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PERFORMANCE PROFILES & PEAK AGE OF ADOLESCENT TRIPLE JUMP CONTESTANTS AT YOUTH OLYMPIC GAMES

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INTRODUCTION:
A decade ago the summer edition of the world-spanning under 18 yrs of age (u18) competition, the Youth Olympic Games (YOG) were introduced. In recent years there is a rising scientific interest regarding the nonlinear and highly variable developmental trajectory of performance in adolescent athletes due to the individual biological adaptations as a result of growth, maturation, training load & strain, and aging. Aim is to quantify age of peak performance (APP) and improvements over the preceding years of athletic career (AC) in former YOG athletics contestants in the complex movement and physically demanding triple jump (TJ) according to athlete performance level, sex, and age group.
METHODS:
Data were extracted from a renowned database (www.worldathletics.org) through 10/2021. Competition results of 29 female TJw & 31 male TJm qualifiers & medallists at YOG (2010, 2014) and their performance profiles of legally achieved outdoor season bests were empirically analysed. Comparisons of selected age groups & peers, AC duration and last performance, personal best (PB) and APP as well as participation & success at further champs were made.
RESULTS:
Contestants achieved YOG results of 85.7±3.0% (TJw) & 86.9±4.1% (TJm) relative to world's u18 best; meanwhile PB developed to 84.1±3.6% (TJw: 12.32-14.35m) & 86.8±5.1% (TJm: 13.97-17.18m) relative to actual world record. APP of YOG competitors is sig. lower (Kruskal-Wallis r=0.50-1.04) compared to peers & all-time best athletes ($X^2(4) = 81.65$ (TJw) & 40.04 (TJm), $p \leq 0.001$)), but not sig. different between sex. The average annual improvements were +1.5-6.3% in u18 followed by an increase rate levelling off at -2.0% to +2.0% in juniors (u20 & u23) to seniors (= mostly performance plateau or decline). The attrition rate until 2021 was 68% (22 TJw & 19 TJm). Of the remaining 32%, only 4 athletes achieved medal success in world junior champs, 5 athletes were contestants in senior world champs & Olympic Games so far.
CONCLUSION:
Accompanying the accumulation of adolescent competitions one observes a clear shift of APP to younger age (80-86% in u20) as well as shorter AC in YOG TJ contestants and therefore a need of a deeper knowledge on possibilities/limits of adaptation & training in adolescent TJ athletes. Jump performance in elite TJ is determined by the balance among velocity, force and movement technique which requires patience to continually adapt. Derived findings should provide further approaches on long-term, more holistic development pathways and strategic training planning (less is more; quality prior quantity) with enough attention on the biological domain (e.g. load & recovery, adaptation time, and enhanced vulnerability to injury/illness during biological maturation). Identification & documentation of qualitative factors (nature & nurture) should strengthen a viable, flexible, healthy & sustainable pathway from adolescent to senior TJ success.

Topic: **Statistics and Analyses**

Presentation **E-poster**