Sloan Sports Analytics Conference Application Sept 2025

Status: Waitlisted but did not get selected but was fun to work on the topic of diabetes and exercise/sports.

Analytics Opportunity: Exercise and Lifestyle Analytics for Metabolic Health Prevention

Sports analytics are often used to optimize elite athletic performance, but their potential benefits for everyday people—particularly those at risk for metabolic disorders—are vast. Conditions such as type 2 diabetes, prediabetes, overweight/obesity, polycystic ovary syndrome (PCOS), and gestational diabetes share an underlying link to insulin resistance and represent major global public health challenges. By 2045, it is projected that 783 million people will be living with diabetes (1). Individuals with PCOS or gestational diabetes face significantly increased risks of developing type 2 diabetes (2,3,4).

Evidence consistently demonstrates that regular physical activity, when paired with nutrition management, substantially reduces the risk and severity of these disorders (5,6,7). However, research also indicates that the optimal type, timing, and intensity of exercise—as well as dietary strategies—can vary considerably among individuals and conditions (5,8-10). Here, analytics have immense potential to transform broad public health guidelines into personalized, actionable regimens.

Proposal: Preventive Analytics Platform

I propose developing an analytics-driven health platform designed for individuals with, or at risk for, metabolic disorders such as diabetes, prediabetes, overweight/obesity, PCOS, and gestational diabetes. By integrating data from wearable fitness trackers, continuous glucose monitors (CGMs), and nutrition logging apps, the platform would:

1. **Analyze real-time and historical data:** Correlate workout type, duration, and intensity with blood glucose patterns and nutritional intake.
2. **Deliver personalized recommendations:** Offer tailored exercise guidance based on daily routines, menstrual cycles (for PCOS), pregnancy status (for gestational diabetes), and glucose variability.
3. **Provide actionable alerts and education:** Issue prompts such as reminders to eat before activity if glucose is low, or identify optimal times for exercise based on individual patterns.

4. **Visualize trends and progress:** Enable users and clinicians to track improvements in glycemic control, weight management, and insulin sensitivity over time.
5. **Incorporate gamification:** Motivate users through challenges, competitions, and milestone achievements, making exercise more engaging and sport-like.

Best Practice Alignment

This approach aligns with current clinical and digital health best practices, which center on data-driven, individualized prevention and care.

Conclusion

Leveraging analytics can bridge the gap between generic health advice and truly personalized prevention. For those at increased metabolic risk, this strategy empowers long-term behavior change and the reduction of future disease burden—demonstrating the powerful role that sports and exercise analytics can play in public health In addition to its clear metabolic and physiological advantages, regular exercise and participation in sports have profound effects on mental health and the sense of well-being in individuals, including those with or at risk for diabetes

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