Inside the Black Box of Audit and Feedback: a Laboratory Study to Explore Determinants of Improvement Target Selection by Healthcare Professionals in Cardiac Rehabilitation

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Abstract
Audit and feedback (A&F) is widely used to aid healthcare professionals in improving clinical performance, but there is little understanding of the underlying mechanism that determines its effectiveness. The aim of this paper is to investigate the process by which healthcare professionals select indicators as improvement targets based on A&F. We performed a laboratory study among 41 healthcare professionals in the context of a web-based A&F intervention designed to improve the quality of cardiac rehabilitation care in the Netherlands. Feedback was provided on eighteen quality indicators, including a score and a colour (representing a recommendation for selection (red and yellow) or non-selection (green)). Indicators with more room for improvement were more likely to be selected, although this varied substantially between participants. In more than a quarter of the cases, participants did not select indicators with obvious room for improvement (yellow or red colour), or selected indicators without apparent room for improvement (green colour). We conclude that personal preferences and beliefs concerning quality and performance targets may dilute the efficiency of A&F.

Keywords:
Feedback, Psychological; Medical Audit/standards; Heart Diseases/rehabilitation.

Introduction
Healthcare organisations increasingly adopt audit and feedback (A&F) strategies to monitor and improve their quality of care. A&F provides healthcare professionals with an objective summary of their clinical performance over a specified period of time. Clinical performance is typically measured by a set of quality indicators derived from clinical guidelines or expert opinion—each indicator representing a quality aspect of care (e.g., proportion of patients receiving a treatment according to guideline recommendations, or mortality rates). Despite the widespread use of A&F and the inherent efforts and costs put into their development and application, A&F interventions show variable effectiveness on improving quality of care. A recent Cochrane review of 140 randomised trials of A&F interventions reported a median 4.3% absolute improvement (interquartile range 0.5% to 16%) in quality of care, with a quarter of the studies showing a strong positive effect, but with another quarter showing a negative or null effect. Previous studies have attributed much of the observed variability in effect of A&F interventions to feedback design characteristics and contextual factors. They suggested A&F to be most effective if provided by a supervisor or colleague, more than once, both verbally and in writing, if baseline performance is low, and if it includes explicit targets and an action plan. Other suggested effect modifiers are the perceived quality of the data underlying the feedback, motivation and interest of the recipient, organisational support for quality improvement (QI), and how performance targets or benchmarks are derived. However, whereas these studies contribute to our knowledge about what factors may influence the impact of feedback, they do not help us understand the underlying mechanisms of how A&F interventions affect the quality of healthcare. Little progress has been made on this matter because most randomised controlled trials (RCTs) on A&F interventions did not explicitly build on previous research or extant theory. Instead, they treated the intervention as a ‘black box’, focusing solely on outcomes (i.e., a change in quality of care) while ignoring the mechanism inside.

Control Theory is an increasingly recognised theory in A&F literature that offers an explanation of how this feedback mechanism works. It starts from the assumption that healthcare professionals are prompted to improve practice when observing a discrepancy between their own performance and a certain target (e.g., peer performance). Feedback reports will continue to prompt improvement actions until the discrepancy has been solved, i.e., denoting target achievement. However, if professionals disagree with the target or observe a discrepancy that is too great, or professionals lack skills, motivation or resources for action, they may decide against selecting particular indicators as targets for improvement. Hereewith, Control Theory reveals two steps in the feedback mechanism essential to improving upon indicators: (i) healthcare professionals must recognise achievable room for improvement on indicators before selecting them as QI targets, and (ii) they must formulate and perform effective improvement actions. Understanding how these steps work is imperative for designing successful A&F interventions; in this paper we investigate the first step.

The aims of this study were thus to determine (i) how healthcare professionals select quality indicators as targets for improvement based on reports of performance feedback, and (ii) what are reasons to disregard feedback’s recommendations for selecting indicators. The study was conducted in a laboratory setting among cardiac rehabilitation professionals.