Visualizing improvements of care processes- supporting engagement and perceived systems performance in improvement work

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1. Introduction

International and Swedish research shows that visualizing tools are frequently used when implementing improvements and organizing health care according to Lean. This is in line with the original industrial concept lean production, where visualizing aim to uncover and eliminate different kinds of waste, to support learning from mistakes and to provide the coworkers with a common understanding of the production. Visualizing tools (VT) used in health care are often in the form of whiteboards, in different styles and sizes showing patient flow, efficiency or improvement work at a specific unit or ward. By such visualizing, staff may get a shared understanding of the work process, which in turn encourages all health care professionals to collaborate and engage in improvement processes. Engagement and collaboration among staff can be considered as vital when it comes to systems performance and interactions between the system components Human-Technology-Organization (HTO). The aim of this paper is to contribute to the understanding of to what extent visualizing tools (VT) intended to support improvements of care processes, affect staffs' perceptions of support in improvement work, their engagement and collaboration, and how it affects the perceived systems performance in the health care setting.

2. Method

Three hospitals with various degrees of lean implementation over the last two-three years were studied. A short lean-index questionnaire (LIQ) was distributed to unit managers (UM) at 13 units (essentially emergency, surgical, medical and intensive care). The LIQ included ratings concerning to what degree (1-5 were 1 = not at all and 5 = to a very high degree) daily work was influenced by the visualization of improvement work (VIW). Further, a questionnaire was distributed at the 13 units' assistant nurses and registered nurses (N = 541). Questions concerned the perception of use of and support from VT, improvement suggestions, collaboration at unit, satisfaction regarding quality of care, efficiency and work environment. Answers from units where UM had rated high influence by VIW (table 1 alt. 5=HI), was compared to answers from units where UM had rated low influence of VIW (table 1 alt. 1-2=LO). Quantitative analysis shows descriptive statistics and significance level (% and Chi-square) of the 4 HI and 5 LO units. See table 1.

Table 1. N, response rate and rated influence of visualization of improvement work.

Unit	A	B	C	D	E	F	G	H	I
N	32	31	52	26	33	29	70	26	34
Response rate (%)	69	94	56	58	73	66	69	77	44
Rated VIW	HI	HI	HI	HI	LO	LO	LO	LO	LO

3. Results

The results show a difference between groups in use and frequency of use of visualizing tools, thus use is fairly high even by staff at LO units (table 2). This could imply that other kinds of visualizing tools were used at the units, or that UM had underestimated the influence of VIW. HI units were to a greater extent supported by the visualizing tool in overlooking work but not in viewing improvement opportunities nor by increasing the number of improvement suggestions. There was however a difference in how a greater part of staff at HI units had their improvement suggestions discussed. A greater part of HI unit staff perceived collaboration to work "very well" within own profession, as well as they were "very satisfied" with the efficiency and work environment at their own unit.

Table 2. HI/LO units grouped together and compared regarding questionnaire results.

	HI	LO	Sign. X^2
1) Staffs' use of any visualizing tools	(n=91)	(n=114)	p=0.005*
(3-graded scale, responses alt 1) *YES*	93%	80%	
2) If *YES* on question 1, staffs' use of visualizing tools	(n=51)	(n=54)	p<0.001*
(6-graded scale, responses alt 1-4) *Several times a day - Weekly*	88%	50%	
If *YES* on question 1, support to:			
3) - overlook work?	(n=50)	(n=53)	p=0.001*
(5-graded scale, responses alt 1-2) *Very high - high degree*	68%	32%	
4) - view improvement opportunities?	(n=51)	(n=53)	p=0.082
(5-graded scale, responses alt 1-2) *Very high - high degree*	49%	28%	
5) Number of own suggested improvements per year	(n=90)	(n=114)	p=0.276
(5-graded scale, responses alt 3-5) *4 - More than 10 suggestions*	30%	25%	
6) Number of own suggested improvements per year being discussed	(n=89)	(n=109)	p=0.006*
(5-graded scale, responses alt 2-5) *1 - More than 10 suggestions*	83%	61%	
7) Collaboration within profession at unit concerning improvement work	(n=91)	(n=116)	p=0.018*
(5-graded scale, responses alt 4) *Very well*	32%	14%	
8) Perceived efficiency at own unit	(n=89)	(n=113)	p=0.022*
(4-graded scale, responses alt 4) *Very satisfied*	18%	10%	
9) Perceived working environment at own unit	(n=89)	(n=114)	p=0.001*
(4-graded scale, responses alt 4) *Very satisfied*	17%	10%	

4. Conclusion

Results show that high influence of VIW at a unit was related to unit staffs' perception of increased engagement and collaboration concerning improvements, as well as systems performance represented by question 8 and 9 in table 2.