation and positive reappraisal coping styles meant that patients responded to the health emergency by accepting their fate and acknowledging their limited control over the situation, but also by thinking about the experience in a positive light, identifying that things could be worse. The difference between delayers and non delayers was demonstrated most markedly in their coping styles. Those who delayed had more positive and adaptive coping styles; but these led to a tendency to self manage, and subsequently delay.

The knowledge that patients make decisions in a health emergency *based on what they feel, not on what they know* is a significant development in understanding of patient motivations to seek medical help or avoid seeking in health emergencies, and may explain why traditional patient education strategies to change health decision making behaviours have had only limited success.

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