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**'Compliance' versus 'adherence' in sport injury prevention: Why definition matters**

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## 'Compliance' versus 'adherence' in sport injury prevention: Why definition matters

For sport injury prevention efforts to be successful, athletes must adopt, and continue to use, preventive measures.[1] To this end, researchers have conceptualized intervention uptake as both a modifying factor in efficacy trials,[2] and as an outcome in effectiveness and implementation studies.[3] While this has advanced our understanding of effective intervention design, dose-response relationships, and barriers to program use, the definition of “uptake” has been inconsistent. Researchers often use “compliance” and “adherence” interchangeably, overlooking important differences in these constructs.[4] We propose that efficacy trials require “compliance”, but effectiveness studies do not; instead, they should measure and interpret “adherence” in real-life contexts. This distinction is an important first step for developing a framework to guide appropriate selection of outcome measures, measurement tools and analysis strategies to answer specific research questions.

“Compliance” refers to the act of an individual conforming to professional recommendations with regard to prescribed dosage, timing and frequency of an intervention.[6] This requires the measurement of behaviour relative to a fixed standard, and results must be interpreted with reference to deviations from this standard. This definition, however, implicitly assumes that study participants must “do as they are told”. [4-7] Researchers must therefore design interventions to fit the user’s context (without allowing users to adapt it if researchers get it wrong), or at least understand the context well enough to interpret findings when compliance is

below target. “Compliance” thereby addresses whether intervention components were performed as directed, but does not contribute to our understanding of the congruence between the prescription and the desired outcome, nor how behaviour change can be facilitated. [6]

“Adherence” is a process influenced by the environment,[5] recognizing that behaviour is shaped by social contexts as well as personal knowledge, motivations, skills and resources.[4,5] This definition acknowledges that the recommended intervention represents one of many possible actions, and the degree to which an individual chooses to pursue the suggested behaviour can be dynamic and situation-specific. Therefore, instead of framing results against a standard of “perfect uptake” (e.g. a difference score with maximum value of 100%), it is understood that individuals may use an intervention less than is recommended, more than is recommended, or any amount in between (e.g. a range with no upper limit). Interpretation of research findings must account for individual characteristics and other factors in the environment to explain within- or between-subject variability in behaviour, beyond simple comparison to a referent standard. Using an “adherence” approach thereby speaks to real-world intervention use, but does not allow for cause-effect relationships to be established between the intervention and injury outcomes.

To illustrate the significance of this issue in the broader medical literature, Vrijens and colleagues systematically reviewed the terminology used to quantify medication-taking behaviours.[5] In 146 studies they found more than 10 different words used to describe the outcome, with apparent trends in their use over time.[5]

Specifically, “compliance” was most commonly used until roughly 2002, at which point “adherence” became the preferred descriptor alongside a paradigm shift in the medical community that viewed the patient-physician relationship as one of cooperation rather than one of patient obedience.[5] The authors noted that heterogeneity in terminology resulted in an inability to directly compare findings between studies and challenges in applying evidence to practice due to inconsistencies in the outcome measures assumed to account for the behaviour in question.

Although the measurement of “uptake” is an evolving methodology, vocabulary choice and operationalization in research should relate to the type of study being undertaken. In efficacy trials, under controlled conditions with specific intervention prescriptions to compare against actual behaviour, “compliance” is appropriate. In practice, however, coaches and athletes have competing interests related to performance, health, team dynamics, sport culture, and a host of other contextual factors. In this sense, personal or institutional values and priorities will influence intervention uptake regardless of the research aims. Therefore, “adherence” should be the preferred construct in pragmatic trials, effectiveness studies and when considering implementation outside of research applications. [8]

Given the heterogeneity of implementation contexts for injury prevention programs[1] the generalizability of studies is difficult at best. The use of disparate intervention uptake definitions only compounds this problem by introducing inconsistent operationalized measures with different interpretations [e.g., proportion of sessions completed per protocol (compliance) versus total number of

exercises completed in a season (adherence)]. Consistency in language and proper interpretation with respect to the construct under investigation is therefore essential to the conceptualization of outcomes and the ability to translate research findings into meaningful practice. Measuring and valuing “compliance” in efficacy trials and “adherence” in effectiveness studies is a first step in reconciling current methods and reporting standards in injury prevention with the broader medical literature. It also pushes the field beyond simply observing intervention uptake to exploring the meaning of uptake in the broader context of injury outcomes, sport performance, and athlete health and wellbeing.

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