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Exploring Lean Healthcare Transformation using The Theory of Planned Behavior

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Abstract

The literature suggests that lean transformation efforts in manufacturing and healthcare industries fail approximately in 90% of applications. As such, it is critical to understand how lean implementation efforts affect human behavior. In this research study, the physician author was embedded in an academic specialty out-patient department for 12 months providing training on lean methodology to supervisors and staff, and facilitating Kaizen events. Direct observations, informal interviews and journal notes were kept to capture event outcomes, change in behaviors, and staff comments following the events. The behaviors were examined using the Theory of Planned Behavior. Data analysis suggests that supervisors and staff rapidly grasped the knowledge about lean tools for improving processes and creating new services, yet failed at committing to lean thinking and taking responsibility for implemented improvements. Through an understanding of subjective norms, perceived behavioral control and attitudes, the author offers insights into successes and failures of lean efforts at behavioral change in healthcare.

Key Words: lean healthcare, Theory of Planned Behavior, organizational change management

1. Introduction

Adoption of lean methodology by healthcare institutions has been spreading throughout the United States and the British National Health Service. Enthusiasm for its promises of reduced costs and improved quality have come from reports of impressive, initial successes, but reports of long term results are more scarce [1]. Estimates of failed achievements in manufacturing run as high as 90% [2]. Companies and hospitals revert to old habits and management styles without successfully making the transformation to a lean culture. Understanding determinants of behavior provides some explanation for these limited results and points to strategies for improving compliance with change. The Theory of Planned Behavior (TPB) described by Ajzen [3] provides a framework for discussion of the components necessary for cultural change in the adoption of lean in healthcare. The goal of this research is to offer strategies for improving the success of lean efforts in healthcare.

2. Theory of Planned Behavior

To be human is to be able to consciously anticipate the outcomes of one's behavior and to act with self-control as opposed to passively reacting to neuronal or environmental stimuli [4]. Humans have agency to act, which means the power, the conscious intention, the freedom to choose, and the ability to be reflective about the consequences of their actions [5].

Ajzen proposed in the TPB (see Figure 1) that people behave according to the intentions that they develop from the interplay of their "perceived behavioral control", their "attitudes toward the behavior" and "subjective norms". Perceived behavioral control pertains not only to one's internal beliefs that the goal can be achieved and that one has the requisite skills and knowledge to complete the task but also includes external beliefs regarding such factors as time, cooperation of others, and tools to accomplish the goal. Favorable or unfavorable attitudes towards a behavior develop from conscious self-reflection about the consequences from the behavior. Subjective norms are the product

of normative beliefs about the likely approval or disapproval of referent groups such as co-workers, friends, superiors, or other social groups [3].

The TPB has been used for 20 years by researchers to explain why people in general and healthcare professionals specifically adopt or fail to adopt new behaviors. The majority of the applications of the theory in health and healthcare have been to predict the adoption of new behaviors such as clinical guidelines and recommended personal health behaviors such as diet and exercise [6, 7]. TPB has been used to analyze the intentions of anesthesiologists to violate clinical guidelines for pre-surgical and intra-operative procedures [8, 9]. It was found that the most influential factors were subjective norms (what their peers would think), attitudes (does the guideline really matter?), and habits (I haven't done it that way). Its validity for predicting behavior has been confirmed by meta-analyses of its use in multiple environments in which perceived behavioral control and attitudes toward the behavior were highly predictive of behavior [7, 10-11].

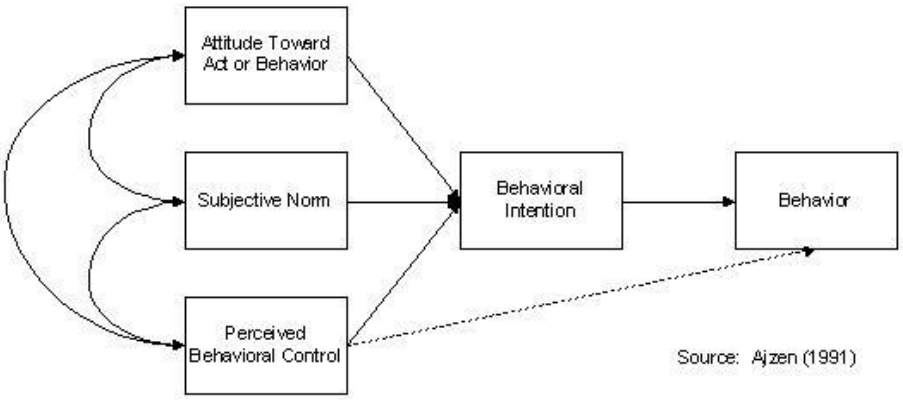

Figure. 1: Theory of Planned Behavior

3. Research Method

In evaluating behaviors of participants in an improvement initiative such as lean, it is important to use both quantitative and qualitative methods. The quantitative portion for this research comes from a survey of employees' satisfaction about lean work and assessment of processes flow improvements. Qualitative data was collected using direct observation, and interviews with employees. For one year, the first author of this paper, an experienced physician engaged in continuous quality improvement work in the healthcare industry, was embedded in an outpatient clinic of an academic medical center with the charge to improve patient flow and staff satisfaction using lean methodology. To identify problems with patient flow, over three days a number of interviews and observations with physicians, nurses and patients were conducted. The collected data also included Value Stream Maps (VSMs), time studies and spaghetti diagrams of nurses and several physicians. The investigator then spent three additional observation days with the employees to learn about scheduling procedures and current issues with delays. The investigator also asked questions of the nursing staff, technicians, residents, physician assistants, and several physicians about their impressions of why patients were delayed, what they found frustrating about their jobs, what they wanted changed, and how hopeful they were that it could be different. Mandatory introductory classes about lean methodology and philosophy were held for all faculty, residents and staff.

During the implementation phase, several 1-2 day Kaizens were held to address communication failures and patient flow, to examine nursing roles and work delays, and to improve follow-up scheduling of tests and clinic appointments. "Stop the line" methods were instituted that brought the clinic manager, vice chairman and nursing manager to the front desk to investigate any patient found to have been "lost" in the electronic tracking system. A large central white board supported by a flag system was installed for flow coordination and communication throughout the department. Also, a new unit coordinator was hired to manage patient tracking. The Kaizen team created new intake forms to replace free form interviews. A single lab and imaging requisition replaced folders of forms. Finally, a more reliable and comprehensive daily physician schedule was created and placed into templates without overrides. As such, over three months, four new physicians were worked into the clinic schedule and new policies were established for vacations, away days and call schedules.

Throughout the implementation, notes were recorded into the investigator's' personal journals and discussed by the research team for correctness and sound judgment. Through the Kaizen events and other interactions with hospital employees and leadership, approximately 450 hours of direct observations and interviews were conducted.

The data collected was analyzed using abductive inference to understand an observed phenomenon [12,13]. In general, abductive inference starts with a set of facts derived from a review of the literature. It then attempts to make sense of a situation by providing the most likely explanation of what was observed, in this case, using TPB as filter for analysis. This analysis is appropriate for this research because the observed events and behaviors create an opportunity to make an attempt to find possible guidelines for effective and efficient lean implementation efforts in healthcare industry.

4. Results

Patients frequently needed to wait over 2 hours prior to receiving services. Many patients often gave up and went home with rescheduled appointments for another day. "Emergencies" appeared to be the norm. Physicians functioned with a schedule that lacked 5-25 known and expected patients per physician that needed to be "worked in" to the schedule daily. Department meetings and conferences overlapped with clinical hours. One physician came to the clinic hours after the first patient had arrived.

A new electronic medical record (EMR) and office management package had eliminated the visual cue of the paper chart previously used to track patients. Nurses, functioning without standard work policies were blamed for long patient delays, Nurses complained about overwork, constant interruptions, physicians ignoring pages, having to manage phones and never having enough time, making them quite unhappy and motivated to leave. Receptionists were angry at having to make excuses to waiting patients while they also blamed patients for not arriving on time. Almost universally, staff and physicians believed nothing could be done to make their work easier. They had come to accept their work as hopelessly complicated, emergent, and filled with uncertainties that required their flexibility, tolerance and forbearance. They had developed a perverse pride in surviving their days but their demeanor was depressed.

Lean work in the department rapidly reduced patient waiting time by 27%. Nursing time to prepare new patients fell from 28 to 9 minutes, interruptions of physicians were cut in half, and initially, "lost" patients in the waiting room queue were lowered by 85%. Use of the white board was assured by the unit coordinator. Initial compliance with the exam room flag system was poor until nurse and physician champions convinced others of its utility. The "stop the line" effort that required any staff member to report a "lost" patient fell off after a receptionist was terminated for unrelated reasons but was assumed to have been fired because of reported mistakes. Though the staff had agreed in the Kaizens to standard work for communications and documentation using the EMR, they rapidly reverted to previous habits.

In response to a survey, 83% of staff expressed satisfaction with the results but wanted to focus attention on multiple other areas that they felt were broken. The staff and some providers actually became more agitated, frustrated and intolerant of clinic delays, mistakes and waste. Early success with these lean projects led unexpectedly to the opening of a deep reservoir of stress, low morale, and previously unspoken complaints and frustrations. It was as if, by introducing the possibility of improvement and highlighting the wastes, the early lean work had reconfirmed their beliefs that nothing works, delays were expected and there was no reliability. They challenged lean efforts by saying "Yes, but what about this problem!"

Examining the behaviors throughout the project using TPB we learned that the highest compliance came from lean changes that required the least development of intention from the interplay of their perceived behavioral control, their attitudes toward the behavior and subjective norms. For example, installation of the white board was controlled and managed by the new unit coordinator and was not dependent on attitudes or social acceptance. Deviance and non-compliance with proposed lean improvements increased where development of intention was required. For example, the exam room flag system was dependent on training and convincing all staff and physicians that it was meaningful and an expected routine in the clinic. Low perceived behavioral control on the part of nursing staff and receptionists lowered their compliance with new procedures for documentation and communication. They commented, "I don't know if I can use that function in the electronic medical record." Thus they resisted the agreed upon lean improvement until sufficient training, practice, and confidence had been provided.

Negative attitudes toward the behaviors created resistance and were often expressed in comments like: "This stop the line could get a person fired," "I don't trust the nurses to read the comments," "Talking by phone is more personal" and "These flags are silly." Conflicting subjective norms in the department reduced compliance with work standards developed by lean efforts demonstrated by comments such as, "Attending departmental conferences is more important than being on time for patient visits," "No one uses these flags," " I don't want to be the only one calling stop the line." Successful adoption of the lean behaviors appeared to negatively correlate with the degree to which the behavior was dependent on Ajzen's three determinants of intention. Table 1 demonstrates the compliance with lean changes as analyzed via TPB.

Table 1: Compliance with lean changes seems correlated with its reliance on behavioral determinants

Lean Improvement	Perceived Behavior Control	Attitudes toward the Behavior	Subjective Norms	General Compliance
White board	Low	Low	Low	High
Intake Forms	Low	Medium	Low	High
Lab Requisitions	Low	Low	Low	High
Appointment Template	Low	Medium	Low	High
Communication in EMR	High	High	High	Low
Stop the Line for lost pts	Low	High	High	Low
Exam room Flag System	Medium	High	High	Low

Our research demonstrates that, unfortunately, many lean improvements did not achieve the desired behavior change. The next section of this paper provides discussion and recommendation for leadership teams to avoid such pitfalls during lean implementation efforts.

5. Discussion and Recommendations

The implications for successful lean implementation in healthcare are that countermeasures that reduce reliance on behavioral intention will be most easily adopted. Behaviors that require the development of intention, however, will require a deeper exploration of individuals' perceived behavioral control and attitudes and the subjective norms of the healthcare environment within which change is expected.

Healthcare institutions in general are plagued by attitudes, social norms, and cultural beliefs of low-expectations [14]. Lean is an effective means to create change when there is a thorough and comprehensive use of philosophy, methods, tools, managerial monitoring and audits, and disciplined application of consequences for non-compliance. There are no short cuts. Failure to achieve expected results from lean efforts may be linked to insufficient attention to the underlying factors that create intentions for behavior.

In healthcare organizations, if perceived behavioral control is low, staff must be allowed to express their reservations and be given every opportunity for training, practice, review, and building of confidence in their ability to perform the new functions without fear of appearing slow or inept. If after trying new procedures, they run into external barriers of time, equipment, or team cooperation, they need to know management is eager and ready to explore the issues and remove those barriers.

Negative attitudes towards the changes mean staff or physicians do not believe the changes will work. Their skepticism can be disarmed by enthusiastic approaches to incremental improvement based on Plan-Do-Check-Act (PDCA) cycles that use testing and determination of the actual positive and negative consequences of the proposed changes. Staff and physicians can be assured that what doesn't work gets modified. Trust and positive attitudes develop with subsequent iterations. Staff members who become experimenters and problem solvers strive for long-term resolutions instead of short-term work-arounds and are reinforced by their successes [15].

If there are cultural norms of low expectations such as late physician arrival times, unreliable communications or poor adherence to standards, more intentional and repetitive efforts are needed to expose those lax cultural norms, build the case for change by demonstrating the harm, enlist all stakeholders and hold everyone accountable with appropriate consequences for non-compliance. If there are no consequences of non-compliance, individuals are unlikely to develop the desired intentions and behaviors. This requires extensive monitoring and measuring of compliance, consistent application of rules and standards and the courage of leadership to discipline when necessary.

This has been discussed by Furman and Caplan [16] in their description of the Virginia Mason Medical Center patient safety alert system that in 5 years led to the identification, counseling and eventual suspension of over 50 staff and physicians for unsafe behavior. Executive leadership must demonstrate its willingness to apply the rules equally, fairly and consistently to be taken seriously and change the subjective norms that drive the desired behaviors [17].

6. Limitations

The following limitations are identified. First, this study was conducted only in one organizational setting. Second, data collection by investigator presented several difficulties: 1) direct observations can alter responses and behavior (also known as Hawthorne effect); and 2) the unknown bias of the researchers, which could influence what was recorded, coded and analyzed, could be present in this research. Due to the limitations this research provides only a set of recommendations and not explicit solutions to identified problems. Future research using longitudinal design could be used to further investigate the possibility of applying concepts of TPB for measuring lean implementation projects. Therefore, based on the limitations of this study, generalization of the findings to the entire population of healthcare professionals cannot be ascertained.

7. Conclusions

The Theory of Planned Behavior has been applied to explain the successes and failures of behavioral change in the setting of a specialty outpatient clinic attempting to use lean methods. While the conclusion is drawn that if intention toward the behavior is required, attention must be given to individuals' underlying perceived behavioral control, attitudes toward the behavior and subjective norms, further research is necessary for validation. It is hoped that this will lead to the fulfillment of the potential for lean applications in healthcare improvement.

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