Does facility type and location impact upon patient experiences in emergency departments? Secondary analysis of a state-wide, cross-sectional survey

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Abstract

Objective: To identify the extent to which patient experiences in the Emergency Department (ED) differ depending on facility type (based on bed numbers, services available and annual separations), and location (level of remoteness).

Methods: Data from a 2015 state-wide (Queensland, Australia) public ED patient experience survey were linked to sociodemographic and presentation-related characteristics data. Survey items were individually scored (from 0-100), and averaged across 13 pre-determined patient experience topic areas. Descriptive statistics were used to report on patient sociodemographic and presentation-related characteristics. One-way analysis of variance tests were used to identify associations between patient-reported experience scores, facility types and location.

Results: A total of 10,553 patients over the age of 16-years completed the survey. All patients reported scores above 75 for 7 of the 13 patient experience topic areas (0 = lowest score, 100 = highest score). Patients from very remote and outer regional EDs reported the highest scores for the topic *Environment and facilities*, and remote facility patients reported the highest score for the topic *Leaving the ED – Delays*. The same two topic areas were scored most highly by patients from smaller facilities in comparison to principal referral hospital EDs.

Conclusions: Patients attending smaller and more rurally located EDs reported more positive experiences than those attending larger, metropolitan EDs on two of the 13 topic areas. However, these differences were marginal. Future research should aim to determine what constitutes clinically meaningful differences between groups when comparing patient-reported experience scores, and understand the characteristics of small and rural EDs that may be associated with better patient experiences.

Keywords: Surveys and Questionnaires; Patients; Emergency Service, Hospital; Delivery of Health Care; Quality of Health Care

Introduction

Hospital Emergency Departments (EDs) provide acute care services to patients of all ages and condition types, and play a pivotal role in linking community and hospital healthcare services. They are arguably the most unpredictable and chaotic care environment in modern-day healthcare systems. Internationally, the number of presentations made to EDs each year is growing^{1,2}. In Australia specifically, the increase in ED presentations during 2017-18 (3.4%) was more than double the annual rate of population growth (1.6%)^{3,4}. This growth in demand contributes to issues such as overcrowding and long wait times⁵, and challenges EDs striving to provide safe, high quality healthcare.

Optimising patient experiences in healthcare is recognised as integral to the provision of high quality healthcare⁶⁻⁸ and the enactment of value-based healthcare⁹. Given the complexity of the care environment, and the distressed state in which many patients present, it is unsurprising that optimising patient experiences in the ED is a priority for many health service managers and organisational leaders globally¹⁰⁻¹². To date, strong determinants of patient experiences in the ED include waiting times, the patient-provider relationship and the physical environment^{10,13}. Yet, a paucity of research exists regarding the effects of facility type and location on patient experiences in the ED, despite evidence in the inpatient setting suggesting that facility characteristics such as bed numbers, teaching status and geographical location can influence patient-reported experiences¹⁴⁻¹⁸.

This study aimed to identify the extent to which patient experiences in the ED differ depending on facility type (based on the number of beds, services available and number of separations annually), and location (level of remoteness). This information may inform discussions related to how equivalent care experiences can be delivered within a universal

healthcare system, irrespective of differences in the geographical location and size of facilities delivering care.

Methods

This study reports a secondary analysis of the 2015 Emergency Department Patient Experience Survey (EDPES) data collected during the 1st of August – 30th of September, 2015 from 51 public hospital EDs across Queensland (QLD), Australia. EDPES data were linked independently by statisticians at the Queensland Government Statistician's Office (QGSO), to respondent Emergency Department Information System (EDIS) records; the information system in use across QLD EDs at the time of the survey. This linked respondent EDPES scores with their individual sociodemographic and presentation-related data.

Administrative and sociodemographic data for individual patients over the age of 16 concurrently presenting to the same 51 EDs during the same time period were also collected. Data were unidentifiable and obtained through EDIS records.

Emergency Department Patient Experience Survey (EDPES) sample

A total of 10,553 individuals over the age of 16 were surveyed during the two-month period using computer-assisted technology interviewing (CATI)¹⁹. Participants were randomly selected from their facility's EDIS records. A target sample size was calculated for each facility; where facilities were predicted not to meet the target sample size (or were very close to it), census sampling was undertaken¹⁹. Participant eligibility criteria is documented in Appendix 1.

Survey instrument

The 2015 EDPES is a 63-item patient-reported experience measure (PREM). It was developed from two previous versions of the same survey, which were in-turn developed

from the UK's 2009 Care Quality Commission (CQC) Accident and Emergency (A&E) Department Question Bank²⁰. Items in the 2015 EDPES are grouped into 14 topic areas that reflect the sequence of events comprising a patient's experience in the ED (see Figure 1).

[Insert Figure 1 here]

Data analysis

Descriptive statistics were used to report on the sociodemographic and presentation-related characteristics of the EDPES sample and concurrently presenting QLD ED population. Univariate logistic regression analysis was used to compare the representativeness of the EDPES sample to the concurrent population. EDPES items were individually scored on a linear scale ranging from 0-100 following the process proposed in the QLD Health *Emergency Department Patient Experience Survey 2015* report¹⁹ (see Appendix 2). An overall topic area (TA) score was generated for each respondent based on an average of respondents' scores to all items comprising the pre-determined topic areas. Average EDPES topic area results were tabulated for the different facility types (6 categories), and facility locations (level of remoteness) (5 categories). EDs were coded into 'facility types' and 'location (level of remoteness)', according to the Australian Institute of Health and Welfare (AIHW) *Australian hospital peer groups 2015* report²¹ and the Australia Government Department of Health *Australian Standard Geographical Classification – Remoteness Area (ASGC-RA)*²², respectively. Table 1 outlines facility types based on services provided, bed numbers and number of hospital separations²¹.

[Insert Table 1 here]

The topic area *Leaving the ED – Destination* was comprised of a single item which was not scored¹⁹, leaving a total of 13 topic areas to be included in the analysis (topic area 14 is still referred to as 14). One-way analysis of variance (ANOVA) tests were used to identify

whether mean topic area scores were significantly different between patients treated at different facility types and different locations (levels of remoteness). Due to the large sample size, statistical significance was set at $\alpha \leq 0.01$. The current study received ethical approval from the Gold Coast Hospital and Health Service and Griffith University Human Research Ethics Committees (LNR/2018/QGC/44522 and 2018/831, respectively). All data were analysed using StataSE13 (College Station, TX: StataCorp LP).

Results

A total of 10,553 patients over the age of 16 responded to the EDPES during the months of August and September, 2015. In comparison to the concurrently presenting QLD ED population (n=219,503), the samples differed significantly ($p < 0.001$) in terms of age, mode of arrival to the ED, Australasian Triage Score (ATS) and episode end status (see Table 2). There were also significant differences ($p < 0.001$) between the numbers of patients presenting to EDs within the different facility types and remoteness levels.

[Insert Table 2 here]

Table 3 presents the average EDPES topic area scores for participants across the different facility types and locations (level of remoteness). Overall, participants reported the highest average scores for *Environment and Facilities* (TA8) (92.7 ± 13.7), indicating that patients viewed the ED environment and toilets as clean, they were able to access suitable food and drinks, and were not bothered or threatened by other patients or visitors (see Appendix 3 for items comprising TA8). This was followed closely by *Care and Treatment* (TA5) (90.2 ± 15.2), which was comprised of items related to whether patients felt respected, treated kindly, were involved in their care to the extent they wanted to be, and were given enough privacy (see Appendix 3 for items comprising TA5).

Complaints (TA14) was scored lowest, on average, by all participants (28.2 ± 45.0). This topic area was based on one item (*While you were in the ED, were you told or did you see a poster or brochure on how to [give feedback about the care your received]?*), indicating that patients were unaware of how to provide feedback to ED services regarding the care they received. The second lowest scoring topic area was *Leaving the ED – coordination of follow-up services* (TA12) (62.2 ± 44.2), suggesting that patients did not feel as though adequate arrangements were made by the facility for follow-up services they may need. On average, participants reported scores of 75 or greater for 7 of the 13 topic areas.

With regards to the location (level of remoteness), little variation in the average topic area scores was evident, with no significant differences identified for 11 of the 13 topic areas (see Table 3). The two topic areas where a statistically significant difference was identified were: *Environment and facilities* (TA8) ($p < 0.01$), with very remote and outer regional facilities having the highest scores (95.9 ± 9.7 and 93.6 ± 13.0 , respectively); and *Leaving the ED – Delays* (TA9) ($p < 0.01$) with remote facilities having the highest scores (81.3 ± 39.1), indicating that patients at these facilities experienced fewer discharge-related delays.

When EDs were considered in terms of facility type, little variation in average topic area scores existed for 11 of the 13 topic areas (see Table 3). The two topic areas where a statistically significant difference was identified were: *Environment and facilities* (TA8) ($p < 0.01$), with Group C and D acute facilities having the highest average scores (93.9 ± 21.6 and 94.2 ± 11.6 , respectively); and *Leaving the ED – Delays* (TA9) ($p < 0.01$), with Group B and C acute facilities having the highest average scores (72.1 ± 44.9 and 72.3 ± 44.8 , respectively).

[Insert table 3 here]

Discussion

The aim of this study was to identify the extent to which ED patient-reported experiences scores differed depending on the location (level of remoteness) and types of facility providing emergency care. With the growing emphasis on consumer engagement in health services research and service co-design, patients are in a unique position to provide constructive information regarding the experiences of care they receive²³. Consequently, the results of the current study may have implications for researchers and service decision-makers by guiding future research directions and service delivery models that aim to optimise patient experiences in the ED.

The results from this study indicate that smaller and more rurally located facilities performed better on many of the EDPES topic areas than larger, more metropolitan facilities. However, these differences were marginal, and statistical significance was detected for only two EDPES topics areas: *Environment and facilities* (TA8) and *Leaving the ED – delays* (TA9). Consequently, while we can suggest that smaller and more rurally located facilities provided better ED patient experiences, we are unable to determine the extent to which the differences identified between facility types and locations represent clinically meaningful differences i.e. whether these differences are real or noticed by patients in practice. This is an avenue for further research regarding the interpretation and usefulness of patient-reported experience data.

One group of Australian researchers have previously indicated that people living in rural areas are subjected to poorer experiences as a consequence of fewer resources, less experienced clinicians, lower equipment levels, reduced staff training, and poor care coordination in rural facilities²⁴. However, this is discordant with the results of the present study, and 2017-18 *Emergency Department Patient Survey* data from the Bureau for Health Information (BHI) (New South Wales, Australia)²⁵. The BHI data depicts a similar trend to the current study in that patients receiving care in smaller and more rurally located facilities

were more likely to report “very good” overall patient experiences than patients receiving care in larger metropolitan facilities²⁵. There may be a multitude of reasons that patients receiving care in smaller and more rural facilities report better experiences, such as having lower expectations for their care experience, exhibiting a lower socioeconomic status (e.g. of lower education and elderly)²⁶, or less queuing and crowding in rural and remote EDs, which has previously shown to have a significant impact upon patient experience scores in the USA²⁷. Future research should aim to distinguish between patient characteristics and facility characteristics of smaller and more rural EDs that are associated with better patient experiences. Practices and service models employed by smaller and more rural EDs may inform larger institutions, and promote the delivery of equivalent ED care experiences regardless of where a patient seeks care or their sociodemographic characteristics.

One of the poorest performing EDPES topic areas was *Leaving the ED – coordination of follow-up services* (TA12) (average score: 62.2±44.2). The item underpinning this topic area was: *Were adequate arrangements made by the hospital for any services you needed?* This result suggests that patients experienced inadequate referral to, or planning for, follow-up care upon leaving the ED. The link between ED presentations and discharge planning for subsequent follow-up by a healthcare provider in the community suggests that this mechanism is crucial to reducing return ED visits²⁸. Previous Australian research has demonstrated the positive impacts of appropriate ED discharge planning, by reducing unnecessary patient re-presentation to the ED²⁹. This, in-turn, has downstream clinical and financial impacts for both patients and hospitals. Consequently, future research and quality improvement initiatives should consider how to optimise ED coordination of follow-up services for patients being discharged into the community, and raise awareness as to its importance for patients’ and hospitals’ clinical and financial outcomes.

Limitations

Several limitations pertain to this study. First, patients diagnosed with a mental health problem were excluded from the sampling strategy employed in 2015, despite over 5% of ED presentations during 2015-16 being coded as a mental and behavioural disorder principal diagnosis (ICD-10, Chapter V)³⁰. The exclusion of these individuals may impact upon the generalisability of the results to this patient group. Second, participant recall bias may be possible as data collection was undertaken during the months of October – December, 2015, yet patient ED experiences occurred during the months of August – September, 2015.

There were also limitations with the survey itself. The validity and reliability of the EDPES is unknown. Further, several topic areas were comprised of an individual item whereas others contained up to 11 items. This meant that the average topic area scores were informed by varying amounts of information, and notably, the two lowest scoring topic areas were comprised of a single item. Moreover, due to the structure and logic of the survey as well as the scoring methodology, topic area scores were informed by a varying number of participants. For example, *Leaving the ED – coordination of follow-up services* (TA12) was not asked to 31.4% of survey participants and 68.9% of survey participants were excluded from the scoring as they ‘did not need any services’ (see Appendix 2). Additionally, our ability to undertake further analysis, to determine the dimensionality of the EDPES (using exploratory factor analysis), was prevented due to limitations associated with underlying survey logic.

A final limitation is that there were several sociodemographic and presentation-related differences between the sample and the population of patients who visited Queensland EDs during the same time period. Thus, while the sample was large at over 10,000 respondents, the responses may not reflect that of the population of patients visiting the ED during this period.

Conclusion

This study aimed to identify the extent to which patient-reported experiences in QLD EDs differed depending on the location (level of remoteness) and types of facility providing care. The results of this study suggest that patients receiving ED care in smaller and more rurally located facilities reported significantly better experiences with respect to two of 13 topic areas than patients receiving care in larger, more metropolitan facilities. However, the magnitude of these differences were small. Future research should aim to determine what constitutes a clinically meaningful difference when comparing patient-reported experience data between groups. Further, to promote the delivery of equivalent ED care experiences irrespective of ED location or facility type, future research should aim to understand the characteristics of smaller and rurally located EDs that may facilitate better patient experiences.

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Table 1: Hospital peer groupings (derived from: Australian Institute of Health and Welfare
*Australian hospital peer groups 2015 report*²¹⁾)

Hospital peer group	Hospital sub-group	Specific services available	Beds	Separations
Acute public hospital	Principal referral hospitals	<ul style="list-style-type: none"> • 24-hour emergency department • ICU • All or most of the following specialised units: cardiac surgery, neurosurgery, infectious diseases, bone marrow transplant, organ (liver, kidney, heart, lung or pancreas) transplant, and burns units 	Average: 651 Range: 358 – 1,023	Average: 67,649 Range: 39,102 – 98,831
Acute public hospital	Public acute group A hospitals	<ul style="list-style-type: none"> • 24-hour emergency department • ICU • Coronary care unit • Oncology unit 	Average: 254 Range: 79 – 503	Average: 29,355 Range: 7,736 – 60,758
Acute public hospital	Public acute group B hospitals	<ul style="list-style-type: none"> • 24-hour emergency department • Elective surgeries • Some combination of an obstetrics unit, paediatric unit and/or psychiatric unit 	Average: 123 Range: 66 – 373	Average: 15,370 Range: 4,977 – 40,730
Acute public hospital	Public acute group C hospitals	<ul style="list-style-type: none"> • Emergency department or accident and emergency services • Obstetric unit 	Average: 42 Range: 10 – 181	Average: 3,453 Range: 468 – 23,999
Acute public hospital	Public acute group D hospitals	nil	Average: 17 Range: 0 – 75	Average: 603 Range: 200 – 2,787
Very small hospital	Very small hospital	nil (characterised by remoteness)	Average: 8 Range: 0 – 34	Average: 95 Range: 0 – 197
Specialist hospital	Children's hospitals	<ul style="list-style-type: none"> • ICU • Organ transplant unit • Neurosurgery unit • Comparable to <i>Principal referral hospitals</i> 	Average: 216 Range: 142 – 290	Average: 24,603 Range: 17,571 – 34,589
Specialist hospital	Women's hospitals	<ul style="list-style-type: none"> • ICU (including neonatal) • Organ transplant unit • Neurosurgery unit 	Average: 168 Range: 122 – 252	Average: 15,369 Range: 9,787 – 25,502
Specialist hospital	Women's and children's hospitals	As above	As above	As above

ICU = intensive care unit.

Table 2: Description of sociodemographic and presentation-related characteristics for the EDPES sample (n=10,553) and concurrent QLD-wide population (n=219,503) over the age of 16 years old

Sociodemographic characteristics	EDPES sample n (%)	Concurrent QLD- wide population n (%)	p-value [†]
Total presentations	10,553	219,503	
Age (in groups)[‡]			
16-35	3,077 (29.2%)	83,208 (37.9%)	p<0.001
36-55	3,059 (29.0%)	61,190 (27.9%)	
56+	4,417 (41.8%)	75,104 (34.2%)	
Sex			
Male	5,173 (49.0%)	108,809 (49.6%)	p=0.29
Female	5,380 (51.0%)	110,678 (50.4%)	
Indigenous status			
Neither Aboriginal or TSI	9,806 (92.9%)	199,996 (91.1%)	p=0.07
Aboriginal and/or TSI	539 (5.1%)	17,259 (7.9%)	
Unknown	208 (2.0%)	2,248 (1.0%)	
ED presentation-related characteristics	EDPES sample n (%)	Concurrent QLD population n (%)	p-value
Mode of arrival			
Ambulance	2,734 (25.9%)	75,146 (34.2%)	p<0.001
Other	7,819 (74.1%)	144,357 (65.8%)	
ATS			
1 (resuscitation)	38 (0.4%)	1,944 (0.9%)	p<0.001
2 (emergency)	1,260 (11.9%)	29,920 (13.6%)	
3 (urgent)	3,953 (37.5%)	91,069 (41.5%)	
4 (semi-urgent)	4,158 (39.4%)	76,222 (34.7%)	
5 (non-urgent)	1,144 (10.8%)	20,348 (9.3%)	
Episode end status			
Admitted to hospital	3,316 (31.4%)	78,309 (37.9%)	p<0.001
Discharged from ED	7,237 (68.6%)	128,580 (62.1%)	
ED presentations by facility peer group			
Principal referral hospital (j=5)	1,334 (12.6%)	55,326 (25.2%)	p<0.001
Acute hospital (group A) (j=13)	2,965 (28.1%)	94,604 (43.1%)	
Acute hospital (group B) (j=7)	1,474 (14.0%)	33,111 (15.1%)	
Acute hospital (group C) (j=21)	3,943 (37.4%)	30,415 (13.9%)	
Acute hospital (group D) (j=5)	837 (7.9%)	6,047 (2.7%)	
ED presentations by facility level of remoteness			
Major city (j=11)	2,708 (25.7%)	113,283 (51.6%)	p<0.001
Inner regional (j=15)	3,285 (31.1%)	57,507 (26.2%)	
Outer regional (j=19)	3,602 (34.1%)	39,816 (18.2%)	
Remote (j=3)	528 (5.0%)	6,862 (3.1%)	
Very remote (j=3)	430 (4.1%)	2,035 (0.9%)	

[†]Determined using logistic regression analysis; [‡]Age groupings as per QLD Health *Queensland Health Emergency*

Department Patient Experience Survey 2015; n = number of individuals; j = number of facilities; EDPES = Emergency

Department Patient Experience Survey; QLD = Queensland; ED = emergency department; TSI = Torres Strait Islander; ATS = Australasian Triage Score

Table 3: Average EDPES topic area (TA) scores for participants across different facility types and location (level of remoteness)

	TA1	TA2	TA3	TA4	TA5	TA6	TA7	TA8	TA9	TA10	TA11	TA12	TA14
	Mean ± Standard deviation												
All participants (n=10,553)	85.2 ±23.0	76.6 ±27.5	71.4 ±31.3	88.0 ±18.8	90.2 ±15.2	89.8 ±23.6	81.3 ±33.5	92.7 ±13.7	68.6 ±46.4	74.0 ±28.9	68.7 ±32.4	62.2 ±44.2	28.2 ±45.0
Level of remoteness	Mean ± Standard deviation												
Major city (j=11)	84.4 ±23.3	76.5 ±27.4	71.1 ±31.6	88.1 ±18.6	90.0 ±15.3	89.7 ±23.2	81.3 ±33.3	91.4 ±14.7	63.9 ±48.0	74.4 ±27.8	69.1 ±32.0	63.0 ±43.9	26.9 ±44.4
Inner regional (j=15)	85.5 ±23.0	76.7 ±27.5	71.5 ±31.3	87.9 ±19.1	89.9 ±15.5	89.6 ±23.6	81.1 ±33.7	92.3 ±13.8	69.4 ±46.1	73.1 ±29.7	68.9 ±32.8	63.2 ±44.2	28.8 ±45.3
Outer regional (j=19)	85.3 ±22.8	76.6 ±27.6	71.5 ±31.0	88.1 ±18.8	90.2 ±15.3	90.0 ±23.7	81.8 ±33.2	93.6 ±13.0	69.0 ±46.3	74.3 ±28.6	67.7 ±32.4	62.1 ±44.4	28.5 ±45.1
Remote (j=3)	84.6 ±22.6	77.1 ±26.1	71.0 ±31.5	87.5 ±19.2	91.0 ±13.1	90.1 ±21.9	81.0 ±34.4	92.6 ±14.3	81.3 ±39.1	76.7 ±29.6	70.3 ±31.6	57.5 ±44.4	29.1 ±45.5
Very remote (j=3)	86.3 ±22.1	76.7 ±27.7	72.5 ±31.5	89.1 ±17.1	91.6 ±12.7	88.8 ±26.8	79.1 ±33.7	95.9 ±9.7	72.6 ±44.7	72.5 ±30.4	70.0 ±32.0	56.7 ±45.0	27.7 ±44.8
p-value[†]	0.61	0.99	0.93	0.74	0.14	0.95	0.82	<0.01	<0.01	0.83	0.38	0.56	0.62
Facility type	Mean ± Standard deviation												
Principal referral (j=5)	84.5 ±23.9	76.4 ±27.4	72.5 ±31.3	88.9 ±17.5	90.0 ±14.8	89.9 ±23.7	82.6 ±32.4	91.2 ±15.1	61.2 ±48.8	74.2 ±27.3	69.6 ±31.8	65.1 ±44.2	27.6 ±44.7
Acute – Group A (j=13)	85.7 ±22.3	76.4 ±27.7	70.2 ±31.7	87.7 ±18.8	89.7 ±15.8	90.6 ±22.1	80.7 ±34.1	91.7 ±14.6	64.9 ±47.7	74.4 ±28.2	68.8 ±32.6	65.7 ±42.5	27.5 ±44.7
Acute – Group B (j=7)	84.7 ±24.0	76.7 ±27.5	71.1 ±31.6	87.5 ±19.2	89.9 ±15.4	89.3 ±23.1	80.7 ±33.9	91.8 ±14.2	72.1 ±44.9	71.4 ±31.7	68.9 ±31.7	61.1 ±45.1	28.3 ±45.1
Acute – Group C (j=21)	85.6 ±22.6	76.7 ±27.3	71.9 ±31.0	88.2 ±18.8	90.6 ±14.9	89.5 ±24.4	81.3 ±33.4	93.9 ±12.6	72.3 ±44.8	74.3 ±28.7	68.0 ±32.7	60.0 ±45.0	28.7 ±45.3
Acute – Group D (j=5)	84.3 ±23.8	77.0 ±27.5	72.2 ±30.8	87.9 ±19.8	90.5 ±14.5	88.6 ±25.1	82.0 ±32.9	94.2 ±11.6	69.9 ±45.9	75.4 ±29.0	69.3 ±32.2	59.2 ±44.4	28.5 ±45.2
p-value[†]	0.23	0.97	0.09	0.25	0.16	0.43	0.71	<0.01	<0.01	0.70	0.67	0.10	0.87

[†]Determined using one-way ANOVA; n = number of individuals; j = number of facilities; TA1 = Overall rating of care; TA2 = Arrival at the ED; TA3 = Waiting; TA4 = Doctors and Nurses; TA5 = Care and treatment; TA6 = Tests; TA7 = Pain; TA8 = Environment and facilities; TA9 = Leaving the ED – Delays; TA10 = Leaving the ED – Medications; TA11 = Leaving the ED – Information; TA12 = Leaving the ED – Coordination of follow-up services; TA14 = Complaints.

Figure 1: EDPES topic areas based on¹⁹ (*identifies items only asked of discharged patients)

Figure legend: Flow diagram depicting the EDPES topics areas as defined by QH, evidencing the flow of the survey in correlation to the patient journey through the ED.