PREDICTING THE NEED FOR TRANSITION FROM PAEDIATRIC PAIN SERVICES TO ADULT SERVICES IN CHILDREN AND ADOLESCENTS WITH CHRONIC PAIN

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ePPOC electronic persistent pain outcomes collaboration

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Introduction

Paediatric interdisciplinary pain management is effective for many children with chronic pain; however, a significant proportion of patients do not respond or relapse in the short-term. This group of poor responders, particularly adolescents who require transition to adult pain services, has not been well studied.

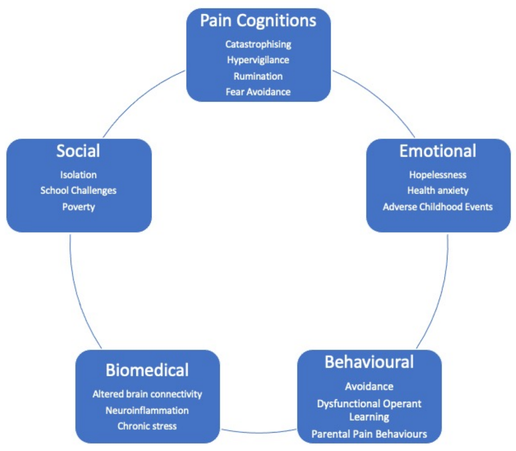

Figure 1 Interdisciplinary Pain Management Approach Using the Biopsychosocial model of pain

Aims

1. To characterise a cohort of patients referred to paediatric pain services across Australia who were subsequently referred to adult pain services.
2. To compare this group to peers in paediatric pain services who did not require transition to adult services.
3. To identify risk factors predicting the need for transition to adult services.

Method

This retrospective study utilised data from the adult electronic Persistent Pain Outcomes Collaboration (ePPOC) and the Paediatric (PaedePPOC) data repositories.

Participants

The paediatric data was categorised into two groups, those patients who were subsequently referred to adult pain services (n = 86) and those eligible by age to transition but were not referred to adult pain services (n = 1541).

Design

Both groups were comparatively analysed for demographic and clinical characteristics, health care utilisation, medication use and standardised pain questionnaire scores (Modified Brief Pain Inventory BPI, Functional Disability Inventory FDI, Paediatric Quality of Life Inventory PedsQL and the Bath Adolescent Pain Parent Impact Questionnaire BAPPIQ). Variables that were significantly different between the two groups were entered into a logistic regression analysis as predictor variables, with the need for transition to adult services as the dependent variable.

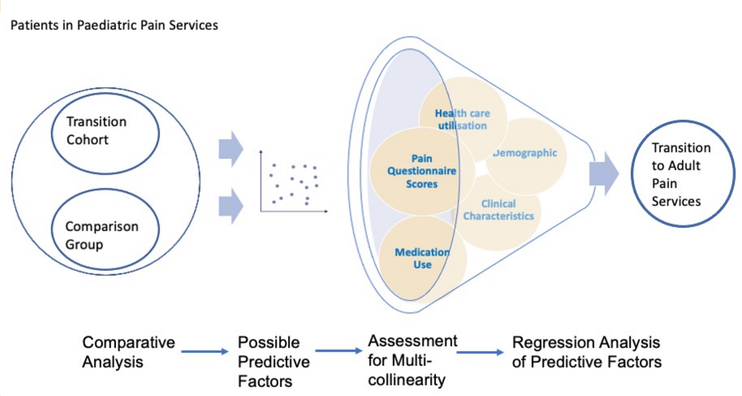

Figure 2 The experimental method

Statistical analysis

The data was assessed for normal distribution with Q-Q plots and histograms. Data with normal distribution were analysed with two sample t-tests and non-parametric data with the Wilcoxon Ranked Sum test. Pearson chi-square tests were used to assess group differences for categorical variables with the level of significance set with a p value of 0.05. Variables shown to be statistically significantly different on analysis of means or distribution were assessed with bivariate Pearson correlations (> 0.7) to check for multi-collinearity. We examined variables found to be significantly different between groups as possible predictors of the need to transition to adult services using a logistic regression model. The predictors included in the model were; age, BPI pain severity, FDI total, PedsQL total, BAPPIQ helplessness and catastrophising, daily anti-inflammatory use, compensation case and Health Care Utilisation.

Results

Cohort Characteristics

The Transition group were older, but both groups were majority female, born in Australia or New Zealand with similar clinical characteristics; pain (main site, duration, description, source), comorbidities (chronic disease, mental health, cancer), and disability (visual, hearing intellectual, physical). Both groups reported moderate to severe pain intensity and disability, low quality of life, high health care utilisation and high carer distress.

	Transition cohort (n = 86)	Comparison group (n = 1541)
Age		
Mean (SD)	15.4 (1.3)	14.4 (1.6)
Median	16	15
IQR	15-16	13-15
Range	11 – 18	9 - 19
Sex, n (%)		
Male	17 (19.8)	397 (25.8)
Female	69 (80.2)	1144 (74.2)
Country of birth, n (%)		
Australia/New Zealand	62 (95.4)	1074 (92.4)
Other	< 5 (<5.0)	88 (7.6)

Table 1 Patient Demographic Characteristics

Patient Reported Assessments

The Transition cohort experienced significantly higher pain intensity and disability, lower quality of life, higher health care utilisation and carer distress than the Comparator peer group.

Assessment tool/domain	Transition cohort Mean (SD)	Comparison group Mean (SD)	p-value
Brief Pain Inventory			
Pain severity	6.1 (1.6)	5.5 (1.9)	p = 0.02*
Worst pain	8.2 (1.4)	7.7 (1.8)	p = 0.004**
PedsQL			
Physical	33.4 (21.7)	39.3 (21.1)	p = 0.03*
Emotional	41.9 (23.1)	49.7 (22.9)	p = 0.006**
Social	55.6 (23.8)	65.2 (22.9)	p < 0.001**
School	37.4 (25.3)	44.7 (22.3)	p = 0.01*
Psychosocial	44.9 (19.6)	53.2 (18.3)	p < 0.001**
Total	40.9 (19.1)	48.4 (17.3)	p < 0.001**
Functional Disability Index (FDI)	29.7 (13.1)	26.4 (11.8)	p = 0.03*

* p<0.05 **p<0.01

Table 2 Patient Reported Pain Assessment Questionnaire Scores at Referral

Risk Factors Predicting Transition

Three factors predicted transition, including compensation, daily anti-inflammatory medication use, and older age.

Variable	Odds ratio (OR)	95% confidence interval
Age	**1.683**	**1.301-2.176**
BPI Pain Severity	1.105	0.906-1.348
FDI Total	0.984	0.942-1.027
PedsQL Total	0.988	0.959-1.018
BAPPIQ Catastrophising	1.063	0.961-1.175
BAPPIQ Helplessness	1.013	0.947-1.083
Anti-inflammatory medication		
Daily use	**2.004**	**1.028-3.907**
Other	1	
Compensation case		
Yes	**4.218**	**1.185-15.008**
No	1	

Hosmer-Lemeshow test, p-value = 0.3565
C-statistic (AUC) = 0.779

Table 3 Regression Analysis

Parental Impact

As shown in Table 4, the Bath Adolescent Pain Parent Impact Questionnaire, carers in the Transition cohort reported significantly higher catastrophising and helplessness scores, relative to the Comparison group

Bath Parent Impact Questionnaire	Transition cohort Mean (SD)	Comparison group Mean (SD)	p-value
Depression	15.6 (6.4)	14.5 (6.4)	p = 0.17
Anxiety	10.1 (4.9)	9.3 (5.1)	p = 0.25
Catastrophising	**11.7 (4.2)**	**9.9 (4.3)**	**p = 0.002****
Helplessness	**14.7 (5.5)**	**12.6 (6.3)**	**p = 0.01***
Partner relationship	10.9 (5.4)	10.7 (5.7)	p = 0.79
Leisure functioning	17.1 (5.3)	16.4 (5.5)	p = 0.33
Parental behaviour	28.3 (5.0)	27.4 (6.0)	p = 0.26
Parental strain	9.7 (5.8)	8.6 (5.1)	p = 0.08
Total	115.2 (24.1)	108.1 (30.8)	p = 0.06

* p<0.05 **p<0.01

Table 4 Carer Reported *Bath Parent Impact Questionnaire* at Referral (BAPPIQ)

Clinical Implications

This study has characterised a cohort of paediatric patients needing transition to adult pain services. These findings suggest that patients can be risk stratified for need to transition at referral to paediatric pain services, by screening for; cases involving compensation, daily use of NSAIDs, and older age. The worst pain scores for the Transition group were high and notable for being higher than the most severely affected ePPOC adult age demographic. Worst pain scores should be screened for at referral to paediatric services. This data supports screening for high parental catastrophising and helplessness which are prevalent amongst carers for adolescents who are referred to adult pain services. We hypothesise that high carer catastrophising and helplessness are associated with an impaired ability to validate the child's pain experience and may in part mediate the high pain scores and disability that characterise this group.

Conclusion

Children and adolescents referred to paediatric pain services who subsequently need transition to adult pain services are a uniquely vulnerable and disabled group. At initial referral they experience significantly higher pain intensity, disability, have higher health care utilisation, lower quality of life, and the carers for these patients experience higher distress beyond that experienced by peers and their carers in paediatric pain services who do not need referral to adult services.

We have identified three baseline characteristics that predict the need for referral to adult pain services. This research enables paediatric pain services to screen for children more likely to need transition and to facilitate early and specific transition care for those that do.

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