Implementing Innovations in Health Care Settings: Example of the Surgical Safety Checklist

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Abstract

Innovation — a new idea, practice, or object — is necessary if we want to provide an adequate answer to the ever-increasing complexity of care. Although many of these innovations demonstrate promising results within the study context, health care providers and the public, are increasingly aware promising research results do not easily translate into improved daily health care practice. The fact is that about 70% of all change initiatives fail. This proceeding paper provides a narrative overview of the most important frameworks regarding the implementation of innovations in health care settings. Surgical safety checklists are used as an example to illustrate the concepts related to implementation. As the existing knowledge is not conclusive and does not provide clear solutions for the implementation problem, it is difficult to make solid recommendations. Instead we — based on existing frameworks and complex adaptive systems theory — provide a assumption to foster future research.

Keyword(s): implementation; change management; innovation; patient safety; checklists

1. INTRODUCTION

"An innovation is an idea, practice, or object that is perceived as new by an individual or other unit of adoption. It matters little, so far as human behavior is concerned, whether or not an idea is “objectively” new as measured by the lapse of time since it first use or discovery.¹¹"

Innovation — a new idea, practice, or object — is indispensable if we want to provide an adequate answer to the ever-changing demands of health care. Besides, innovations themself could alter the context of existing, already answered, questions; requiring the problem and/or its solution to be redirected. The changing context and needs in healthcare, and concomitant complexity, require the development of new technologies, materials, and devices. But also call for new organizational, processes, models and modes of healthcare delivery. The adoption of innovations should be based on evidence, derived from rigorous scientific research. The latter to ensure that the application will lead to improved clinical and health economic outcomes (i.e. without causing additional harm or costs lower than the existing standard of practice). From that perspective healthcare innovation and quality of healthcare must be tightly connected.

Although many innovations — aimed at improving healthcare, human health or well-being — demonstrate promising results within the study context, health care providers and the public, become increasingly aware that these results are not easily transferable into daily health care practice. To frequently, initiatives trying to implement innovations into health care settings result in limited changes for the better or no meaningful changes at all, and the few that are successful are often hard to sustain or replicate in other contexts.²
The implementation of innovations has shown to be difficult in various health care settings. In fact, estimations indicate that about 70% of organizations’ efforts to implement change fail. The mere availability of innovations does not guarantee improved outcomes; the innovation must become part of daily practice. To achieve the added value of the innovation, it is of key importance that the innovation will be used as intended, emphasizing the importance of the implementation process.

For the purpose of illustration, surgical safety checklists are chosen as a depiction of a health care innovation. The effectiveness of surgical safety checklists is supported by a solid body of research, demonstrating that the correct usage of this tool can significantly reduce the risk for postoperative complications, including mortality. However, studies using “real life” administrative health data have failed to show improvement.

2. WHY DO INNOVATIONS FAIL IN REAL LIFE?

The cause of failing to obtain improvement in real life settings can be attributed to the innovation itself (i.e. the innovation does not work), or can be attributed to the implementation process (i.e. the innovation is proven to be effective, but is not implemented or used as intended). In order to make a distinction in the cause of failure — ineffective innovation vs. failing implementation — we must ensure the innovation is implemented as intended.

Systematic evaluation of implementation fidelity — the degree to which innovations are implemented and used as intended by the innovation developers — is often difficult, particularly for complex interventions. Therefore, indicators are often used instead; which measure adherence to certain aspects of the innovation or its administrative reflections. Furthermore, the lack of theoretical and practical guidance is regarded as a strong barrier to evaluating implementation fidelity.

Referring to the example of surgical safety checklists, the above-mentioned methodological difficulties are clearly illustrated. The implementation of checklists is more than checking off boxes; it is essentially a complex social intervention with an expectation of interaction and cooperation between surgeons, anesthesiologists, and nurses. Teamwork is not easy to measure, as such, not easily quantified. Ideally, it requires clandestine observation (by video or observer). Therefore, measuring implementation fidelity is often reduced to solely checking whether or not checklist items are ticked. It has, however, been demonstrated that a discrepancy exists between checking boxes and preforming the action it calls for.

Notwithstanding these difficulties, measuring implementation fidelity is important. It does not only reveals if the failure can be attributed to the innovation or the implementation; if done in detail, it provides insight into the parts or elements of the innovation that we struggle with to implement.

3. WHY DO IMPLEMENTATION EFFORTS FAIL

Many theories and frameworks have been published to help promote effective implementation of innovations in health care. Some have focused on implementing interventions (including those termed interventions, programs, innovations, complex interventions/innovations, shared-decision making, technologies, evidence-based practices, and telehealth), guidelines (including clinical-practice, best-practice, and evidence-based guidelines), knowledge, evidence-based practice model, and packaged implementation programs for innovations.

However, they overlap considerably in the constructs included in individual theories, and a comparison of theories reveals that each is missing important constructs included in other
theories.[29] In addition, terminology and definitions are not consistent across theories.[30] Attempts have been made to define a standard glossary,[31] to consolidate existing frameworks,[29,32] and even to propose a general theory of implementation.[32]

3.1. Factors affecting the implementation process

Based on the existing frameworks, variables that may affect the implementation process — also termed facilitators and barriers or determinants of practice — were grouped in five domains.[29,30,33] (a) Innovation domain: A grouping of related influencing factors regarding the characteristics of the innovation to be implemented. (b) The context domain: Grouping of related influencing factors regarding the circumstances that surround the innovation to be implemented. (c) Individuals: Characteristics and agency of the people involved with the innovation and/or implementation process. (d) Organization: Conditions and characteristics of the setting(s) in which the innovation is to operate. (e) Local environment: Circumstances immediately surrounding the organization(s) including the community, patients and network. (f) External system: Broad economic, political and professional environment.

Concerning the implementation of surgical safety checklists; several studies suggest that the implementation process is impeded or advanced by aspects within four major domains: organizational factors, systems factors, team factors, and tool-specific factors. Organizational barriers include the implementation approach and lack of culture for change. Facilitating organizational factors include education/training, feedback on local data, accountability for non-compliance, and support from hospital management. System factors like time wasting and repetition, failing to add anything to the system are considered as barriers. While integration with existing paperwork/processes to streamline and remove repetition are considered as facilitating factors. Resistance and non-compliance form certain individuals within the team make it very difficult to complete the checklist without confrontation, or certain individuals are not engaged in the checks. On the contrary, senior clinicians (surgeons and anesthesiologists) buy-in, strong individual leadership skills and passionate leaders stimulate participation from the rest of the team. Likewise, involving all team members in the implementation and modification of the checklist improves uptake. Tool-specific, design problems — the content and/or structure of the checklist is inappropriate, irrelevant and/or illogical — the fact that the checklist is not suitable for use in certain specialties and/or certain types of procedure (i.e. emergencies, day-case) —, unsuitable timing of checks, unintended negative effects, concerns regarding patient perceptions, and skepticism regarding the evidence base hamper the implementation process. Where, ownership and effective use of the checklist are improved by customization of the layout and/or content to the specific surgical context facilitate the implementation process.

However, the complex reality in which the surgical safety checklists must be implemented requires an approach that includes more than getting rid of the barriers and supporting facilitating factors. The complex interplay between the barriers, facilitators and involved individuals is of equal importance.

3.2. Complex adaptive systems

Health care, as many other systems, is characterized as complex adaptive systems. Within this framework, organizations are characterized as living entities or organisms existing within a complex ecosystem. In any ecosystem, individual agents are independent and have their own identity, yet coexist and are dependent on each other for the maintenance of the whole system and therefore their survival. The living entities interact with the environment and are affected by it, creating a balance of interdependent elements. The complex set of relationships existing
between these various elements of an ecosystem is often described as a web. These living systems are not fixed but rather change, grow, repair, adapt, reproduce and slowly evolve.

Although no real consensus exists on the set of characteristics that define a complex adaptive system, the following set of five key characteristics captures the major concepts from the literature: (a) diverse agents that learn, (b) nonlinear interdependencies, (c) self-organization, (d) emergence, and (e) coevolution. We are not attempting in this chapter to give a deep review of complexity science or complex adaptive systems theory.

Many of the difficulties of securing improvement lie in the enormous complexity of healthcare delivery systems, including their challenging technical, social, institutional, and political contexts. Health care organizations have diverse agents that learn including providers, patients, and other stakeholders. Diversity is often a source of creativity and problem-solving ability but can also be a source of communication difficulties. Learning is not one-dimensional, focusing on uncertainty reduction, but it also incorporates learning aimed at uncertainty absorption. Relationships among agents are usually nonlinear. Outputs may be disproportional to inputs; small inputs can produce large outcomes; and large inputs can produce small outcomes.

When people seek to implement an innovation, they express their agency (i.e., their ability to make things happen through their own actions). This is expressed in interaction with other agents, other processes, and contexts. Professional groups can facilitate as their focus and orientation are guiding for professional behavior and therefore also for change. Agents seek to make these processes and contexts plastic: for to do one thing may involve changing many others. Implementation therefore needs to be understood from the outset as a process – that is, as a continuous and interactive accomplishment – rather than as a final outcome. Moreover, ‘implementation’ never refers to a single ‘thing’ that is to be implemented. Whenever some new way of thinking, acting, or organizing is introduced into a social system of any kind, it is formed as a complex bundle – or better, an ‘ensemble’ – of material and cognitive practices. Even what appear as very simple implementation processes involve many moving parts.

4. Final thoughts

Implementation of innovations in health care settings is complex. Despite the availability of various frameworks and theories, current insights do not allow specifying one single solution. Complex adaptive systems theory suggests that an implementation process involves many, unpredictable, interactions within a hierarchical social system. Therefore, we conclude not with broadly applicable recommendations. Instead, we want to stimulate the search for solutions by proposing an assumptions arising from the above-mentioned theories and ideas: “People don’t change; they evolve while adapting to changing circumstances.” This assumption implies that implementation programs must not aim to changing individuals; instead it must create a context supporting individual and team evolution while adapting to the changes needed for the innovation to become part of daily routine.

REFERENCES


