

A Novel Approach for Autism Spectrum Condition patients with Eating Disorders: Analysis of Treatment Cost-savings

Short Running Title: Clinical Pathway for Comorbid ED and ASC

Kate Tchanturia^{123*}, Yasemin Dandil¹, Zhuo Li, Katherine Smith¹, Monica Leslie¹, Sarah Byford⁴

¹ King's College London, Department of Psychological Medicine, Institute of Psychology, Psychiatry and Neuroscience, UK.

² South London and Maudsley NHS Foundation Trust, London, UK.

³ Department of Psychology, Illia University, Tbilisi, Georgia.

⁴ King's College London, Health Service & Population Research Department, Institute of Psychology, Psychiatry & Neuroscience, UK.

***Corresponding Author:** Professor Kate Tchanturia – kate.tchanturia@kcl.ac.uk - 103 Denmark Hill, Section of Eating Disorders, London SE5 8AF, United Kingdom

Acknowledgments: The Health foundation an independent charity committed to bring better health care for people in the UK ([Ref: AIMS ID](#)): 1115447 and the Maudsley Charity for their support. Maudsley Charity is an independent NHS mental health charity which works in partnership with patients and families, clinical care teams and researchers at South London and Maudsley NHS Foundation Trust, the Institute of Psychiatry, Psychology and Neuroscience, King's College London, and community organisations, with a common goal of improving mental health, to support innovation, research and service improvement.

Data Availability Statement: Data will be made available upon reasonable request to the corresponding author.

The authors declare no conflict of interest.

Abstract

Objective: In the current economic context, it is critical to ensure that eating disorder (ED) treatments are both effective and cost-effective. We describe the impact of a novel clinical pathway developed to better meet the needs of autistic patients with EDs on the length and cost of hospital admissions.

Method: The pathway was based on the Institute for Healthcare's Model of Improvement methodology, using an iterative Plan, Do, Study, Act format to introduce change and to co-produce the work with people with lived experience and with healthcare professionals. We explored the change in length and cost of admissions before and after the pathway was introduced.

Results: Preliminary results suggest that the treatment innovations associated with this pathway have led to reduced lengths of admission for patients with the comorbidity, which were not seen for patients without the comorbidity. Estimated cost-savings were approximately £22,837 per patient and approximately £275,000 per year for the service as a whole.

Conclusion: Going forward, our aim is to continue to evaluate the effectiveness and cost-effectiveness of investment in the pathway to determine whether the pathway improves the quality of care for patients with a comorbid ED and autism and is good value for money.

Highlights

- Autism spectrum condition (ASC) patients with a comorbid eating disorder (ED), tend to require longer hospital stays than ED patients without this comorbidity.
- We co-produced a novel clinical pathway for patients with the ASC/ED comorbidity with service users and clinicians following a needs assessment.
- The implementation of this novel clinical pathway is associated with shorter hospital stays and lower costs of admission for patients with the ASC/ED comorbidity.

Keywords: Eating disorders; autism spectrum disorders; treatment; health economics

Introduction and Aims

In the current economic context, resources available to the public health system have become increasingly scarce and more precious than ever. Anorexia nervosa (AN), a severe eating disorder (ED) associated with great risk to physical health (NICE, 2017), can be associated with long hospital stays, which are costly to the National Health Service (NHS). However, several researchers have demonstrated evidence of the benefits of short hospital stays (Herpertz-Dahlmann et al., 2014; Strandjord et al., 2016). Indeed, the National Institute for Health and Care Excellence (NICE) guidelines recommend only 4-6 weeks of hospital admission for patients requiring inpatient treatment for anorexia nervosa.

One of the challenges in treating AN and ensuring the duration of hospitalisation is kept brief, is the common complex presentation of one or more comorbid psychiatric disorders. Recent research has demonstrated that many patients with AN (between 20-37%) have a diagnosed or suspected autism spectrum condition (ASC; Westwood and Tchanturia 2017). It is important to note that although autism spectrum disorder (ASD) is the term used for medical diagnosis, we use instead the term autism spectrum condition (ASC), which is preferred by our patients (Kenny et al., 2016).

Over the past eight years, we have collected data from clinical audit records for an adult inpatient ward for ED (the South London and Maudsley National Health Service specialist ED service). We found that autistic people with comorbid ED had longer durations of stay in hospital and poorer clinical outcomes upon discharge, including higher levels of depression and anxiety and lower levels of work and social functioning, when compared to non-autistic patients with eating disorders (Tchanturia, Adamson, Leppanen & Westwood, 2019).

The purpose of this brief report is to explore the impact of the development of a novel clinical pathway for patients with comorbid ED and ASC: The Pathway for Eating disorders and Autism developed from Clinical Experience (PEACE pathway) on the length and cost of hospital admissions before and after the pathway was introduced.

Method

In 2018, the Health Foundation supported us with a £75,000 grant to conduct training with experts in the field of ASC. This funding was used to provide our multidisciplinary ED team with training in the administration of gold-standard measures of ASC, such as the Autism Diagnostic Observation Schedule, 2nd Edition (ADOS-2; Lord et al., 2012) and the Autism Diagnostic Interview-Revised (ADI-R; Rutter, Le Couteur & Lord, 2003), and to provide our clinical multidisciplinary team with relevant training in adapting multiple treatments for the needs of autistic patients or those with high autistic traits.

In total, we have provided up to 20 training events for the multidisciplinary health care team, including training focused on individual therapy adaptation, some focused on specific characteristics often seen in autistic patients, such as sensory sensitivities, and some focused on PEACE implementations and how to apply and maintain these. In addition, we invested in materials necessary to create a more ASC-friendly ward environment, including redecorating the ward to create a neutral colour scheme, developing a 'sensory box' for patients with items such as weighted blankets and sensory toys, and we began hosting wellbeing groups for autistic patients and for those without autistic traits together with members of the multidisciplinary

team to support sensory difficulties and enhance social communication (for example, introducing communication passports and other strategies).

Based on the knowledge attained from the training provided by experts in the ASC field, our ED clinicians have adapted their understanding of comorbidity treatment to incorporate this. As a clinical team, we have revised psychological treatment protocols to be more flexible for the specific, individual needs of this patient group. This includes making sure that we spend more time on engagement in psychological work to allow rapport to build, as well as revising and adapting specific therapeutic exercises to make them more concrete and tangible. When appropriate, we do this using nonverbal materials and aim to utilise patients' strengths, which is especially important when thinking about their communication styles where we encourage them to express themselves in ways, they feel comfortable, be this through artwork or experiential work. As a result of the training, we have adapted how all modalities of treatment provided by the multidisciplinary team take place. With guided materials, clinicians are supported in making individual sensory adaptations and thinking holistically about the individual, and the strengths that come with their autism.

Adaptations began in January 2018 with the implementation of ADOS-2 assessment for ASC and the full PEACE pathway was available from January 2019 (see **Figure 1** for a full outline of the timeline for the changes implemented). To explore the impact of the pathway on hospital admissions and the cost of these admissions, we collected data on hospital admissions from clinical records for six years before the new pathway was introduced (1st January 2012 to 31st December 2017) and two years after the new pathway was introduced (1st January 2018 to 31st December 2019) for ASC patients. We compared this with the same data for patients without co-morbid ASC combined with those not assessed for ASC, to provide a conservative comparison. We estimated the average cost of these admissions by applying the national average unit cost per night for patients admitted to adult specialist eating disorder services for the financial year 2018/19 (£532.32), taken from the National Schedule of National Health Service (NHS) Costs (<https://improvement.nhs.uk/resources/national-cost-collection/#ncc1819>).

Results

Figures 2 and 3 present the duration of admissions data for ASC and non-ASC patients with eating disorders who were admitted between January 2012 and December 2019. The figures show a clear reduction in the average duration of admissions for those with co-morbid ASC since the PEACE pathway started. Mean length of admissions for patients admitted during the six years before the implementation of the PEACE pathway was higher for ASC patients with eating disorders (133 days; 19 weeks) than those without comorbid ASC (109 days; 16 weeks). This pattern reversed in the two years following the implementation of the PEACE pathway (comorbid ASC 90 days; 13 weeks versus no ASC 118 days; 17 weeks).

In terms of cost, the mean cost per admission prior to the implementation of the PEACE pathway was almost £13,000 higher for ASC patients with eating disorders (£70,925 per patient) compared to non-ASC patients (£58,218 per patient). After the implementation of the pathway, the average cost of admissions was almost £15,000 lower for those ASC patients with eating disorders (£48,087 per patient) compared to those without comorbid ASC (£62,896 per patient). Given a reduction in mean cost per admission of £22,837 per ASC patient with an eating disorder after the implementation of the pathway compared to before implementation,

and an average of 12 ASC patients with eating disorders admitted per year, estimated total savings are in the region of £275,000 per year.

Discussion

Initial indications suggest that a modest investment in staff training and adaptations to treatments and wards to better meet the needs of autistic patients can reduce the length of hospital admissions for these complex co-morbid cases and generate cost savings in the region of £275,000 per year for the service as a whole.

However, what is harder to count, but nevertheless of great importance, is the treatment experience of patients and carers, reflected in their positive feedback and improvements in outcomes. A formal assessment of satisfaction with the PEACE pathway and outcomes for autistic patients with eating disorders has not yet been undertaken, but initial indications from discharged patients are positive. For example, one PEACE patient noted:

“The adaptations to my individual psychology sessions have really helped me engage in treatment for the first time as it has taken into account all of my autism and eating disorder needs.”

A further important aim of the PEACE pathway implementation was to increase the confidence of the clinical team. Over the course of the PEACE project, we have evaluated each training session in terms of clinicians’ confidence and ability to adapt treatment to benefit those with comorbid autism. Evaluation of 100 training attendees suggested that confidence of clinicians in supporting this comorbidity increased on average from 46% to 68%. In addition to these promising figures, qualitative evaluations from the clinical team give a richer understanding of the benefits. For example, comments from clinicians include the following:

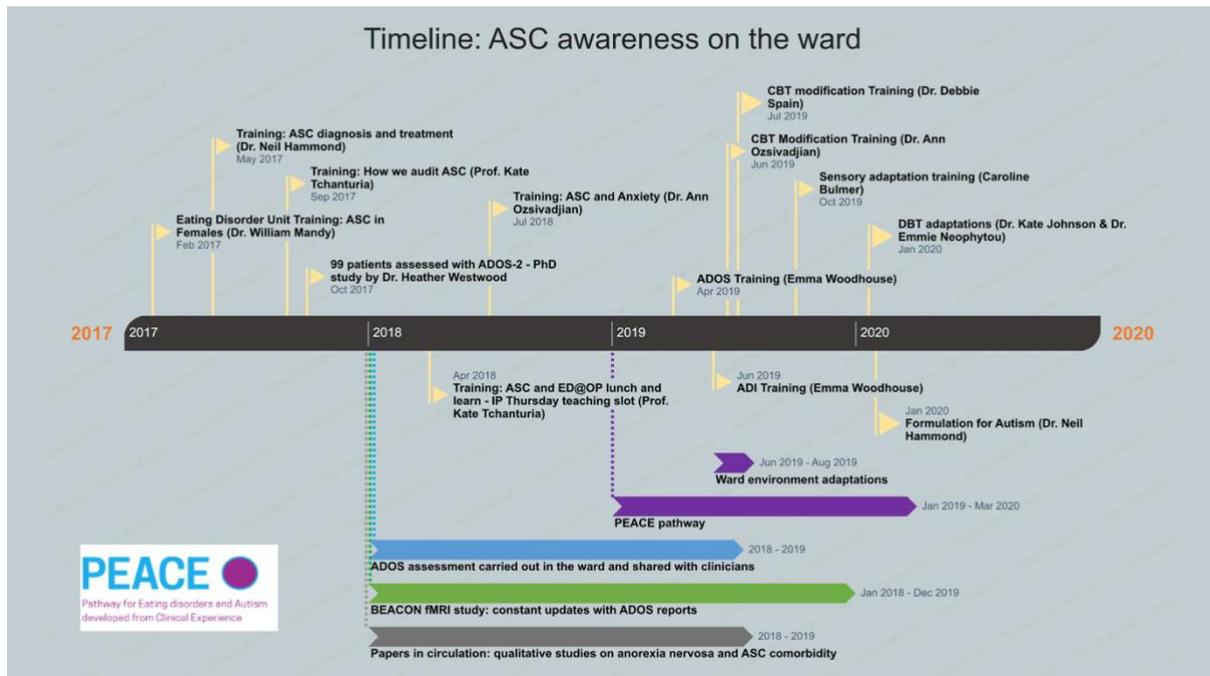
“The PEACE pathway has really helped me to think about the specific needs of people in our treatment settings with the additional challenges of Autism symptoms and how we can best make adaptations to make the experience more manageable and treatment more effective.”

“Training taught me how to be more inclusive and individualise, how to be creative in making materials, that it is ok to simplify materials.”

“I think the strongest aspect of the training was the focus on practical examples about how to explain sometimes complex/abstract theoretic concepts to autistic patients in a concrete way.”

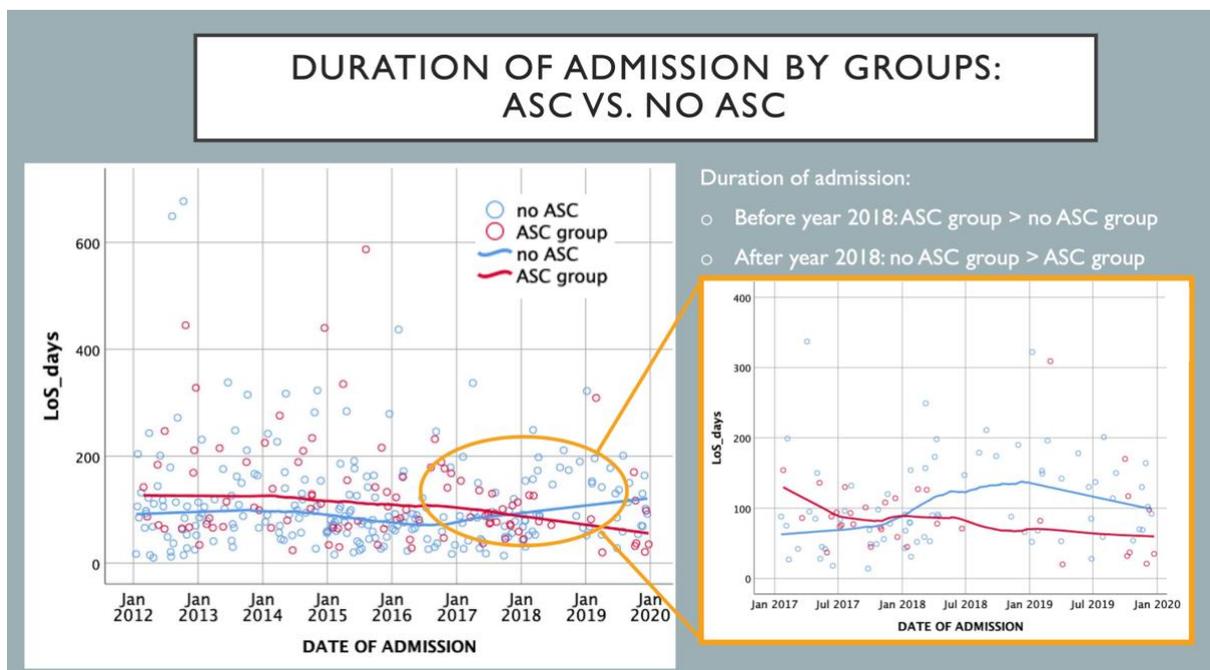
We are still in the early stages of developing and assessing the effectiveness and cost-effectiveness of our novel clinical pathway. Going forward, our aim is to continue to explore whether investment in the PEACE pathway will ultimately make a significant difference in improving the quality of care for patients with the ASC/ED comorbidity and can do this in a cost-saving manner.

Figure 1. Timeline of activities implemented through the PEACE pathway.



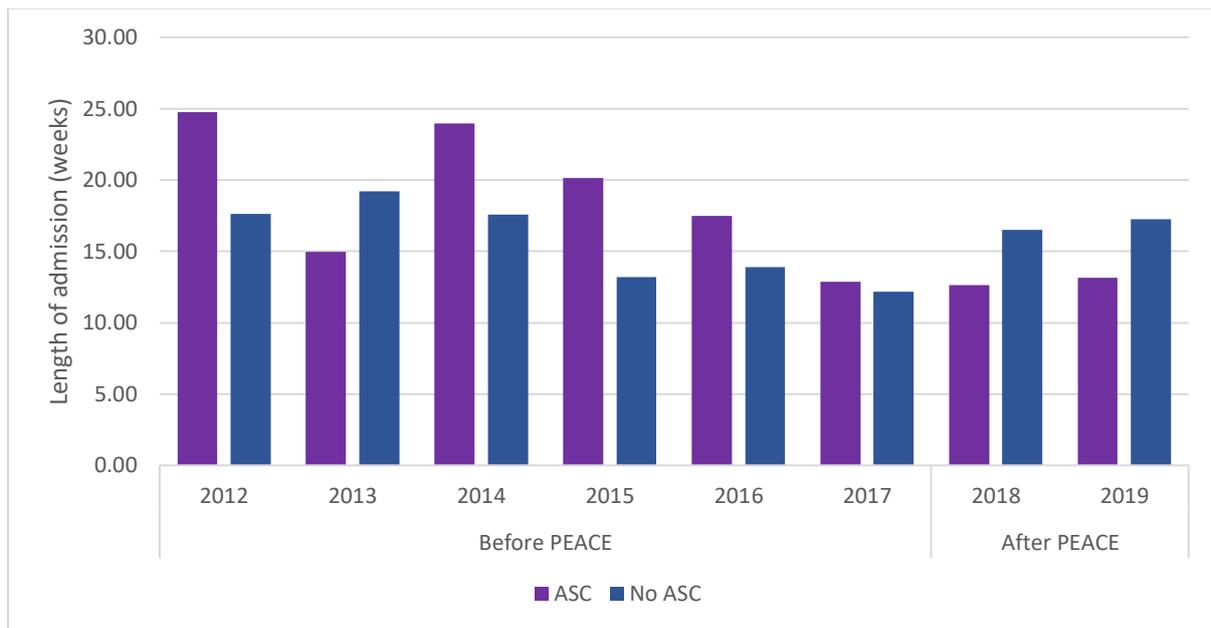
Note: ASC = autism spectrum condition; PEACE = Pathway for Eating disorders and Autism developed from Clinical Experience.

Figure 2. Duration of admission by patient group.



Note: ASC = autism spectrum condition.

Figure 3. Length of admission in weeks by patient group.



References:

- Herpertz-Dahlmann, B., Schwarte, R., Krei, M., Egberts, K., Warnke, A., Wewetzer, C., ... & Hagenah, U. (2014). Day-patient treatment after short inpatient care versus continued inpatient treatment in adolescents with anorexia nervosa (ANDI): a multicentre, randomised, open-label, non-inferiority trial. *The Lancet*, 383(9924), 1222-1229.
- Kenny, L., Hattersley, C., Molins, B., Buckley, C., Povey, C., & Pellicano, E. (2016). Which terms should be used to describe autism? Perspectives from the UK autism community. *Autism*. <https://doi.org/10.1177/1362361315588200>
- Lord, C., Rutter, M., DiLavore, P. C., Risi, S., Gotham, K., Bishop, S. (2012). Autism diagnostic observation schedule, second edition. Torrance, CA: Western Psychological Services.
- National Institute for Health and Clinical Excellence. (2017). Eating Disorders: recognition and treatment. *NICE Guideline (NG69)*.
- Rutter, M., Le Couteur, A., Lord, C. (2003). ADI-R. Autism Diagnostic Interview Revised. Manual. Los Angeles: Western Psychological Services.
- Strandjord, S. E., Sieke, E. H., Richmond, M., Khadilkar, A., & Rome, E. S. (2016). Medical stabilization of adolescents with nutritional insufficiency: a clinical care path. *Eating and Weight Disorders-Studies on Anorexia, Bulimia and Obesity*, 21(3), 403-410.
- Tchanturia, K., Adamson, J., Leppanen, J., & Westwood, H. (2019). Characteristics of autism spectrum disorder in anorexia nervosa: A naturalistic study in an inpatient treatment programme. *Autism*, 23(1), 123-130. doi: 10.1177/1362361317722431.
- Westwood, H., Tchanturia, K. (2017). Autism Spectrum Disorder in Anorexia Nervosa: An Updated Literature Review. *Current Psychiatry Reports*, 19(7), 1-10. doi: 10.1007/s11920-017-0791-9