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Enhancing pain care with the American Pain Society Patient Outcome Questionnaire for use in the emergency department (APS-POQ-RED): validating a patient-reported outcome measure

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ABSTRACT

Background In general, the quality of pain care in emergency departments (ED) is poor, despite up to 80% of all ED patients presenting with pain. This may be due to the lack of well-validated patient-reported outcome measures (PROMs) of pain care in the ED setting. The American Pain Society-Patient Outcome Questionnaire-Revised Edition (APS-POQ-R), with slight modification for ED patients, is a potentially useful PROM for the adult ED, however it is yet to be completely validated.

Methods Adult patients, who had presented with moderate to severe acute pain, were recruited at two large inner-city EDs in Australia. A modified version of the APS-POQ-R was administered at the completion of their ED care. Responses were randomly split into three groups and underwent multiple rounds of exploratory and confirmatory factor analysis with testing for construct, convergent, divergent validity and internal consistency.

Results A total of 646 ED patients (55.6% female), with a median age of 48.3 years, and moderate to severe pain on arrival, completed the ED-modified APS-POQ-R. Psychometric evaluation resulted in a reduced nine-question tool, which measures three constructs (pain relief and satisfaction (α=0.891), affective distress (α=0.823) and pain interference (α=0.908)) and demonstrated construct, convergent, divergent validity, and internal consistency.

Conclusions This new tool, which we refer to as the American Pain Society-Patient Outcome Questionnaire-Revised for the ED (APS-POQ-RED), should form the basis for reporting patient-reported outcomes of ED pain care in future quality improvement and research.

WHAT IS ALREADY KNOWN ON THE TOPIC

⇒ Pain is the most common symptom on presentation to the emergency department and is widely reported as poorly treated.

⇒ A range of patient-reported outcomes are used as outcome measures in quality improvement and research in the emergency department. However, many of these have poor, or no, validity in the setting.

WHAT THIS STUDY ADDS

⇒ This study presents a psycometrically validated instrument for measuring the patient-reported outcomes of acute pain care in the adult emergency department.

HOW THIS RESEARCH MIGHT AFFECT RESEARCH, PRACTICE AND/OR POLICY

⇒ This shortened, emergency department-specific patient-reported outcome measure (APS-POQ-RED) seeks to provide a standardised, validated measure of patient-reported outcomes of acute pain care in the ED for quality and research purposes.

INTRODUCTION

Pain is the most common symptom in people who present to emergency departments (ED).[1 2] However, due to a lack of well-validated tools to measure patient-reported outcomes (PROs) of pain care in the ED setting, pain care outcomes from the patient's perspective are not well understood.[3] This makes it difficult to assess and improve the quality of pain care in the ED. Unidimensional measures of pain intensity are only partially valuable tools because they are limited in scope and fail to account for the multidimensional experience of pain.[4–6] Time-based metrics, such as 'time to be seen' and 'time to first analgesic medication', assume that 'faster is better' and provide only a superficial view of the health services' response to pain rather than the outcomes experienced by the patient.[7–9] Furthermore, there are only weak associations between the PROs (such as patient experience) and time-based metrics,[9] meaning the patient may receive poor outcomes despite timely care. Previously it has been reported that ED patients have poor recall of the pain care they receive however have a better recall of the outcomes of this care.[10] The symptom of pain and how a patient responds to pain treatment

are specific to the individual and best reported by the individual experiencing the symptom.[3] Thus, measurement tools must reflect pain's subjectivity and individual responses to care[11] from the only person who can accurately gauge the outcome, the patient experiencing the symptom.

In its simple form, a PRO is 'a measurement of any aspect of a patient's health status that comes directly from the patient'.[12] When considering a symptom such as pain, PROs offer a measurement of the patient's perspective of the outcomes of care.[13] The incorporation of the patient's perspective of care can have a significant impact on the delivery of effective care and influence change in the manner in which care is delivered.[14] While PROs of pain care have been reported in quality and research activities in the ED, the description of their development and validation within this environment is limited. The majority of patient-reported outcomes measures (PROMs) used in the ED are taken directly from other settings without modification or validation,[3] which may limit the patient's understanding of the instrument and the accuracy of any derived measurements.[15]

The most promising and easily modifiable PROM for use in ED is the revised edition of the American Pain Society's Patient Outcome Questionaire (APS-POQ-R).[3 16] It encompasses five broad but essential domains of pain: intensity, patient satisfaction, side effects of medications, emotional and physical functioning. Our initial exploratory factor analysis of a modified APS-POQ-R for use in the ED demonstrated potential construct and discriminate validity based on patient urgency in a single centre.[16] However, the lack of testing of the proposed structure in an additional sample leaves the construct validity and internal consistency incomplete.[15] To overcome these limitations of the previous work[16] and provide significant evidence of the validity and reliability[15] of a modified APS-POQ-R, we conducted a multisite, multistage study of the APS-POQ-R, modified for use in the adult ED using elements of classical test theory.

METHODS

Aims and objectives

This study aims to take the previously described adaptation of the APS-POQ-R, which has demonstrated incomplete validity and assesses the construct validity and internal consistency in adults presenting to the ED with moderate to severe pain. The specific objectives are to:

1. Test the construct validity of a previously described structure[16] of the APS-POQ-R modified for use in adults in the ED.
2. Propose a new construct structure for the modified version of the APS-POQ-R
3. Test the new construct structure proposed in objective two.

Setting

The study was conducted at the EDs of two principal referral hospitals in Brisbane, Australia, with data prospectively collected between September 2021 and January 2022. Both of these ED's are located in inner-city hospitals with a universal healthcare system. The Royal Brisbane and Women's Hospital is the principal referral centre for the state, and sees all adult presentations and specialities with a census of approximately 85 000 per year. The Prince Charles Hospital is located in a large tertiary hospital and sees all adult and paediatric presentations with a census of approximately 100 000 per year. [17]

Instrument

The original APS-POQ-R[18] is an interviewer-administered PROM that was developed for postoperative and cancer-related pain and has been used or adapted to other forms of pain,[19] translated into several languages[20–22] and demonstrates cross-cultural validity.[23] In studies in the adult ED, the APS-POQ-R has been used as a PROM, either in part[4 5 24 25] or in translated (Danish) entirety.[26] However, except for the Danish translation, the validity of the APS-POQ-R in the ED setting has not been fully established. The APS-POQ-R contains two sections, 18 questions that originally mapped to five constructs and a second section that describes the use of non-pharmacological analgesia. Consistent with previously reported validity, this work focuses on the first section.[18]

In a previous study,[16] we conducted an exploratory factor analysis (EFA) of a version of the APS-POQ-R slightly modified to better suit patients with moderate to severe acute pain in the ED setting, retaining 18 questions from the original APS-POQ-R.[18] Those modifications consisted of changes to the wording of questions related to the reporting timeframe, that is, the phrase '…(in) the first 24 h in the hospital or after your operation' was changed to '…in the emergency department'. There was also an unintentional modification due to a transcription error, in which the question about how much the pain caused the patient to feel anxious was omitted. In the current study, we repeated this Exploratory Factor Analysis (EFA) by including the question about anxiety. Furthermore, an additional modification was made in this work. The two questions relating to the effects of pain on sleep (in the ED) were excluded from the analysis (for objectives two and three) because of their lack of relevance to acute pain in the ED setting.

Participants

Patients were elidgible for inclusion if they presented to ED with acute pain for less than 6 weeks and had an initial documented or self-reported pain score of 4/10 or greater. In addition, patients were ineligible if there were triaged into the most urgent category (Australasian Triage Scale, category one), intoxicated with alcohol or other drugs, aged below 18 years, unable to give consent, did not speak English or had cognitive impairment.

Data collection

For each participant, data were collected by a research nurse directly into an electronic data capture form

(RedCap, Vanderbilt University) using a tablet computer following study enrolment. In addition, information that the patient did not provide was collected from the ED Information System. Data included the participant's age, sex, mode of arrival to the ED, Charleston comorbidity score and time from ED arrival to the first analgesic medication.

Sample and sample size

We used a convenience sample of patients who met the inclusion criteria. During the shifts of the research nurses (0700–1600, Monday to Friday), consecutive ED patients were approached by the research nurse and invited to participate. Patients were only enrolled after their ED care had been completed, either before discharge or while awaiting admission to the hospital. No patients were enrolled once they had left the ED.

The minimum sample size was calculated based on 18 questions over three stages of data analysis. While there is some conjecture around sample size in factor analysis, a sample size of 10 responses per question or an overall sample size of 200 (for less than 40 questions) is deemed adequate.[15 27] Therefore, we aimed to collect 200 participants per objective or 600 participants across the two sites. Funding for research assistants was available for 18 weeks at each site, and while we aimed for a minimum of 200 patients at each site, data collection would continue until the end of the 18 weeks.

Statistical analysis

The methods and statistical analysis used in this work are based on the previous revision of the APS-POQ-R,[18] the factor analysis described in the first revision of the APS-POQ-R for the ED[16] and the process and measures described by Frost *et al*.[15] Data were analysed using SPSS (IBM Corp. Released 2021. IBM SPSS Statistics for Windows, Version 28.0. Armonk, NY: IBM Corp). Descriptive statistics were used to summarise the population characteristics. Continuous data were summarised using means and SD. Frequencies and percentages summarised categorical data. The population was split into three even groups using random number allocation (random.org), and each group was used to test one of the objectives. Analysis of variance and the χ^2 tests were used to determine between-group differences in characteristics (table 1). Finally, the responses to the 18 questions in the APS-POQ-RED were summarised as means and SD for all patients and each group (table 2).

The previously described fit of the APS-POQ-R modified for use in the ED was tested with confirmatory factor analysis (CFA) in IBM Amos V.28. The fit of this structure was assessed using the Root Mean Square Error of Approximation (RMSEA), Comparative Fit Index (CFI) and Tucker-Lewis Fit Index (TLI).[28] The model was considered a good fit if the CFI and TLI were greater than 0.9[29] and the RMSEA was less than 0.08.[30]

EFA (principal axis factoring) was then conducted using IBM SPSS V.28, with a Promax rotation and Kaiser Normalisation, to identify a new structure within the current data. Models with eigenvalues greater than 1 were investigated for the best statistical and clinical fit. Questions were considered loading to a factor if the coefficient was at least 0.4. In addition, the discriminant validity (correlation between factors) and internal consistency (Cronbach alpha) for each factor were reported within the final proposed structure.

The structure of the APS-POQ-R proposed in the EFA was then tested using CFA in IBM Amos V.28. The fit of this structure was assessed using the RMSEA, CFI and TLI[28] with the previously defined thresholds. Construct validity of the final APS-POQ-R tool was assessed using Composite Reliability (CR) for internal validity (good CR≥0.7), convergent and divergent validity was assessed using Average Variance Extracted (AVE) and Maximum Shared Variance (MSV). Convergent and discriminant validity indicate how individual items correlate with their latent factors. Convergent validity measures the level of variance explained by a construct versus the level due to measurement error and can be judged by AVE≥0.5, whereas discriminant validity compares the amount of the variance explained by each construct to the shared variance of other constructs to ensure that each construct measures different aspects. Therefore, MSV should be less than AVE and the square root of AVE greater than inter-construct correlations.[31–33]

Ethical considerations

This study received approval from the Human Research Ethics Committee of the Royal Brisbane and Women's Hospital. All patients gave written informed consent after explaining the study by one of the research assistants and were free to withdraw from the study until publication.

Patient and public involvement

Patients were not involved in the planning or conduct of this this study. However, patients recruited to the study were given the option of receiving a copy of the outcomes at the time of consent.

Results

A total of 653 patients were recruited for the study across the two sites. One patient withdrew consent after data collection, one was under 18 years at the time of consent and five who never experienced more than 3/10 pain in the ED were excluded from data analysis. This left a total sample of 646 patients, randomly split into three groups of 215, 215 and 216. Table 1 shows no statistically significant between-group differences in demographic or clinical characteristics. Table 2 summarises the answers to each question of the APS-POQ-R for the three groups and the whole sample.

Confirmatory factor analysis

The previously described structure was tested using CFA on group one as described in the methods. The structure of the model and individual factor loadings can be found in the online supplemental material (online

Table 1 Description of the population and differences between groups

	Total	Group one	Group two	Group three	Test	P value
Age (mean, SD)	48.3 (19.2) years	46.9 (19.0) years	48.8 (19.0) years	49.35 (19.6) years	F(2,643) = 1.006	0.366
Sex (n, %)					$\chi^2(4)$= 3.778	0.437
Female	359 (55.6)	122 (56.7)	121 (56.3)	116 (53.7)		
Male	283 (43.8)	93 (43.3)	93 (43.3)	97 (44.9)		
Other	4 (0.6)	0 (0.0)	1 (0.5)	3 (1.4)		
MOA (n, %)					$\chi^2(4)$= 6.249	0.181
Walk-in	386 (59.8)	131 (60.9)	130 (60.5)	125 (57.9)		
Ambulance service	257 (39.8)	84 (39.1)	85 (39.5)	88 (40.7)		
Other	3 (0.5)	0 (0.0)	0 (0.0)	3 (1.4)		
ATS category (n, %)					$\chi^2(6)$= 5.196	0.519
Two	97 (15.0)	27 (12.6)	38 (17.7)	32 (14.8)		
Three	369 (57.1)	129 (60.0)	114 (53.0)	126 (58.3)		
Four	165 (25.8)	52 (24.2)	60 (27.9)	53 (24.5)		
Five	15 (2.3)	7 (3.3)	3 (1.4)	5 (2.3)		
Charlson score (mean, SD)	2.0 (2.8)	1.9 (2.8)	1.9 (2.6)	2.2 (2.9)	F(2,643) = 0.839	0.432
Receipt of analgesia (n, %)					$\chi^2(2)$= 1.979	0.372
Yes	592 (91.6)	197 (91.6)	193 (89.8)	202 (93.5)		
No	54 (8.4)	18 (8.4)	22 (10.2)	14 (6.5)		
TTA (mean, SD) min	74.1 (73.2)	73.4 (78.6)	72.8 (71.9)	75.9 (69.1)	F(2,589) = 0.097	0.907

ATS, Australasian Triage Scale; MOA, mode of arrival; TTA, time to first analgesic medication.

supplemental figure 1). This model did not prove to be a good fit when tested. The CFI reported for this model ranged from 0.605 to 0.715, well outside the 0.900 threshold considered a good fit. The RMSEA for this model was 0.153 (90% CI 0.143 to 0.164, p<0.001), also well above the 0.08 threshold for a good model fit. Standardised factor loadings ranged from 0.22 to 1.01, with three of the five subscales having factors that loaded less than the 0.7 minimum. Therefore, this data had a poor fit for the previously proposed structure. Analysis progressed to identify a new structure using EFA.

Exploratory factor analysis

An EFA conducted on group two data resulted in a Kaiser-Meyer-Olkin measure of sampling adequacy of 0.792, and a statistically significant Bartlett's test of sphericity (χ^2 (120) = 1539.0, p<0.001). A solution with up to five factors (subscales) had an Eigenvalue of greater than 1. Considering the structure, questions and analysis, a three-factor solution, consisting of the pain relief and satisfaction subscale, the affective distress subscale and the pain interference subscale, explained 53.6% of the variation in the data, was selected as the solution to undergo further CFA. The four and five-factor solutions split questions into constructs that did not demonstrate clinical applicability or a clear concept. Table 3 shows the internal consistency of each of the three factors, and box 1 outlines the eliminated questions. Online supplemental table 1 shows the pattern matrix for the three-factor solution.

Confirmatory factor analysis

A CFA was conducted on group three data. The overall structure and coefficients of the analysis are shown in online supplemental figure 2. All of the questions loaded to the factors at >0.7. The fit indices indicated that the model was a good fit: TLI=0.959, and CFI=0.973, both meeting the minimum threshold of 0.900. The RMSEA was 0.079 (90% CI 0.052 to 0.106, p=0.039) indicating a reasonable fit.

Online supplemental table 2 demonstrates the validity and reliability of the model presented. In online supplemental table 2A, the CR of the three constructs presented is greater than 0.7 and therefore demonstrates the reliability of these constructs.[31]

Table 2 Summary of responses from the first nine questions of the modified APS-POQ-R

	Total			Group one			Group two			Group three		
Question	**N**	**Mean**	**SD**	**N**	**Mean**	**SD**	**N**	**Mean**	**SD**	**N**	**Mean**	**SD**
On this scale, please indicate the least pain that you had in the emergency department.	646	2.26	2.32	215	2.50	2.40	215	2.28	2.27	216	2.01	2.29
On this scale, please indicate the worst pain you had in the emergency department.	646	7.78	1.90	215	7.93	1.88	215	7.82	1.85	216	7.60	1.95
How often were you in severe pain in the emergency department? Please select the best estimate of the percentage of time you experienced severe pain.	646	6.94	3.28	215	3.53	3.49	215	3.00	3.13	216	2.68	3.18
Select one number that best describes how much pain interfered or prevented you from:												
Doing activities in bed such as turning, sitting up, repositioning?	646	6.16	3.27	215	6.20	3.34	215	6.23	3.27	216	6.06	3.20
Doing activities out of bed, such as walking, sitting in a chair, standing at a sink?	646	6.28	3.23	215	6.35	3.23	215	6.32	3.19	216	6.17	3.28
Falling asleep?	646	4.82	3.72	215	5.29	3.73	215	4.85	3.70	216	4.33	3.68
Staying asleep?	646	4.37	3.79	215	4.88	3.86	215	4.29	3.81	216	3.96	3.67
Pain can affect our mood and emotions. On this scale, please select the one number that best shows how much the pain caused you to feel:												
Depressed?	646	1.48	2.87	215	1.87	3.22	215	1.05	2.40	216	1.52	2.89
Frightened?	646	2.34	3.24	215	2.35	3.27	215	2.30	3.20	216	2.38	3.26
Helpless?	646	2.90	3.56	215	2.98	3.66	215	2.95	3.55	216	2.77	3.48
Anxious?	646	3.93	3.45	215	4.06	3.52	215	3.78	3.37	216	3.95	3.48
Have you had any of the following side effects? Please select 0 if no. Please circle the number that best shows the severity of each:												
Nausea?	646	2.18	2.97	215	2.22	2.99	215	1.87	2.73	216	2.44	3.17
Drowsiness?	646	1.00	2.22	215	1.13	2.34	215	0.95	2.23	216	0.91	2.08
Itching?	646	0.37	1.46	215	0.35	1.47	215	0.39	1.41	216	0.39	1.49
Dizziness?	646	0.91	2.03	215	1.09	2.29	215	0.75	1.77	216	0.89	1.98
In the emergency department, how much relief of your pain did you receive?	646	3.03	3.11	215	3.49	3.32	215	3.01	2.99	216	2.60	2.97
Were you allowed to participate in decisions about your pain treatment as much as you wanted to?	646	4.48	3.16	215	4.67	3.20	215	4.38	3.15	216	4.39	3.14
Select one number that best shows how satisfied you are with the results of your pain treatment in the emergency department?	646	2.13	2.35	215	2.19	2.40	215	2.28	2.36	216	1.93	2.27

All items were measured on a scale of 0 (0%) to 10 (100%), where 0 equalled a positive outcome (ie, no pain) to 10 equated to a negative outcome (ie, worst possible pain). Questions 7, 8 and 9 have been recoded to match the direction of the other answers.
APS-POQ-R, American Pain Society-Patient Outcome Questionnaire-Revised Edition.

The average variance explained for each of the three constructs is greater than 0.5 therefore, the three constructs demonstrate convergent validity.[33] Discriminant validity is demonstrated in online supplemental table 2A, where the MSV is less than the average variance explained and in table six, where the square root of the AVE is greater than the interconstruct correlations.[32]

Table 3 Subscale item to total correlations and Cronbach alpha for a three-factor solution

	Scale mean if item deleted	Scale variance if item deleted	Corrected item-total correlation	Cronbach's alpha if item deleted
Pain relief and satisfaction subscale (Cronbach alpha=0.891)				
1.On this scale, please indicate the least pain that you had in the emergency department?	8.29	57.12	0.776	0.861
3.How often were you in severe pain in the emergency department?	7.58	47.08	0.744	0.874
7.In the emergency department, how much relief of your pain did you receive?	7.56	45.31	0.860	0.821
9.Select one number that best shows how satisfied you are with the results of your pain treatment in the emergency department.	8.29	57.63	0.715	0.879
Affective distress subscale (Cronbach alpha=0.823)				
5.Pain can affect our mood and emotions. On this scale, please select the one number that best shows how much the pain caused you to feel				
B.Frightened?	6.72	39.63	0.655	0.780
C.Helpless?	6.33	35.99	0.696	0.739
D.Anxious?	5.15	36.23	0.687	0.748
Pain interferance subscale (Cronbach alpha=0.908)				
4.Select one number below that best describes how much pain interfered or prevented you from:				
A.Doing activities in bed such as turning, sitting up, repositioning?	6.32	10.16	0.832	+
B.Doing activities out of bed such as walking, sitting in a chair, standing at the sink?	6.23	10.69	0.832	+

Discussion

In this three-stage prospective validation of the APS-POQ-R for acute pain presenting to the adult ED, we have identified nine questions that map to three latent constructs (subscales). In patients presenting to the ED with moderate to severe acute pain. These nine questions measure the PROs of pain relief and satisfaction, affective distress and pain interference. This demonstrates the utility of the modified APS-POQ-R in measuring PROs of pain care in the adult ED. Therefore, our revised edition of the APS-POQ-R for acute pain in the ED will now be known as the APS-POQ-RED.

Box 1 Questions removed from the instrument

2. On this scale, please indicate your worst pain in the emergency department?
5.Pain can affect our mood and emotions. On this scale, please select the one number that best shows how much the pain caused you to feel:
A. Depressed.
6. Have you had any of the following side effects? Please select '0' if no; if yes, please circle the number that best shows the severity of each.
A. Nausea.
B. Drowsiness.
C. Itching.
D. Dizziness.
8. Were you allowed to participate in decisions about your pain treatment as much as you wanted to?

The structure described in the previous adaptation of the APS-POQ-R[16] could not be replicated within this study, despite one of the study locations being the same and replicating the inclusion and exclusion criteria. This highlights the limitations of reporting only EFA as a measure of construct validity without the concurrent use of CFA in a separate sample.[15] The generalisability of an EFA model to a CFA model is significantly influenced by several factors, such as the assumption of error within the data set and the distributional assumption of the data collected.[34] The limitations of this earlier work have been overcome in the study presented by ensuring that both EFA and CFA are completed on separate samples collected simultaneously within the same population.

The pain severity and satisfaction subscale is the first of the three latent constructs measured within the revised

tool, comprising the least pain severity the patient reported in the ED, how often they were in severe pain, the amount of relief and their overall satisfaction. This construct correlates well with the most commonly measured PROs in the ED literature (pain intensity and patient satisfaction)[16] as well as the two of the constructs measured in the initial development of the APS-POQ-R (pain severity and sleep interference, perceptions of care).[18] The relief of pain, including the endpoint of pain relief, has been previously shown to be highly correlated with patient satisfaction. Taylor *et al* have shown that targeting adequate analgesia (decrease of at least two points until the pain is rated as less than four on an 11-point scale) is associated with high levels of patient satisfaction.[4 25] Time to first analgesic medication has been shown to influence patient satisfaction as a surrogate measure of the time in severe pain.[9] This construct is related to treatment. In future studies of patient-reported pain care outcomes using the APS-POQ-RED in the ED, this construct should be correlated with the treatment given, including time to the first analgesic medication.

The affective distress subscale comprising the degree to which the patient felt frightened, anxious or helpless because of their pain was the second subscale identified in the revised tool. Pain rarely exists without co-occurring symptoms such as anxiety.[35 36] Alterations in the affective functioning of the patient can be a result of the pain, the lack of knowledge of the cause or the treatment and receiving care in an environment that may be unfamiliar and imposing. The relationship between pain and affective distress is well acknowledged within the paediatric ED pain literature, with numerous interventions designed to reduce both.[37–42] However, only 19% of PROs reported in the adult literature include emotional functioning as an outcome of pain care.[3] A recent review of pain and anxiety measures in the adult ED found that no measure of the co-occurring symptoms of anxiety and pain had been reported in practice outside of quality improvement or research spheres.[36] The acknowledgement of affective (emotional) distress as an outcome of effective pain care in the adult ED is the first step in acknowledging co-occurring symptoms (or symptom clusters) within the adult ED.

The third subscale identified within the tool is the pain interference subscale. This subscale identified the impact of pain on the patient's physical functioning through its two questions. Pain is known to impact the patient's ability to function; however, this relationship is not linear as seemingly minor pain can impair a patient's function.[6] Reduction in function can often be the precursor to patients seeking care in an ED. A lack of functional improvement secondary to disease progression is a leading cause of representation.[43 44]

The instrument presented in this work has several uses within the ED. The first use is to measure the outcomes of interventional and quality improvement studies in a consistent manner that is comparable across studies. With an increasing focus on the pharmacological treatment of pain in the ED, the use of objective PROMS in interventional studies, especially opiate alternatives and sparing projects, allows the patient voice to complement other outcomes of the intervention. This instrument goes beyond simple intensity measurement, acknowledging that pain is a multifaceted experience. This instrument gives voice to factors such as side effects and the amount of relief felt by the patient in a simple way that is capturable in the unique ED setting. The use of this instrument as an outcome measure in interventional studies in the ED ensures that the impact of the intervention is captured from the patient perspective. The second way this instrument may be useful is in identifying the relationship between process/health service outcomes of pain care in the ED and those reported by the patient. Previous work in this area has demonstrated a poor relationship between process measures and patient-centred outcomes, however, the outcome measures used were limited and not validated for acute pain in the ED.[9] The reduction in the number of questions within the instrument has distinct importance in the ED where patients may be time limited and patient flow is important. However, there is also an inherent limitation in the reduction of the questions, meaning some outcomes are not longer measured. Correlations with the measures described above will add further strength to the reduction in questions. However, this instruments usage in the ED may still be limited to interventional studies and Quality Improvement activities, as asking nine questions in routine care may be onerous on overstretched clinicians. Aspects of this instrument, such as the pain relief and satisfaction subscale, may be more useful in everyday care, as four questions would be more achievable in routine care.

Conclusion

In this work, we have demonstrated the structural validity and internal consistency of a modified version of the APS-POQ-R for use in moderate to severe acute pain within the adult ED. The modified version, which we call the APS-POQ-RED, uses nine questions to measure three subscales (pain relief and satisfaction, affective distress and pain interference subscales). The modification of the instrument to focus on care received in the ED, as well as the removal of irrelevant questions, have made this a specific, validated tool for use in quality improvement and research activities within the ED.

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