ORIGINAL ARTICLE

A population follow-up study of patients who left an emergency department without being seen by a medical officer

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Objectives: To describe the population of emergency department patients who leave without being seen by a medical officer, to investigate the circumstances of their visit and to ascertain whether they subsequently receive alternative medical care.

Methods: A follow-up study was conducted of patients who were initially triaged, but left without being seen by a medical officer between July 2003 and October 2003 in a tertiary referral hospital emergency department in Sydney, Australia. Emergency Department Information System data were reviewed for population demographics, presenting complaints and acuity rating of patients. Follow-up telephone interviews were conducted within 7 days after the patient left the emergency department.

Results: During the study period, 8.6% (1272 of 14 741) of the emergency department patients left without seeing a doctor and 35.9% (457 of 1272) of these patients who walks out were contacted for follow-up. The results from bivariate and multivariate analyses showed that walkout rates significantly varied by sociodemographic and clinical characteristics of the patients. Young patients aged 0–29 years, and those with longer waiting time for triage and triaged as ''less urgent'' were more likely to walk out than others. Overcrowding in the emergency department had a significant association with walkout of patients. Prolonged waiting time was the most common reason for leaving emergency departments without being seen by a doctor. Only 12.7% (58 of 457) of the walkout patients revisited emergency departments within 7 days of their departure and of those who were subsequently admitted following their return to hospital accounted for 5.0% (23 of 457). Of the follow-up patients, 39.4% felt angry about their emergency department experiences.

Conclusions: The number of patients who leave an emergency department without seeing a doctor is strongly correlated with waiting time for medical review. Achieving shorter emergency department waiting times is central to reducing the numbers of people leaving without being seen. The rate of patients who leave without being seen is also strongly correlated with triage category. These findings highlight the importance of accurate triaging, as this clearly influences waiting time. It is also likely that there are patients who benefit from the reassurance of the triage assessment, and therefore feel less urgency for medical review. These may be cases where immediate medical review is not essential. This area should be further explored. These results are important for planning and staffing health services. Decision makers should identify and target factors to minimise walkouts from public hospital emergency departments.

A substantial number of patients who attend public hospital emergency departments for emergency medical care are triaged, then leave without being seen (LWBS) by a doctor.[1–8] From a service delivery perspective, these LWBS patients are an important group because of their potential for experiencing adverse outcomes.[1 3 5 9–11] Many LWBS patients could not identify an alternative source of healthcare and might miss out on needed treatment.[1 2]

There are few studies targeting the subpopulation of LWBS patients owing to their hard-to-reach status. Estimates range from 0.4% to 15% of emergency department patients.[3 5 6–9 12] The severity of illness among LWBS patients has been described as high with half of the LWBS patients estimated to need immediate or urgent medical evaluation.[1] One study in the USA found that 11% of LWBS patients were hospitalised within a week of their leaving.[2] In a Canadian study, 48% of this type of patient sought alternative medical attention within 24 h of leaving.[11] Sainsbury[13] found that 44% returned for care at the emergency department or any other outpatient clinic within 7 days of their LWBS visit. Dissatisfaction with the duration of waiting time was the most common reason for LWBS.[1 5 11 14–16] Studies also reported that patients were less likely to walk out during the day and more likely to walk out after hours or at the weekend.[3 6–8 10 11 15]

Several Australian studies have documented the characteristics of patients who leave an emergency department without being seen by a doctor.[3 6–8 16] Most of these previous studies were limited to examining the association of sociodemographic characteristics and urgency of presentation with the walkout of patients from emergency departments.[6–8] However, none of this research had followed up patients after they left emergency departments without treatment. This paper explores the characteristics of patients who left an emergency department without being seen by a doctor at a tertiary principal referral hospital and follows-up the walkout patients after 7 days by telephone, to identify the reason for walkout, and health services utilisation after the emergency department visit.

METHODS

This population-based follow-up study was part of a large emergency department project funded by the Australian Health Minister Advisory Council.[17] It was conducted in a teaching hospital in New South Wales. The design was an observational study using a consecutive sample of emergency department

attenders between 7 July 2003 and 31 October 2003. All patients (including LWBS patients) registered with the emergency department were included in this study. Patients were identified as LWBS through the Emergency Department Information System, and were linked with the Emergency Department Information System system by deterministic matching. All LWBS patients, defined as those who registered but were not been seen by a doctor, were followed-up by telephone 7 days after visiting the emergency department. In an attempt to contact all the LWBS patients, up to five calls were made during and after working hours, and at weekends. The local ethics committee approved the follow-up project.

Statistical analysis

First, the prevalence of LWBS was examined by patients' age, sex, arrival status, triage category and ethnicity. Second, from the follow-up data, this study explored the LWBS population for factors including: main reasons for walkout, re-presentation to emergency department, admission to hospital, health services utilisation after the emergency department visit and the patient's recommendations for reducing the problem of LWBS.

Selected characteristics (age, gender and severity of illness) for those LWBS patients who were unable to be contacted by phone were compared with those who were contacted. Univariate association of those explanatory variables was evaluated by descriptive statistical techniques, such as χ^2 test for appropriate data. Multiple logistic regression analysis explored the independent contribution of each potential explanatory variable on walkout of patients, adjusting for other variables.[18] The odds ratios (ORs) from logistic regression analysis with their 95% Confidence Interval (CI) are shown to express the likelihood of walkout for each explanatory variable adjusted for the effects of other variables. Only those factors found to be significant in descriptive analyses are included in the forced entry multiple logistic regression model. As language spoken at home and interpreter services needed are highly correlated, and to deal with the problem of potential multicollinearity,[19] only the language spoken at home was included in the multiple logistic regression model.

RESULTS

General characteristics of the emergency department patients

During the study period, a total of 14 741 emergency department presentations were registered and of these, 1272 (8.6%) LWBS. Among the LWBS patients, 457(35.9%) were contacted for follow-up information and the remainder could not be contacted despite multiple attempts being made.

Table 1 shows the sociodemographic and other characteristics of all the emergency department patients attending during the study period and association of LWBS with these factors. Patient attendances were evenly distributed between day (08:00 to 16:00) and evening (16:00 to 24:00)—41.6% and 41%, respectively—and 30.3% arrived during the weekend. Most of the total emergency department patients attending during the study period were classified in triage categories as ''potentially life threatening'' (52.7%), followed by ''potentially serious'' (34.4%).

Factors associated with LWBS

The prevalence of LWBS significantly ($p<0.05$) varied according to patients' age, language spoken at home, need for interpreter services, urgency of presentation (triage category), and time and day of arrival (table 1). The multiple logistic regression analysis showed that patients' urgency, age and time of arrival had relatively strong associations with LWBS. Parents/custodians of children aged 0–4 years were 2.5 times more likely to walkout than self-presented patients aged ⩾45 years. The results also showed that the walkout rate for children aged 0–4 years was higher than that for children aged 5–14 years (11.9% vs 10.9%).

Native English speaking patients had higher rates of LWBS than the patients with a non-English speaking background, and this was consistent with a higher rate of LWBS for patients not needing interpreter services. The pattern of LWBS varied by arrival time, with a higher rate of LWBS reported during the night shift. Triage category (urgency of presentation) showed a linear relationship with walkout rates, with increased likelihood of walkout as urgency decreased (table 1). The patients who were triaged as ''less urgent'' were 11 times more likely to leave emergency departments without treatment than patients with potentially life-threatening disease. The correlation coefficient between the number of patients who arrived each day and the rate of daily walkout indicated that overcrowding in the emergency departments was associated with the walkout rates of patients ($r = 0.551$, $p<0.01$).

Follow-up patients

Age, gender and urgency (triage category) information for the LWBS patients who were followed up (n = 457) was compared with those who could not be contacted (n = 815). The characteristics for those unable to be followed up were similar to those who were contacted. Of those followed up, 55.6% were men, 25.8% children (0–4 years), 25.8% had potentially life threatening disease and the corresponding rates for those who could not be followed up were 55.6%, 20.4% and 24.0%, respectively.

Of the 457 follow-up patients, the main reported reasons for having attended the emergency department were injury, followed by pain and viral infections (table 2). Prolonged waiting time was the most common reason (63.8%, 268 of 420) for leaving emergency departments without being seen by a doctor. Of these 268 patients, 75% (n = 201) were triaged as ''potentially serious'' or ''less urgent'' (Australian Triage Scale categories 4 and 5), and the Australasian College for Emergency Medicine recommended maximum waiting time for this group of patients was 60–120 min.

Of the follow-up patients, 39.4% (164 of 416) felt angry about the emergency department services received (table 2), and 75.6% (124 of 164) of these left emergency departments owing to the waiting time. Those who left owing to long waiting times were 2.6 times more likely to feel angry about emergency department services than others (OR = 2.57; 95% CI 1.65% to 4.01%). Men, young adults and patients with less urgent problems were more likely to feel angry than others.

About 64% (n = 290) of the follow-up patients received two or more alternative healthcare services and 8.3% did not receive any services within 7 days of their departure. Of the follow-up patients, 56.9% (n = 260) patients visited general practitioners within 7 days. Of those who visited general practitioners, 25.4% (66 of 260) were triaged as having potentially life threatening disease and 65.8% (171 of 260) were triaged as less urgent (Australasian College for Emergency Medicine category 5). About 12.7% (58 of 457), revisited emergency departments within 7 days of their departure and 5.0% (23 of 457) were admitted to hospital.

When asked how they perceived the problem with the service, 27% (109 of 404) thought that patients should be seen within a minute of arrival and 17.8% within 30 min (72 of 404 patients). Only 18.3% (77 of 420) believed that their problems had not been resolved in the emergency department. ''More staff'' and ''to be seen quicker'' were the main recommendations for reducing the problem of LWBS (table 2).

Table 1 Risk factors for patients leaving without being seen: results from cross-tabulations and multiple logistic regression analysis

Risk factors		Total patients (n)	LWBS (n)	% of total who were LWBS	*Adjusted OR (95% CI)
	All	14 741	1272	8.6	
Age in years	0–4	2383	284	11.9	2.46 (2.03 to 2.98)†
	5–14	1170	128	10.9	1.76 (1.38 to 2.23)†
	15–29	3202	358	11.2	1.96 (1.63 to 2.34)†
	30–44	2809	274	9.8	1.66 (1.38 to 2.01)†
	⩾45 (reference category)	5166	227	4.4	1.00
Sex	Male	7876	707	9.0	Not significant
	Female	6856	565	8.2	Not significant
Language spoken at home	Others (reference category)	2306	175	7.6	1.00
	English	12 431	1097	8.8	1.09 (0.91 to 1.30)
Insurance status	Uninsured	13 089	1134	8.7	Not significant
	Insured	1555	119	7.7	Not significant
Need for interpreter	Not needed	13 938	1242	8.9	Not included
	Needed	794	30	3.8	Not included
Triage category	Resuscitation: immediately life-threatening	211			—
	Emergency: imminently life-threatening	1095	3	0.3	0.06 (0.02 to 0.18)†
	Urgent: potentially life-threatening (reference category)	7755	312	4.0	1.00
	Semi urgent (potentially serious)	5070	775	15.3	4.13 (3.60 to 4.45)†
	Non-urgent (less urgent)	594	175	29.5	10.85 (8.74 to 13.48)†
Days of arrival	Weekday (reference category)	10 415	855	8.2	1.00
	Weekend	4322	417	9.6	1.09 (0.96 to 1.23)
Time of arrival	08:00–15:59 (reference category)	6128	326	5.3	1.00
	16:00–23:59	6040	687	11.4	2.33 (2.01 to 2.69)†
	24:00–07.59	2569	259	10.1	2.02 (1.69 to 2.40)†

LWBS, leave without being seen.
*Adjusted odds ratios were from multiple logistic regression analysis.
†Used as reference category in multiple logistic regression analysis.
−2 log likelihood = 7432.1, model $\chi^2 = 1190.48$, $p<0.001$, 91.4% correctly classified, n = 14 737 (14 723 (99.9%) included in the analysis).

DISCUSSION

This is one of the first large scale studies attempting to follow up all patients who did not wait for treatment in a principal referral hospital emergency department in New South Wales, Australia. In this study, 457 LWBS patients were followed up 7 days after presentation. Those who left before treatment were typically parents with young children, young adults and those who were uninsured. Half of them were categorised by the Australian Triage Scale triage system as having at least a ''potentially serious'' or ''less urgent'' problem. This is consistent with the literature.[3]

In addition, the response rate after extensive follow-up suggests that this subpopulation could be classified as a ''hard to reach population''. Therefore, it is most important to understand this subpopulation better, their characteristics and needs, so that services can be re-designed to meet their requirements better.

Previous research has shown that the main reasons for emergency department walkout have been patient volume and emergency department workload.[1 8 20] This study confirmed these findings by following up a representative sample and asking them about their perceptions. One in eight LWBS patients returned to an emergency department within 7 days, but over a third felt angry about their emergency department experience. Most of them indicated that the problem resolved by itself, but a sizeable proportion visited a general practitioner/chemist or used other health service contacts. Walkout occurred often at night/evening periods, perhaps when staffing ratios were inadequate to meet the demand.[6–8] Patients confirmed that lengthy waiting time was the central issue for them and suggestions included to increase emergency department staffing, to provide frequent updates on waiting time and to improve emergency department waiting room facilities.

This study has found a strong association between triage categories and the risk of leaving without being seen by a doctor. For example, patients classified as having a ''potentially serious'' problem were four times more likely to LWBS than reference category patients (cat 2). Patients with less urgent problems were 11 times more likely to LWBS. Within this group, there may have been patients who were reassured by the triage process, having been advised that their problem was less urgent than they had perceived.

Another important finding of this study is that parents with young children are also more likely to leave. There are various possible explanations for this phenomenon. Firstly, it is known that the admission rate for children is less than that for adults, and that there is an important component of reassurance in these presentations. In future studies, it would be useful to study specifically whether the assessment and reassurance provided by a triage nurse is all that is required by many of these patients, rather than full review by an emergency department medical officer. This type of information will add to our understanding of the various roles the emergency department fulfills in the community, including as a risk-management service. If the parents are reassured that their child will be safe overnight, they are more likely to be happy

Table 2 Reasons for walkout and selected characteristics of walkout patients

	n, n = 457* (%)
Reasons for walkout (n = 420)	
Too long to wait	268 (63.8)
Too many problems associated with waiting	8 (1.9)
Too sick	10 (2.4)
No need—nurse attended to problem	37 (8.8)
Nothing they could do	24 (5.7)
Children left alone at home	5 (1.2)
Problems with staff-communication problem	12 (2.9)
Other	56 (13.3)
Decision to leave affected by triage nurse or any other staff (yes)	76 (16.6)
List of services used after walkout (Within 7 days; multiple response, n = 457)	
Chemist	120 (26.3)
GP	260 (56.9)
Specialist	31 (6.8)
Dentist	8 (1.8)
Mental health	2 (0.2)
Number of any services attended after walkout (within 7 days; n- = 457)	
No services attended	38 (8.3)
One service attended	129 (28.2)
Two services attended	166 (36.3)
Three or more services attended	124 (27.2)
Back to ED (n = 457)	
Yes back to ED	58 (12.7)
Admitted to ED or ward	23 (5.0)
Common reasons for visiting to EDs (n = 393)	
Injury	70 (17.8)
Pain	53 (13.5)
Viral infection	36 (9.2)
Fever	35 (8.9)
GI symptoms-fluid balance	26 (6.6)
Infection	26 (6.6)
Asthma	19 (4.8)
Blood problems	16 (4.1)
Fractures	11 (2.8)
Chest pain	10 (2.5)
Bowel complaints	8 (2.0)
Others	91 (23.2)
Feeling angry about ED services (n = 416)	
Strongly agree	91 (21.9)
Agree	73 (17.5)
Neither agree or disagree	47 (11.3)
Disagree	107 (25.7)
Strongly disagree	98 (23.6)
Problem resolved in emergency department (n = 420)	
Strongly agree	108 (25.7)
Agree	166 (39.5)
Neither agree or disagree	69 (16.4)
Disagree	48 (11.4)
Strongly disagree	29 (6.9)
Recommendation to reduce walkout (n = 420)	
More staff needed	18 (4.3)
Seen quicker	271 (64.5)
Telling people how long the wait would be	6 (1.4)
Specialist staff available	7 (1.7)
Other	118 (28.1)
Recommendation for improvement (n = 413)	
More doctors-staff-nurses	192 (46.5)
Have section for less serious things	17 (4.1)
Nothing to add	112 (27.1)
Method of letting people know how long they have to wait	9 (2.2)
People with colds should not be seen in emergency department	2 (0.5)
No problems-happy-no changes	3 (0.7)
No comments	30 (7.3)
Complex response-cover multiple issues	48 (11.6)

ED, emergency department; GI, gastrointestinal; GP, general practitioner.
*Owing to exclusion of not stated cases where no answer was received the total may not add up to 457.

about waiting to see a community practitioner the next day. Ideally, this type of encounter would be recognised as a completed service episode, (with no immediate requirement for medical review), and counted separately from true LWBS episodes, which may represent a failure to provide a service.

Secondly, it is likely that parents of young children are less able to wait for long periods, especially at night, and particularly if there are other children requiring their care. Patients in general are likely to have less tolerance for waiting at night as they need to sleep before work or care responsibilities the following day.

Our findings linking LWBS rate with knowledge of the English language raises some other important issues. This may reflect a lack of access to, or knowledge of, alternatives to emergency department care, or possibly a cultural acceptance of attending hospital as a first port of call for healthcare.

Approximately two thirds of the follow-up group had accessed two or more other health services in the week after their LWBS episode, with only one in eight choosing to return to the emergency department within 7 days. Only 23 of the 457 follow-up patients (5.0%) were admitted following an emergency department visit within 7 days—although the study did not examine whether this was for the same episode of illness or injury. This suggests that although these patients would have preferred their problem to be solved immediately, alternatives did exist for subsequent care. A follow-up study could provide better information on whether this group had worse outcomes because of the LWBS episode.

As expected, this study found that patients are less likely to wait for medical assessment if there are prolonged waiting times, which correlates with times the emergency department is overwhelmed. Patients have less tolerance for waiting if they have been triaged as lower acuity, if they are waiting during the night shift and if they are parents of young children. A proportion of patients may receive sufficient reassurance by the triage assessment so that they no longer feel such urgency for immediate medical review. Most patients who LWBS subsequently accessed medical care, and <5% were admitted over the following week. Further research could focus on ways of minimising delays for medical review, and in better understanding the service provided by the triage assessment.

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