Background Sport specialization is being widely implicated as a cause of increasing youth injury and drop out rates. No published data encompasses the variety of variables that define the individual athletes’ sports participation history. The literature currently evaluates the impact of sports specialization on injury using univariate analysis. There are multiple potential factors that impact injury that need to be considered.

Objective To develop an appropriate analysis plan to determine the impact of sports specialization compared to multiple sport participation on injury incorporating age at which sport participation began in the sport specialized in and age at which specialization in the target sport relative to current age as a function of duration of participation in years.

Design Statistical Analysis Comparisons.

Setting Academic University.

Patients (or Participants) Professional athletes.

Interventions (or Assessment of Risk Factors) Yrs of participation, specialization, current age.

Main Outcome Measurements Impact of Sport Specialization.

Results We compare the assumptions and results of modelling the time to event outcomes sports injury with different analysis methods and time scales. The relationship between the time scale and the outcome is non-parametric and very flexible, while the relationships between adjustment variables and the outcome are not as flexible if standard modelling approaches are used (Cox model). Investigators should weigh this and their scientific question of interest when selecting an analysis approach. In our scenario, we felt that modelling time to injury with a time varying covariate representing specialization, possibly adjusted for the age participants started the main sport, with time to injury measured from the age that the individual started playing their main sport, provided useful insight into the impact of sports specialization compared to multiple sport participation on injury.

Conclusions The presented methodology is a recommendation for future researchers to consider when collecting and presenting data.