

Emergency Department Visits by Homeless Patients in Canadian Emergency Departments

FINAL Report

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Contributions

The project was conceived by BHR, RC, GC and DV. All named co-authors participated sufficiently in the project to claim authorship based on international standards for authorship. SK coordinated the study; RC, AD, TN, BV, BH, and EC collected the data. Data management was provided by SC, CVR, KC. Funding was secured by DV, GC, and BHR. All authors contributed to editing the manuscript and are able to take responsibility for the finished product.

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Executive Summary

Objective

Some low acuity Emergency Department (ED) presentations are considered convenience visits and potentially avoidable with improved access to primary care services; this applies especially to certain marginalized groups (e.g., homeless, post traumatic head injuries, Aboriginal groups, etc). A 2013 study explored reasons for ED presentation in Edmonton, Alberta; this is a sub-analysis focused on characterizing the homeless population involved in this study.

Methods

Prospectively, patients > 17 years of age were randomly selected from electronic registration records at three urban ED sites in Edmonton, AB. Following initial triage, stabilization, and verbal informed consent, patients were asked to complete a questionnaire. The questionnaire collected information on demographics, reasons for presentation, primary care access and abortive actions taken prior to presentation. Homelessness was self-identified and verified from address information at presentation. Descriptive analyses and unadjusted comparisons were performed; proportions as well as crude odds ratios (ORs) and 95% confidence intervals (CI) are reported.

Results

Of 2144 patients approached, 1408 (66%) completed the survey; only 42 (3%) patients were identified as homeless. More males were homeless than females (59% vs. 45%) and the mean age was similar between homeless/non-homeless (42 vs. 45 years); however, aboriginal patients were over-represented (44% vs. 8%) whereas Asians were under-represented (0% vs. 6%) in the homeless group. Homeless patients were less likely to have a Family Physician (FP) than non-homeless patients (crude OR = 0.5; 95% CI: 0.3, 0.9). Homeless patients were more likely to report history of minor (crude OR = 3.2; 95% CI: 1.7, 6.0) and severe (crude OR = 3.5; 95% CI: 1.8, 7.2) head injuries than non-homeless patients.

Conclusion

This study found a small number of homeless patients presenting to the ED. Patients with unstable housing/homelessness appear to be more likely to have a history of head injury, and to be disconnected from the primary care providers. Additional research and analyses will help us understanding the association between homelessness and poor linkage with a FP, and homelessness and ED presentations for head injury.

Introduction

Overcrowding of hospital emergency departments (ED) is a significant problem in the Canadian healthcare system.^{1,2} It is represented conceptually as a multi-factorial consequence of input, throughput and output factors.³ By imposing a demand for services that exceeds the ability to provide care within a reasonable time, overcrowding creates many problems for ED staff such as inability to provide quality patient care; delays in timely treatments (e.g., antibiotic administration and pain relief); and frustration for patients and staff. Many marginalized patients, particularly the homeless,⁴ frequently attend the ED, though it is unclear why many presentations correspond to non-life threatening illness or injuries. Many researchers and policy-makers believe that a better understanding of why patients attend the ED with less severe disease presentations is an important step to finding permanent solutions to ED overcrowding.

To date, efforts to understand reasons for presentations have taken a broad approach and have failed to provide specific suggestions that can be implemented in individual EDs or by a healthcare system. In 2004, a survey was administered to 894 patients over 17 years of age presenting to the Royal Alexandra (RAH) and University (UAH) Hospitals in Edmonton, and found important results.⁵ For example, the proportion of patients with clear links to a primary care provider (PCP) was lower than reported nationally. In addition, 61% of these patients attempted alternatives of care prior to their ED presentation. Finally, results of the adjusted analyses showed that injury presentation, living alone, current smoker and not having a FP were predictors for *not* seeking alternative care before visiting the ED.

Since that time, many aspects of health delivery in the Edmonton Zone of Alberta Health Services (AHS) have changed. For example, the zone medical help line has become provincial, health authorities have been replaced by a Provincial Board and delivery system (AHS), strategies to reduce delays have been implemented, and wait times are now conveniently available on the AHS website. With such changes, it is important to gain updated information on who presents; how they arrive; their complaint(s); and when, how often, and how severe the presentations are. With the exception of socio-demographic factors, presenting complaints, and discharge diagnoses, there is currently very little known about presentations to ED's.

A 2013 study examined the reasons for presentation to the ED in Edmonton, Alberta (e.g., prior primary care contact, access to alternative care, etc.) amongst patients with non-life threatening illnesses and injuries; this is a sub-analysis focused on characterizing the homeless population involved in the original study.

Methods

Study Design and Setting

A cross-sectional survey of patients presenting to three urban ED's was undertaken over a 10-week period from May 2013 to July 2013 at the Royal Alexandra Hospital (RAH), Northeast Community Health Centre (NECHC), and the University of Alberta Hospital (UAH) in Edmonton, Alberta, Canada. Both the UAH and RAH are major referral centres for trauma. All three hospitals represent a diverse population of patients, including the inner city (RAH) and ethnically diverse (NECHC) populations. They are also staffed by full-time emergency physicians and have various levels of trainees from the University of Alberta. See **Table 1** for a summary of the characteristics of the three hospitals.

Study Participants

Inclusion criteria: Patients aged 17 years and older, with a Canadian Triage and Acuity Scale (CTAS) score III-V were eligible for inclusion in the study.⁶ CTAS is a tool that helps assessing the type and severity of the patient's medical condition and allows the ED staff to prioritize patients based on their needs.⁷ Patients with a CTAS score of III-V are considered to have presenting medical complaints of moderate to mild acuity.

Exclusion criteria: Cognitive impairment, previous enrollment, direct consultations, patients presenting to the ED for imaging tests or a pre-set appointment for intravenous therapy (IVT), or under police escort were excluded from the study. Patients who were unable to read or communicate in English were also excluded, unless a friend or family member was able to complete the survey on their behalf. Patients who were feeling too unwell, due to nausea, pain, emotional instability, or intoxication, but improved before the end of the study shift were approached to participate in the study.

Selection: A non-stratified, balanced and cluster-based random sampling method (using a computer random number generator) was used to select the study shifts. One of three possible study shifts was randomly chosen each week (for a total of 4-5 weeks) based on the following ED registration periods: 0700 - 1300, 0900 - 1500, or 1300 - 1900. For each hour during the study shift, patients were assigned a number based on the consecutive time of presentation. A series of random numbers from 1-30 was randomly generated which identified the order in which patients were approached for the study.

Consent: Patients were approached by trained research assistants (RAs) who informed them about the study either in the waiting room or in a private care space. Those patients who provided verbal consent were provided with the questionnaire and completed it either themselves or with the assistance of their friends, family or the RAs. If the ability of the patient to provide informed consent was uncertain (e.g., cases of apparent intoxication or cognitive impairment), the RAs verified with the attending physician or nurse the patient's ability to consent.

A **Refused, Missed, and Other** exclusion (RMO) minimal data log was maintained (e.g., age, sex, time of day, triage score, reason for exclusion).

Data Collection Methods

Informing the public/staff: A sign was approved and posted informing patients of the conduct of the survey in each ED. Staff were made aware at all times during the study. Patients were further provided with a 1-page information sheet.

Responsibility for care: The emergency physician attended all patients to complete a formal medical history and physical examination. On most occasions, the RAs interviewed the patient prior to an emergency physician seeing the patient. During the interview, if a physician or nurse needed to assess the patient, the interview was completed after their assessment. The survey did not delay direct patient care.

Survey Instrument: A 47-item questionnaire was developed based on a previously validated survey,⁵ with some additional questions added to capture additional information on risky health practices. The questionnaire was available in both paper and computerized tablet form, and completed either through self-administration or interview (the consenting patient was offered a choice of options). The questionnaire on the tablet was completed via Research Electronic Data Capture (REDCap).⁸

The questionnaire took approximately 15-20 minutes to complete. Information was collected on reasons for patient presentation, whether the patient had a PCP, use of the HealthLink phone line or wait times website, previous interaction with the healthcare system, and perceptions of reasonable wait times. Patients were also asked about their health practices including vaccinations, drug or alcohol use, smoking history, their use of seat belts and bicycle helmets, and whether they had any history of loss of consciousness. Patient demographics including age, sex, ethnicity, living situation, employment, and sexual preferences were also assessed. Minimal patient information such as age, triage score and time of arrival were retrieved from the Emergency Department Information System (EDIS).

Exposure and Outcome Measures

Homelessness was self-identified from options relating to two questions in the questionnaire: What is your current living arrangement, and what is your current place of residence? Responses were designated for homelessness if participants marked their response as either couch surfing/no fixed address or homeless/shelter for their living arrangement, or if they responded as living in a shelter for their current place of residence. Homelessness was also verified from address information at presentation. Patients were identified as homeless if they listed no-fixed address, or provided an address for any of the local homeless shelters

The primary outcome was the percentage of homeless and non-homeless patients with a documented linkage with a PCP. A secondary outcome was the percentage of homeless and non-homeless patients with minor and severe head injuries.

Sample Size

The method of sample size calculation was discussed previously.⁵ Briefly, based on estimates from previous research at the UAH and RAH, the proportion of ED patients reporting no family physician (FP) in 2004 was 21%.⁵ In order to obtain a precision of approximately 3% surrounding the point estimate a sample size of approximately 500 from each site was required for an expected total recruitment of approximately 1500 patients.

Statistical Analysis

Study data (obtained electronically or through paper-based forms) were managed using REDCap⁸ and analyzed using the Statistical Package for the Social Sciences (SPSS Inc., version 13.0, Chicago, Ill.). Dichotomous variables were reported as percentages; continuous variables were reported as means and standard deviations (SDs) or medians and interquartile ranges (IQRs), in the presence of skewed data. Logistic regression analyses are currently in progress.

Ethics

The study protocol, which included questionnaire administration and implied consent upon completion of the study was reviewed and approved by the Health Research Ethics Board at the University of Alberta. Operational approval was obtained from the ED management and the study gained Administrative approval from AHS.

Informed consent was implied by completion of the survey; no written consent was obtained. Patient names and identifying characteristics were not recorded on the questionnaire; however, a master form was retained in a separate location until data capture was complete. All records were retained in a secure area and only aggregate data were reported.

Results

Figure 1 summarizes the study recruitment and reasons for exclusion. Overall, 4269 eligible patients were selected from the ED computerized records to consideration in the study. A total of 2125 patients were excluded from the study. Patients were excluded for a variety of reasons including younger than 17 years (877 (21%)), presenting with a CTAS score of I-II (639 (15%)), cognitive/psychiatric impairment (n=155 (4%)), presenting to the ED for imaging tests (137 (3%)), planned visit for IVT (61 (1%)) or direct consultation (127 (3%)). Additional exclusions included, language barrier (n=58 (1%)), patients arriving from prison or with police escort (n=16 (<1%)), or patients feeling to unwell to participate (55 (1%)).

Of the remaining 2144 eligible patients with CTAS score of III-V, 503 (23%) patients refused, 196 (9%) were missed (i.e., had left without being seen by a physician or had already been treated and discharged, or unable to locate patient in ED) and 37 (2%) patients were excluded due to previous enrollment. Overall, 1408 (66% of total approached) patients consented to the study and were included in the analyses.

Survey mechanisms: Of the participants, 72 patients completed the questionnaire on the tablet, with 33 completing the survey themselves, 35 needed assistance from an RA, and 2 required help from their family/friends. The remaining 1336 patients completed the survey on paper, with 897 completing the survey themselves, 314 received assistance from RA's and 125 patients required assistance from family or friends.

Participant characteristics: Overall, 42 (3%) patients were classified as homeless (**Table 2**). Females were more common in the non-homeless group than the homeless group (55.2% vs. 41.5%). The mean age for homelessness (41.9 ± 12.5 years) was younger compared to non-homeless (45.3 ± 20 years) patients. The majority of patients were not married in both the homeless and the non-homeless group (87.8% vs. 53.5%). Overall, the aboriginal population was over represented in the homeless group (43.6% vs. 7.7%) whereas Asians were under-represented in the homeless group (0% vs. 6%). The majority of homeless population had not completed high school (74.4% vs. 45.7%) and were more commonly unemployed (66.7% vs. 43.9%) compared to the non-homeless population.

Diversity and sexual orientation was identified with non-heterosexual life choices representing 8.6% of the homeless population compared to 4.8% of the non-homeless population. A lower proportion of homeless patients were non-smokers (18.5% vs. 70.1%; crude OR = 0.1; 95% CI: 0.04, 0.23) and a higher percentage of the homeless consumed alcohol (73.8% vs. 56.1%; crude OR: 2.2; 95% CI: 1.1, 4.4) when compared to the non-homeless population. Finally, homeless patients reported using their seatbelts similarly (83.3% vs. 90.4%; crude OR: 0.5; 95% CI: 0.2, 1.6) and wearing bicycle helmets less frequently (24% vs. 53%; crude OR: 0.1; 95% CI: 0.1, 0.5) when compared to the non-homeless population.

Link to Primary Care Provider: **Table 3** outlines the access to primary care, use of/alternatives to emergency departments and injury presentations for homeless and non-homeless respondents. A smaller proportion of homeless patients were linked to a FP when compared to the non-homeless population (59.5% vs. 74.9%; crude OR = 0.5; 95% CI: 0.3, 0.9). The diversity of reasons for not having a FP was similar between the two groups, however; the homeless sample had a lower proportion of established PCP who recently ceased practicing (0% vs. 21.8%).

Head Injury: More patients who were homeless had a documented injury presentation (75% vs. 49.6%). More homeless patients had a head injury with a loss of consciousness less than 30 minutes (60.0% vs. 32.5%; crude OR = 3.2; 95% CI: 1.7, 6.0) compared to the non-homeless population. The patients in the homeless group were also more likely to report a previous head injury that resulted in a loss of consciousness greater than 30 minutes (26.3% vs. 9.6%; crude OR = 3.5; 95% CI: 1.8, 7.2).

Previous ED Visits: Homeless patients had visited the ED for the same condition in the past more often than non-homeless sample (53.9% vs. 40%; crude OR = 1.1; 95% CI: 0.6, 2.0). The proportion of patients reporting five or more presentations was similar between the homeless and the non-homeless (35.4% vs. 24.3%) groups. Homeless patients less frequently believed the ED was the best option for their care needs (82.9% vs. 92.2%; crude OR = 0.4; 95% CI: 0.2, 1.0).

Alternative Care Strategies prior to the ED visit: Homeless and non-homeless patients made the same attempts to seek alternative treatments before coming to the ED (44.7% vs. 53.2%). Overall, homeless patients were less aware of the provincial health help line (37.5% vs. 65.1%; crude OR = 0.3; 95% CI: 0.2, 0.6) and the ED wait times website (2.4% vs. 23.1%; crude OR = 0.1; 95% CI: 0.0, 0.6).

Discussion

This is a sub-analysis of a large survey that examined patients presenting to three high-volume urban EDs with non-life threatening problems in the summer of 2013 to determine demographic, health services and efforts made to avoid ED visits between homeless and non-homeless patients. It is well known that head injury is more common in patients with unstable housing,⁹ which is likely a contributing factor for their inability to maintain stable housing, employment or conform to the social requirements for either.¹⁰ In this particular sub-analysis, the homeless population differed in many ways from the non-homeless population; however, there were significant differences in the proportion of patients who had suffered a minor or severe head injury. The patients who were homeless exhibited less connections to a regular FP and more visits to the ED for similar reasons. The homeless population also demonstrated higher smoking and alcohol consumption figures and although other healthy life choices were not examined, it is likely that other interventions provided by FPs were less accessible to this homeless population. Studies examining the reasons for ED visits are rare, especially in Canada.^{5,11} A survey administered to 894 adult patients presenting to two hospitals in Edmonton in 2004, found clear links to a PCP was lower than national levels and 61% of patients attempted alternatives to the ED prior to their presentation.⁵ Results of the regression analysis showed that injury presentation, living arrangements, smoking status and whether or not patients had a family practitioner were predictors for seeking alternative care before visiting the ED. A more recent study of 682 patients presenting to six Vancouver EDs revealed distance to a specific ED and perceived ED wait times were the most important reasons for choosing that ED.¹¹ Few studies in the emergency setting have addressed similar issues as the current study.⁵ Homelessness varies considerably by provincial location, socio-economic status, climate and social support. Given the difficulty with case-finding, the designation of homelessness required both an in-person interview and review of information from the medical record. For example, some patients with no fixed address on their medical record stated in their survey that they were living with friends. In this case we assumed the patient was “couch surfing” and had unstable housing. In addition, patients would place an address on their form however would describe themselves as homeless. Finally, patients in homeless shelters had a variable response on their survey to their housing status. In all cases we used a combined approach to

identify homelessness and feel that we still may have missed some patients who were reluctant to admit to their homeless status to the RA.

Although only 59.5% of homeless patients reported having a FP, they were just as likely to attempt alternative treatment before the ED visit when compared to the non-homeless population. While this suggests that many primary care physicians are unavailable to their patients when they are needed, we would support implementing strategies to increase timely accessibility to primary care services, such as FP group practices offering drop-in, unscheduled services.¹²

Limitations

There were several limitations in the study. First, the sampling excluded patients with CTAS I-II or who were deemed too unwell by ED staff, meaning patients with severe illness were under-represented in this study. We do not feel this introduced selection bias, since CTAS I-II patients were not part of our target population; clearly these patients need the ED services and any delays they make would not be relevant to ambulatory care use of the ED. The objective of the ED survey was not to enroll patients in immediate need of emergency care, but rather patients with non-life threatening illnesses and injuries that had the option of presenting to multiple primary care resources other than the ED. Our results included a slightly higher proportion of high acuity (CTAS III) compared to low acuity (CTAS IV or V) enrolled in the study, suggesting our patient population represents a fair balance of high and low acuity. Second, while we randomly selected patients for interview, due to logistic and funding reasons, we did not survey patients over night. The low volume of patients at night would preclude assigning staff to that time period but we likely missed any patient groups who may be more likely to present to the ED overnight. Third, we sampled only during a 2-month period in the summer when RA's were more available. If additional patient recruitment took place during the fall and winter, it is likely we would have been able to enroll a broader sample of homeless patients presenting to the ED. Fourth, the study was conducted at only three urban EDs only. The study added 1 ED more than the previous study in the same city; however, it is unclear if these results are generalizable to other ED sites or communities. Similar research using different hospitals in different areas (rural vs. urban) may provide additional granularity to these conclusions. Finally, there were a large number of people who refused. We found that in some cases during sampling period, several patients would refuse participation and this started a domino effect where multiple patients would refuse over a short period of time. This was particularly problematic at the RAH and in times where waiting rooms were overcrowded.

The 2013 National Physician Survey reported that FPs are experiencing increasing demands for their services, see virtually no change in the supply of FPs in Canada, and 38% expect to retire/reduce their practice.¹¹ Consequently, it is unlikely that primary care will satisfy the needs of many of the patients seen in the ED in the immediate future. The health region in which this study was conducted has an even lower percentage of FPs accepting new patients without any restrictions (21%) and a shortage of PCPs is widely acknowledged as a long-standing problem.⁵ This issue likely contributed to the barriers to accessing a PCP, and reflects national concerns that access to PCPs is a significant issue that needs to be addressed.

Finally, care delays in overcrowded EDs are a significant problem in North America.² Lengthy delays prior to being seen and protracted lengths of stay were commonplace in this study. Since one of the most significant factors influencing ED service satisfaction is the amount of time spent waiting to see a doctor

after the nurse's initial assessment,¹¹ the responses from patients may have been negatively biased by the overcrowded emergency environment in which they were waiting prior to the survey.

Strengths

Notwithstanding these limitations, this is a sub-analysis of one of the largest surveys of ED patients with respect to their link with a PCP/FP and prior actions designed to prevent an ED visit. The results are comparable to a previous study completed in the Edmonton zone in 2004.⁵ The high completion rate following consent and the comprehensiveness of the data collection contribute to the validity of these results. Specifically, the inclusion of a measure of urgency (triage) which incorporated patient expectations and preferences was unique.⁷ Finally, we have identified very large differences between the homeless and non-homeless populations presenting to the ED. This sample is representative of three hospitals of varying severity of patient presentations including an academic teaching hospital, an inner city tertiary care hospital and a community ED; however, the inner city site appeared to be the location of the highest proportion of homeless presentations. Finally, a comprehensive survey was used to identify important factors associated with homelessness and this information should be of general value to the homeless population as well as those organization that provide services to patients with head injury.

Conclusions

This study revealed that patients using EDs most commonly are not homeless; however, like many other ED patients, homeless patients seem to be making considerable efforts to avoid the ED by seeking care elsewhere. Patients with unstable housing/homeless frequently have a history of head injury, have life style choices that contribute to their poor health and are disconnected from the primary care providers who are needed to resolve some of the complex health issues these patients face. The ED is perceived as the most appropriate place for care for most patients and remains an important safety net within the Canadian health care system, especially for marginalized groups such as the one explored in this sub-analysis. Finally, adjusted analyses will help us understanding the crude association observed between homelessness and poor linkage with a FP, as well as homelessness and ED presentations for head injury.

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