A tool for measuring health complexity in UK community paediatric caseloads

Barts Health NHS Trust

Why is this important?

As Community Paediatricians we often discuss the increasing medical complexity of the children we see, but find it difficult to demonstrate this in a simple way.

Our project offers a rapid, easy to use measurement, that assesses across a number of domains, much like the Apgar score used for neonates at delivery.

Methods

A scoring proforma was developed with multi-professional input, based on published eligibility criteria for paediatric hospice care[1,2] the Health Complexity in Community Paediatrics (HCCP) score (see handout or links below). The HCCP scoring tool was then validated as follows:

1. Inter-rater reliability was assessed in two ways. Initially two clinicians scored 23 real cases for children with complex needs (figure 1). Following this pilot, an on-line survey was completed by local paediatricians scoring devised, anonymised clinical letters (132 letters scored by 22 respondents).

2. To assess breadth of relevance, children were scored across four community paediatric settings - initial referrals, a complex needs special school, a virtual ward and palliative shared care.

3. The correlation between HCCP score and health service use was investigated for the 99 special school children. Data for a 6 month period was retrospectively collected for outpatient, inpatient and A+E episodes from the electronic records of the local hospital. Using the statistical tool Kendall's Tau-b, this was then compared to their HCCP score.

Results

Inter-rater reliability

Good inter-rater reliability of HCCP scores was demonstrated in both the initial pilot and online survey. Using Krippendorff's alpha, a value of 1 indicates perfect agreement and a value of 0 indicates the level of agreement you expect by chance.

- The pilot study of two observers yielded an alpha value of 0.93 (figure 1)
- The on-line survey yielded an alpha value of 0.79 -data not shown.

Community Caseload Scoring

The HCCP scores increased as expected across different caseloads within the service. (figure 2)

HCCP score and health service use

There was a significant correlation ($p < 0.05$) between the complexity scoring and three measures of hospital service use (figures 3 and 4)

Figure 1:
A plot comparing the HCCP scores for 23 complex children rated by two observers.

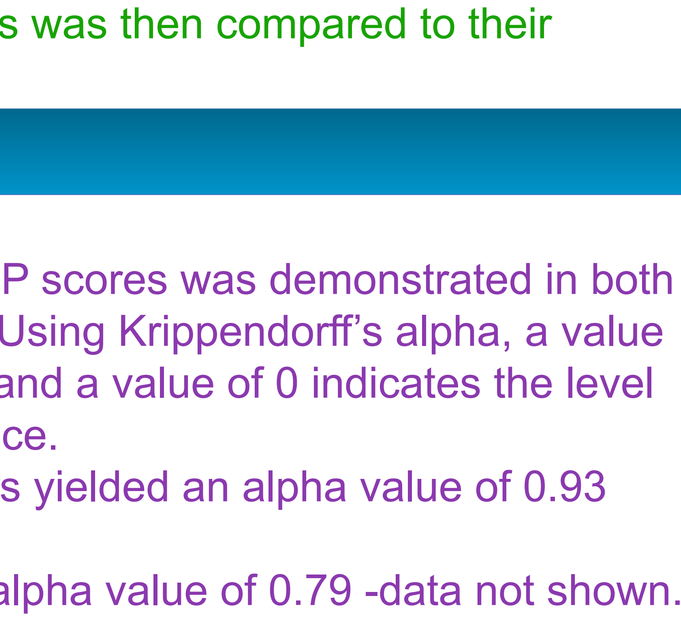


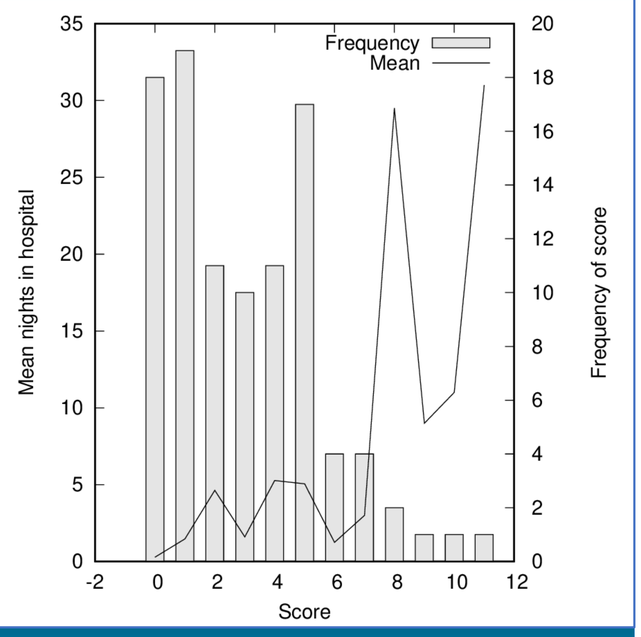
Figure 2: Community caseload scoring
Table of HCCP scores for children in different settings

	No. of children	Mean score	Range
Community Paediatric Referrals	59	0.12	0-3
Special School for profound and complex needs	99	3	0-11
Bridge Community Virtual ward for complex children	40	6	1-11
Palliative shared care	16	7.75	2-11

Figure 3:
Table demonstrating the Kendall's Tau-b correlation comparing the HCCP score with different measures of hospital service use

	Total number	Kendall's Tau correlation with HCCP score	z score	p value
Outpatient attendances	908	0.150	2.028	4.261×10^{-2}
A&E attendances	263	0.268	3.479	5.032×10^{-4}
Nights admitted in hospital	371	0.390	4.972	6.614×10^{-7}

Figure 4:
Clinical complexity score vs nights in hospital
A plot of the HCCP scores against mean number of nights in hospital for 99 special school children. Bars indicate number of children with each score.



Conclusion

The Health Complexity in Community Paediatrics scoring tool is reliable, and an individual's score predicts the likelihood of acute health service use.

This tool has value for children's care by anticipating acute health needs and optimising local service use.

Other functions, such as using the tool to inform discussions with families about advanced planning, and use in overall health system structuring and funding, could be explored.

HCCP Scoring Tool

Available at:
https://foolswood.github.io/complexity_score/
Or scan the QR code:

References

1. Harrop E, Edwards C. How and when to refer child for specialist paediatric palliative care. Arch Dis Child Educ Pract Ed 2013;98:202-8

2. M Williams, K Ruck, L Hayman. Palliative care for children in the community with static neurological conditions – are we getting it right? Archives of Disease in Childhood 2016;101:A305 doi:10.1136/ archdischild-2016-310863.502

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