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**Abstract Title:** An observational cohort study to examine SPUR, a patient-reported outcome measure of medication adherence, as a predictor of admission and early readmission in patients living with Type 2 Diabetes

**Introduction**: Conservative estimates suggest that the cost of poor medication adherence (MA) to healthcare systems in the UK is close to £800Mn annually, however figures may be as high as £920Mn to £224Bn across larger parts of Europe and the US.(1) This may be attributed to the relationship between poor MA and an increased risk of hospital admission.(2) Often, cases are preventable and hence present an opportunity for avoidable costs if appropriately identified and managed, such as in the case of early readmissions (admissions occurring within 30 days of discharge). However, despite the association between MA and admissions, to date no predictive model has been developed that integrates a holistic Patient-Reported Outcome Measure (PROM) of MA. This study evaluated one such PROM, known as SPUR, as a predictor of general admission and early readmission in patients living with Type 2 Diabetes (T2D).

**Aim**: This study sought to develop a predictive model of early readmission and general admission risk using the SPUR tool as a PROM of MA in patients living with T2D.

**Methods**: Using an observational study design, 6-month retrospective and prospective patient monitoring were conducted to assess the number of admissions and early readmissions during the observational period. Outcomes were reported as binary and count variables. Patients were previously recruited from a large London NHS Trust as part of a cross-sectional study to validate SPUR. Covariates of interest included: age, ethnicity, gender, education level, income, the number of medicines and medical conditions, and Covid-19 diagnoses. A Poisson or negative binomial model was employed for count outcomes, with the exponentiated coefficient indicating incident ratios (IR) [95% CI]. For binary outcomes (Coefficient, [95% CI]), a logistic regression model was developed.

**Results**: Data were available for 200 patients. The modal age range was 70-79 years (n=74/200, 37.0%). Most participants were GCSE educated (42.5%), white (76.0%), and over a third female (36.0%) identified as female. For general admission risk as a count variable, a higher SPUR score (increased adherence) was significantly associated with a lower number of admissions (IR = 0.98, [0.96, 1.00]). Other factors associated with an increased risk of admission included: age ≥80 years (IR = 5.18, [1.01, 26.55]), GCSE education (IR = 2.11, [1.15 – 3.87]), number of medical conditions (IR = 1.07, [1.01, 1.13]), and a positive Covid-19 diagnosis during follow-up (IR = 1.83, [1.11, 3.02]). SPUR remained significant when modelled as a binary variable (-0.048, [-0.094, -0.003]). For early readmission, only the SPUR score was significantly predictive of the outcome as a binary variable (-0.051, [-0.094, -0.007]), indicating that those with a higher SPUR score were at less risk of an early readmission.

**Conclusion**: The study successfully developed a predictive model for both general admission and early readmissions in patients living with T2D using the SPUR tool and several covariates of clinical relevance. However, a small sample size is noted as a limitation. Future work may look to integrate SPUR as a holistic PROM of MA to support the development of tailored interventions to reduce patients' risk of admission.

**References:**

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