

Evaluation of an automated facial recognition software application for assessment of pain

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Background and aims: Pain management amongst patients with cognitive dysfunction (e.g. dementia) is problematic, particularly when the carer shares the responsibility of providing analgesia. Numerous pain scales have been developed to assist carers to assess patients' pain status; most of which include items derived from the American Geriatric Society Guidelines of Persistent Pain 2002. To reduce the subjective nature of these scales, we

facial and non-automated (non-facial) indicators. The electronic Pain Assessment Tool (ePAT) is an app integrated in a smart device. This validation study aims to assess the feasibility of using the facial domain of the ePAT in

Methods: Participants (n= 43, [21 male, 22 female], mean age= 54 ±14) with chronic pain were recruited from various primary care settings including pharmacies and GP clinics using purposive sampling. Each participant completed a pain questionnaire, derived from consensus recommendations of the international interdisciplinary experts on assessment of pain in older adults. The questionnaire included self-rating scales - the Visual Analogue Scale (VAS), the Numerical Rating Scale (NRS) and the Verbal Descriptor Scale (VDS), which are validated measures of pain. The researcher (MA) who administered the ePAT was blinded to the questionnaire responses. Facial assessments using

recording signs of pain (AU score) and each of the standard pain scores (VAS, NRS, VDS) was performed. Sensitivity was examined.

Results:

questionnaire measures of pain (t-tests or Wilcoxon: $p < 0.0001$ for each measure). These measures were then

Cross tabulations of the categorised AU score against these binary variables showed that a high AU score had over

Conclusions: The ePAT was able to identify the distinctive facial patterns associated with chronic pain with assessment of pain in the cognitively impaired.

