

5.5 Pediatric Ulcerative Colitis Activity Index (PUCAI)

Adapted from a question by Dr. Jacob Robson (Epi 204, 2013).

When it is bad, ulcerative colitis causes frequent, bloody stools and abdominal pain. However, due to modesty (and general disgust with talking about poop), some children have trouble quantifying their symptoms sufficiently to help their clinicians to make treatment decisions. Therefore, Turner et al[1] created a Pediatric Ulcerative Colitis Activity Index (PUCAI) with specific questions about symptoms. However, it's time consuming for physicians to go through the PUCAI with children or parents. Lee et al[2] studied whether patients could reliably report the PUCAI directly to their doctors by comparing patient-completed and physician-completed PUCAI in 70 children, dividing the PUCAI into 3 disease activity groups. Results are shown in Table 2, reprinted with permission below.

TABLE 2. Comparison of the patient-completed PUCAI with the physician-completed PUCAI by disease activity groups (n = 70)

	Patient-completed PUCAI*			Kappa (95% CI)
	Inactive (n = 30)	Mild (n = 24)	Moderate/severe (n = 16)	
Physician-completed PUCAI				0.78 [†] (0.65–0.90)
Inactive (n = 36)	30 (100%)	6 (25%)	0 (0%)	
Mild (n = 20)	0 (0%)	17 (71%)	3 (19%)	
Moderate/severe (n = 14)	0 (0%)	1 (4%)	13 (81%)	

CI = confidence interval; PUCAI = Pediatric Ulcerative Colitis Activity Index.

* Percentages are based on column totals.

[†] Scale of agreement: poor (<0), slight (0.01–0.20), fair (0.21–0.40), moderate (0.41–0.60), substantial (0.61–0.80), and near perfect (0.81–0.99) (12).

Reprinted with permission from: Lee JJ, Colman RJ, Mitchell PD, Atmadja ML, Bousvaros A, Lightdale JR.

Agreement between patient- and physician-completed Pediatric Ulcerative Colitis Activity Index scores. *J Pediatr Gastroenterol Nutr.* 2011;52(6):708-13.

https://journals.lww.com/jpgn/fulltext/2011/06000/Agreement_Between_Patient__and_Physician_completed.11.aspx

a.) What was the observed percent complete agreement in this study?

b.) What percent complete agreement would be expected from the marginals?

c.) The researchers report an unweighted Kappa statistic of 0.78. Is their calculation correct (± 0.01)?

d.) Explain in words what this Kappa signifies.

e.) Is the disagreement between patient- and physician-completed PUCAI scores *balanced*? Support your answer with numbers from the table and explain what this means.

f.) The researchers are disappointed that, based on their Kappa, their agreement is only “substantial.” They feel like they deserve half credit when ratings are off by one category, such as when the MD classifies the disease as inactive and the patient classifies it as mild. Calculate a weighted Kappa using that weighting scheme.

1. Turner D, Otley AR, Mack D, Hyams J, de Bruijne J, Uusoue K, et al. Development, validation, and evaluation of a pediatric ulcerative colitis activity index: a prospective multicenter study. *Gastroenterology*. 2007;133(2):423-32.
2. Lee JJ, Colman RJ, Mitchell PD, Atmadja ML, Bousvaros A, Lightdale JR. Agreement between patient- and physician-completed Pediatric Ulcerative Colitis Activity Index scores. *J Pediatr Gastroenterol Nutr*. 2011;52(6):708-13.