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ORIGINAL ARTICLE

Quality of Care in a Paediatric Emergency Department

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Background

Measuring quality of care in a paediatric emergency department is challenging and there is lack of specific set measures to do so. The primary objective of this study was to determine the quality of care in our local paediatric emergency department by applying a set of quality indicators. The secondary objectives were to determine lacunae in quality of care and thus make suggestions for improvement.

Methods

A retrospective study was carried out using data collected from records of children presenting to the paediatric emergency department with a medical complaint between August and December 2019, during the first two weeks of each month. The Institute of Medicine Quality Domains were used to assess the quality indicators measured.

Results

Specific quality indicators require improvement including weight documentation, time to triage, and safety netting practices. A lack of quality indicators measuring patient-centeredness, staff experience, and equity was noted.

Conclusion

Suggestions, both for improving quality of care and its measurement, are made, in light of the new challenges faced by paediatric emergency departments.

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Introduction

A significant number of paediatric patients attend the emergency department (ED), and thus concerns about the access to and the quality of care provided are widespread. There are specific challenges when it comes to measuring quality of paediatric emergency care, related to the unique setting, children's dependency on others, their greater vulnerability, needs that vary according to age and development, different epidemiology, small numbers of patients with specific conditions, and lack of evidence due to limited studies available on urgent or emergent conditions in children.[1-2] Most measures have been developed for adult care and then extrapolated into paediatric practice,[2] and there is lack of measures which are specific for acute paediatric care.[3]

The aim of this study was to determine the quality of care in our Paediatric Emergency Department (PED) at Mater Dei Hospital, the only ED providing such a service to a population of around 0.5 million. It is a relatively young PED, having opened in 2015, seeing increasing number of patients (around 22,000 patients per year) and the development of new services. Thus, the question arises whether there is a gap between the expectations and realities of the quality of care delivered.

Paediatric quality measures are "reference point(s) against which data on child health care service provision can be assessed and quantified against clear criteria in terms of its quality domains".[2] A quality measure technically differs from a quality indicator in that the former incorporates the methods required to determine the performance of a quality indicator, and thus should have gone through testing to determine factors such as reliability, validity, and feasibility.[4] Since the exact definitions vary according to different countries,[2] for the scope of this study, the terms 'quality indicator', 'quality measure', or 'performance measure' are used interchangeably.

The primary objective was therefore to determine whether such quality indicators applied to the local setting are being reached. The secondary objectives were to determine the lacunae in our quality of care and thus make suggestions on how to improve measurement of quality of care and how to improve on these quality indicators.

Materials and Methods

Data was collected retrospectively from medical notes used in the PED supplemented by data collected from electronic record systems. Children under 16 years of age presenting with a medical complaint to the PED between August and December 2019, during the first two weeks of each month were studied. Surgical, ENT, Ophthalmic, and Psychiatric cases were excluded from the cohort. Ethics approval was obtained from the Faculty Research Ethics Committee of the University of Malta.

A literature review was carried out to define the quality indicators traditionally used to assess paediatric emergency care, followed by a discussion with the PED clinical lead about standards for emergency care that are followed locally to determine which quality indicators could be applied to the local setting (Table 1). Each quality indicator studied was also linked to a quality domain according to the Institute of Medicine (IOM).[5]

Table 1 Quality indicator goals, IOM quality domains, and study results

Quality Indicator	Goal	IOM Quality Domain	Our Result	Reference
Weight documentation	In 100% of cases	Safety Effectiveness	65.76% documented	Alessandrini et al, 2011[6]
Time to Triage	15 minutes	Timeliness Efficiency	46.40% within target Mean 19.94 minutes (95% CI 19.30, 20.59)	RCPCH Facing the Future, June 2018[7]
Time to FMC	Median time < 60 minutes	Timeliness Efficiency	Median time 45 minutes	CEM, 2011[8]
FTA rate	≤5%	Safety Patient-centeredness Timeliness	1.85%	CEM, 2011[8]
Lab turnaround time (intra-laboratory)*	60 minutes	Timeliness Efficiency	61.82% within target Mean 59.17 minutes (95% CI 55.35, 62.99)	Hawkins, 2007[9]
Time to A&E Ready**	4 hours	Timeliness Efficiency	91.65% within target Mean 121.37 minutes (95% CI 117.27, 125.48)	Guidance Handbook to the NHS Constitution for England[10]
Boarding time***	-	Safety Patient-centeredness Timeliness Efficiency	Documented in 65% Mean 165.17 minutes (95% CI 152.56, 177.78, median 139 minutes)	-
Documentation of warning signs	In 100% of cases	Safety Patient-centeredness	84.69% documented	RCPCH Facing the Future, June 2018[7]
Documentation of being given written advice	In 100% of cases	Safety Patient-centeredness	35.85% documented	RCPCH Facing the Future, June 2018[7]
Rate of unscheduled re-attendance	≤5% (within 7 days)	Effectiveness	3.65% (within 3 days)	CEM, 2011[8]

*Intra-laboratory lab turnaround time = time interval from when the sample is received by the laboratory to when the result is issued to the healthcare provider; differing from the total lab turnaround time (mean 91.62 minutes, 95% CI 85.95, 97.28, median 83 minutes), which also reflects how long a sample takes to arrive to the laboratory.

**A&E ready = when final patient disposition is decided

***Boarding time = time when a patient is transferred from the PED to the ward once the patient was set to be admitted

(IOM = Institute of Medicine, FTA = failed to attend, FMC = first medical contact)

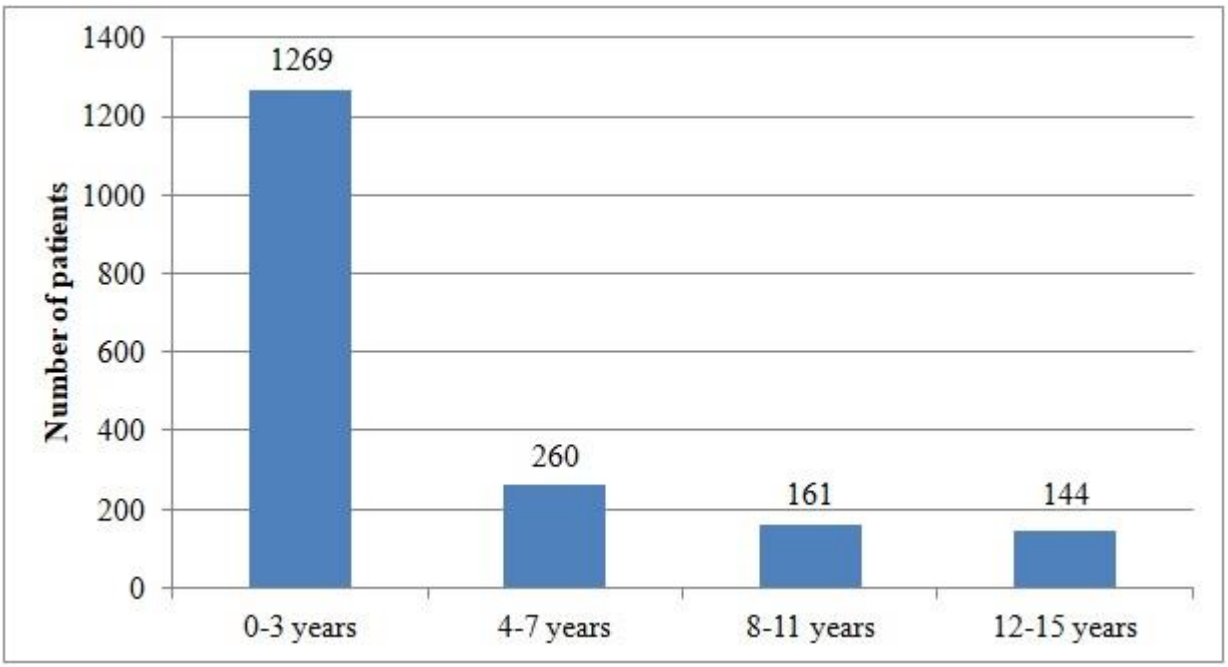
The aim was to not to come up with a comprehensive set of quality indicators, but to perform a general analysis of quality of care at our PED using routine data which is already collected at every ED visit as part of the process of care. Priority was given to indicators that measure the overall quality of the PED, rather than disease-specific measures.[4]

RESULTS

The total number of cases reviewed was 1834 with a slight male predominance (56% males). Upper respiratory tract infection was the commonest provisional diagnosis (22.36%), followed by gastroenteritis +/- dehydration (15.65%) and viral induced wheeze (7.69%). Most cases were discharged (72.46%); only 24.86% were admitted. The rest either discharged against medical advice or failed to attend when called for medical review. The majority of cases were of a higher Emergency Severity Index (ESI) triage category, that is, ESI-2 and ESI-3 (35.39% and 43.68% respectively). Children younger than 4 years attended the PED more than older age groups (69.19%), with 53.9% of these being 1-3 years old, 41.69% being infants (29-365 days), and 4.41% being neonates (0-28 days). (Figure 1)

The goals for each quality indicator were delineated from various sources describing standards of care in a PED and these were then compared to our results as shown in Table 1.

Figure 1 Age groups



Discussion

Improvement of quality of care can only be achieved if it is measured, but a lack of international standards makes performance measurement in paediatric emergency care challenging.[1-2,6,11]

There are various frameworks that can be used to aid measurement of quality of care.[12] In 2001, the IOM proposed six aims for improvement of healthcare, which are widely used in discussions on quality of care:

1. Safety;
2. Effectiveness;
3. Patient-centeredness;
4. Timeliness;
5. Efficiency;
6. Equity.[5,12]

A health care system that fulfils these aims benefits both patients and clinicians and is also beneficial in financial terms.[4-5] Furthermore, these principles can be applied in general terms as well as to disease-specific scenarios.[1] In this study, general measures were focused on using the IOM framework of quality domains.

Safety

Aiming to have safe quality care in a PED revolves around creating an environment which avoids harm to patients and staff. Documentation of weight ensures safe prescribing, and thus is a measure of safety. Weight is recommended to be documented in all cases but in this study weight was documented only in 65.76%. A possible explanation could be that not all cases required administration of medication or fluids (thus requiring weight for appropriate calculation).

Patients who leave the ED before being seen by a physician can be a safety concern and thus FTA (failed to attend) rates may also be a useful indicator of safety, albeit controversial. Long waiting times are often assumed to be the reason why a patient may leave; however, it is essential to remember that other factors may cause patients to leave prematurely.[13-14]

Boarding time, which is the time a patient spends waiting to be transferred to a ward once emergency care has been delivered and disposition has been decided, is crucial, both for continuation of treatment and for medico-legal issues. In this study, it was difficult to compute, and thus interpret, due to a lack of documentation. One possible explanation for this could be due to lack of designated documentation space on the local PED documentation sheet.

It is imperative that children and their parents/carers are provided, at discharge, with both verbal and written safety netting information, in a form that is accessible. 'Red flag' signs and symptoms should be explained and understood by parents or caregivers.[15-16] Explanation of warning signs prior to discharge was documented in the notes in 84.69% of the cases reviewed.[7] Remaining cases could be cases in which safety netting was not carried out, or carried out but not documented. A limitation to parents being given written advice could be that such advice merely does not exist in the department where this study was carried out; for example, leaflets on fever and vomiting exist, but not on bronchiolitis or asthma.

Alternative ways of safety netting could include telephone follow ups for results, telemedicine, and the use of discharge notes for written advice and for appropriate

handover to the patient's general practitioner.[5,15-16]

As improper documentation in this study could have possibly contributed to these results, a shift to electronic medical record keeping could make performance measurement more viable, less laborious, and more accurate.[1]

Effectiveness

Effective care is evidence based, with avoidance of underuse, overuse, and misuse. As mentioned earlier, weight measurement is important to ensure safety but it could also be a measure of effectiveness, as weight measurement at a PED visit should also be done to opportunistically assess growth in children.

Re-attendance to the PED might imply inadequate, and thus ineffective, care being given the first time round, lack of patient or carer satisfaction, or overuse of the service. However, it could also be due to a prolonged illness or deterioration, with parents/carers acting upon red flags explained previously.

Patient-centeredness

The physical environment of the PED should be welcoming for children, both in terms of putting them at ease and also in terms of having facilities which meet their needs and those of their carers, such as nappy changing facilities, breast feeding friendly space, and the availability of a play specialist. Such measures would help reduce fear, pain, and discomfort, ensuring a patient centred approach to improving quality of care.[5,7]

During our review of cases we noted that patients' and carers' feedback and complaints were rarely documented. Patient-reported measures, such as measures of satisfaction with care and experiences of care, provide the patient's perspective. These can indicate which areas of healthcare are of high quality and which need improving.[17] Patient feedback forms would be useful to assess the patient's and family's satisfaction of service.[17] Such suggested tools include the 'NHS Friends and Family Test' as well as the more paediatric-specific surveys available on the Royal College of Paediatrics and Child Health (RCPCH) Patient Reported Experience Measure (PREM) for urgent and emergency care website.[18]

Timeliness

Time-related indicators are prevalent since emergency care is focused on quick recognition and treatment of time-dependent critical conditions, with adequate disposition to the next level of care. Such quality indicators, including time to triage, time to first medical contact (FMC), FTA rate, lab turnaround time, time to A&E ready, and boarding time, are of vital importance because they help reduce ED overcrowding and improve patient flow.[11]

Triage practices should be enhanced by improving the triage waiting time. Additionally, if the triage waiting time exceeds 15 minutes there should be a system of prioritisation for full assessment. In the event of abnormal vital signs being recorded at triage, these parameters should be repeated within 60 minutes.[7]

Efficiency

An efficient healthcare system is one in which waste of resources, ideas, and energy is avoided. This can be challenging to measure; focus is often given to measurement of time-related indicators, but other variables should also be considered. For example, intra-departmental staff surveys could be used to assess if individuals feel that their ideas are being heard and employed. 'Staff experience' is, in fact, another measurement domain

proposed by the RCPCH.[3] In our study no indicators could be applied in these terms. Sørup et al. also noted that employee satisfaction and perspective have not been given due importance when assessing performance of emergency care.[11] This is a very important aspect in quality of care because it ensures sustainability and because staff is the biggest resource in healthcare.[3,11]

Equity

Care which is equitable should not vary because of personal characteristics, including gender, race, age, ethnicity, geographic location, disability, and socio-economic status. A limitation to this study was the lack of quality indicators in place which would ensure equitable care in the PED. This has been observed elsewhere; in a study by Alessandrini et al.,[6] only 0.5% of identified performance measures were related to equity. This fact, in and of itself, may indicate a lack of equity. It was noted that the information leaflets given to parents/carers are only available in the country's two main languages, but not all can understand or are able to read these written languages. Thus, one questions whether measures are being taken to ensure that patients from all countries and of all nationalities receive the same quality of care. The translation services in our PED are not available at all times of the day and are not readily available. The PED staff does not receive any training on how to improve our clinical interactions with different cultures. Another important aspect of equity is accessibility of the PED itself, including an environment accessible to patients with mobility issues as well as the visually and hearing impaired.

Apart from ensuring that all IOM quality domains are being addressed, the alternative ways of measuring quality of care could also be used. For example, using the Donabedian method, structure, process, and outcome could be assessed,[19] by looking into staffing numbers, the number of cubicles available for patient review, staff education and training, and use of electronic alert systems (such as for prescribing and drug allergies, and for adverse incident reporting). Disease-specific quality measures should also be explored, but these would require separate studies.

Focus on one particular indicator, with good results for one such specific measure, may not translate to good quality care as this might be at the cost of other quality measures. For example, in an attempt to transfer a patient to a ward within the four hour target, treatment may be missed or postponed.[11] A balance has to be reached between an adequate number of chosen quality indicators to allow for an extensive analysis and a manageable number to work with.[11] Furthermore the chosen quality indicators have to be shown to be valid and reliable before they can be applied to clinical practice.[6] Although applicability to the local setting is important, a joint set of quality indicators with other EDs would also be useful for benchmarking purposes.[11] Quality indicators should however be used in the context of quality improvement to promote change, rather than as a method of comparing one service to another or to show attainment of a standard.[4] Thus, various working groups may need to be set up to measure quality indicators, perform regular review (as opposed to one-off measurements), and propose interventions for improvement.

Limitations

This was a single centre study as data was collected from one hospital. Since this hospital provides the only paediatric emergency care in the country, the study was representative of national paediatric emergency care, but it may not reflect the quality of care provided in other centres. Also, the sample of population studied was taken over a period of five months, and, although it included both summer and winter months, it may not be representative of the whole year. As highlighted earlier, incomplete documentation led to the inability to assess all quality domains. This was further augmented by the retrospective nature of the study.

Conclusions

This study was carried out prior to the COVID-19 pandemic and the number of patients attending the PED then was relatively higher than more recent months. The COVID-19 pandemic has however put an additional strain on our paediatric emergency services, with the need for relocation, changing protocols, new infection control precautions, and high levels of uncertainty. With increasing number of patients now attending the PED again, an expected surge once the pandemic is over, and the need for relocation, paediatric emergency services have to be planned to ensure that our paediatric patients and their families receive the quality of care they deserve. We feel that we must guarantee that the good standards of care and the services offered in the past are maintained. This means that resources, the physical environment, and staff roles have to be re-planned to be in line with the new infection control measures.

The recommendations brought forward here, therefore, have to be taken in light of this situation. As suggested by the RCPCH, this can be a time when we can reset how healthcare for children is planned and delivered, and as the emergency crisis eases, restore paediatric services and recover healthcare professionals back into paediatrics.[20]

Summary Box

What is already known about this subject:

- There are various frameworks that can help measurement of quality of care, including the widely used six aims for improvement of healthcare by the Institute of Medicine.
- Studies have mostly focused on quality measures for adult care and then these have been extrapolated into paediatric practice.
- The unique setting and population of paediatric emergency care bring about specific challenges when measuring quality of care.
- The local paediatric emergency department is a relatively young department, still evolving and growing.

What are the new findings:

- A lack of quality indicators measuring patient-centeredness, staff experience, and equity was noted.
- Specific quality indicators requiring improvement include weight documentation, time to triage, and safety netting practices.
- Suggestions for improving quality of care and its measurement have to be done in light of the new challenges faced by paediatric emergency departments.

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