

The Missing Piece in Clinical Assessment: Interdependence and Team Performance

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Clinical care is a team effort, and teamwork is crucial for providing effective and efficient patient care. The performance of medical students or clinical trainees is not only based on their individual competencies but also on the team they work with and the supervision they receive, making it interdependent, not just based on individual traits or competencies. Interdependence refers to the pattern of interactions between individuals in a collaborative setting, which can either facilitate or hinder their performance and impact the overall practice of the healthcare team (Almoghira, 2021). Interdependence in clinical work can manifest in various forms, ranging from cooperative (positive) to competitive (negative), or even individualistic efforts (none) (Mulisa, F., and Kassahun Mekonnen, 2019). This can occur at both individual and systemic levels. For example, at the individual level, interdependence may take the form of collaboration between trainees or different members of a healthcare team, or supervision between a supervisor and trainee (Almoghira, 2021). Systemic interdependence of clinical trainees, on the other hand, may involve interactions with medical guidelines, technology, or organizational systems (Sebok and Syer, S. S., 2020).

Despite the collaborative nature of clinical care, the evaluation of clinical performance remains largely centered on individual performance, ignoring the significance of systems, teams, and relationships. The conventional assessment models are designed to evaluate individual performance, making it challenging to accurately assess the collective aspect of clinical performance in a workplace-based training environment.

Medical education has evolved from teaching trainees to work independently to teaching them to work without direct supervision in collaboration with others. Despite this shift, the assessment process has yet to reflect this change and continues to focus on individual independence. This creates a significant conceptual discrepancy between the collaborative nature of clinical care and the individualized approach to the performance assessment, which hinders individuals from

receiving comprehensive assessments that accurately reflect their contribution to delivering effective collaborative healthcare (Chahine, S et al., 2018). Overcoming this discrepancy is crucial to ensuring that performance evaluations truly reflect the nature of clinical care delivery.

In academic literature, there is a lack of refinement in the measurement of interdependence, with multiple concepts and terminologies that are used to describe it. Scholars from multiple fields are working separately to address the issue, and terminological difficulties may explain the slow evolution of measurement models for interdependence. Literature identifies both descriptive/ exploratory and inferential/ predictive approaches to measuring interdependence (SebokSyer et al., 2021), but these approaches are diverse and only loosely related to healthcare assessment. Some recurring concepts along with their possible application to clinical context include:

1. Dyad measurement methods

Dyad measurement methods can be used to develop models for supervisor-resident interdependence. For example, by determining the clinical outcome attributed to the resident, separate from the supervisor's input. This approach may have limitations, such as the limited ability to repeat unique pairings. However, having an outcome that can be clearly defined and measured (time and efficiency) would be beneficial.

2. Social network mapping

Social network mapping can be used to visualize interdependence among individuals participating in a specific clinical activity by showing the strongest connections. However, this approach assumes equal contribution from , which may not always be the case in medical training. But it can be effective with smaller sample sizes, such as in postgraduate programs.

3. Data mining and machine learning

For data mining and machine learning, existing databases such as the Electronic Health Record (EHR) can be analyzed using clicks. However, this approach requires a computerized data environment and may pose challenges in translating online learning data to the clinical setting.

In addition to these measurement models, it is important to

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emphasize the value of incorporating qualitative methods to capture the complexities within healthcare teams that cannot be quantified. Research that combines multiple measures may be of most use.

To advance interdependence research, it is crucial to determine which clinical actions and decisions are interdependent. For instance, laparoscopic surgery where one member uses the surgical instrument tool, and another the camera. This will deepen our understanding of interdependence specifically in healthcare context. Moving forward, assessments should reflect the trainee's contribution to the healthcare team's overall performance, rather than just their individual score. This means shifting away from a single score-focused evaluation to assessments that capture individual and interdependent aspects of performance.

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