

## Summary

This thesis addresses the acquisition of knowledge through a logical step by step process during the PhD course, highlighting five research activities with a main focus on sport and exercise psychology. The ultimate goal for research looked at exploring wearable devices and associated digital technology to deliver interventions aimed to increase exercise while measuring psychological variables such as stress. A foundation was initially set by a systematic review and meta-analysis on binary correlations between physical activity and key variables such as self-efficacy, self-regulation, and anxiety measured using validated questionnaires. A continued interest in exploring psychometric tools and their validation in sport drove the analysis of motivation scales and structural equation modelling in a cohort of Italian rugby players. With the beginning of the COVID-19 pandemic, however, community-based sports activities stopped, and the way in which exercise was performed and measured rapidly changed, as I highlighted in the report “Physical activity: Benefits and challenges during the COVID-19 pandemic”. In this unexpected scenario, government agencies as well as private entities and academic institutions applied digital technology to deliver health and wellbeing messages. The use of novel tools was beneficial while facing an increased sedentarism occurring during restrictions and lock-down periods. The study performed, involving office workers and electronically delivering exercise interventions in the form of active breaks, showed improvement in wellbeing and stress reduction. Finally, the last study presented can be viewed as a marker in time, as people return to normality, exercising and performing their normal routine but with a new emphasis in keeping track of their own health and wellbeing through wearable technology, following the change in measuring physical and psychological variables consolidated during the pandemic. The results met the intended goal to successfully provide a message-based, digitally delivered intervention aimed at increasing exercise and reducing stress, using wearables to measure the outcome. Moreover, the comparison of wearable-associated stress (based on physiological stimuli) with self-reported stress using a validated questionnaire (e.g., Perceived Stress Scale-10) showed a promising connection. I intend to continue in this direction to further explore benefits and limitations of digital technology in sport and exercise psychology.

A graphical abstract of the five research activities and related context is reported in the introduction.

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