Enhancing Qualitative Improvement Culture Assessment Tools Using Statistical Methods

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Context

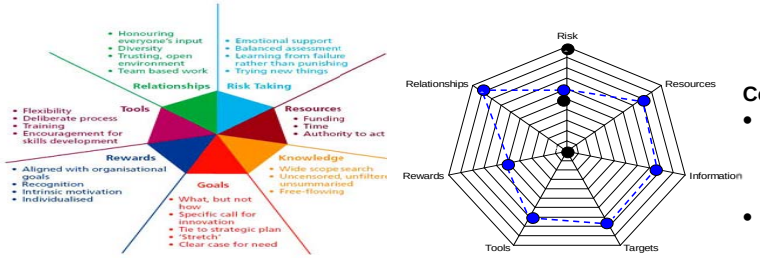
- Hamad Medical Corporation (HMC) is the only provider of public tertiary healthcare services in the Sate of Qatar. The corporation manages eight hospitals and employs more than 20,000 clinical and non-clinical staff from more than 60 nationalities, leading to significant diversity.

Problem

- Increasingly, healthcare organizations are becoming aware of the importance of transforming organizational culture to improve quality and patient safety.
- An assessment of staff thoughts, feelings and attitudes towards quality and safety was necessary in order to establish a baseline from which to measure the development of a positive culture for improvement and the impact of HMC wide quality improvement strategies.
- The review of opinion -based data often leads to what is considered soft data. Although rich, this data is generally considered less reliable or quantitative and so is frequently not acted upon in the same way as numerical measures and indicators. It is important to try to draw meaningful and easily accepted conclusions and recommendations from culture change work if programs are to be effective.

Assessment

- A self-assessment tool developed by Bevan, Mayer and Plesk* (2005) was selected and applied across HMC hospitals. . The tool considered scoring criteria against seven areas thought to be significant to establishing an improvement culture in an organization (as shown below).
- The tool can be applied via workshops, is interactive, debates best practice and hence supports both good understanding and staff engagement. The recommended approach to presenting the data is a radar/portal diagram as shown below:



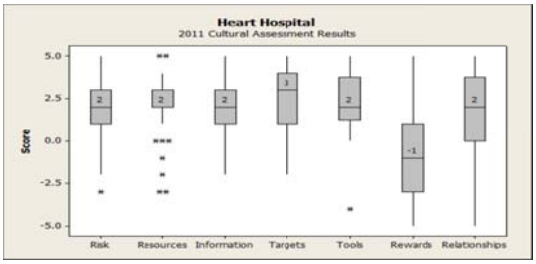
The original assessment tool suggests displaying results through radar charts, which give a good visual overview and can be compared overtime. However, this approach has several limitations:

- the results displayed represent the median value for each dimension and do not allow review of the full range of scores, so limiting analysis
- There is no singular quantitative measure integrating all 7 dimensions scores.
- There is no singular numerical score to each hospital regarding consensus allows us to review the degree to which participants agree about the dimensions.

Results

Visual Presentation

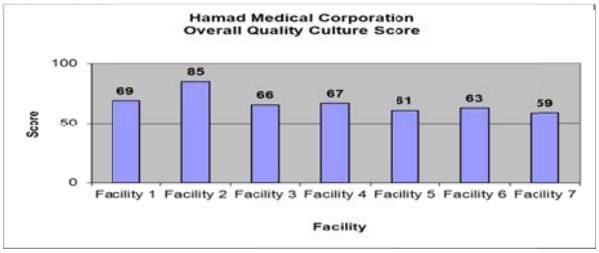
- Box Plots better demonstrate the distribution of data and give some indication on areas of consensus.



- Although allowing visual comparison across hospitals, the analysis remains weak in regard to direct quantitative comparison and lacks a HMC wide perspective.

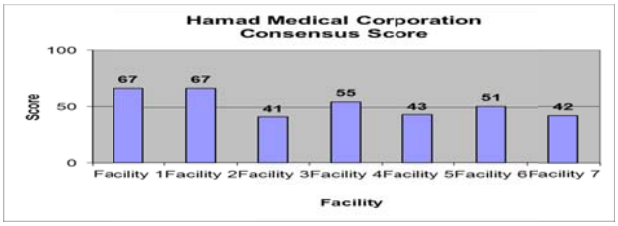
Aggregate Improvement Score

- Converting to a total % score for Improvement Culture allows better quantitative comparison across hospitals and over time while giving an easy to understand high level overview of all results.
- This was calculated as follows by adding all median scores for the seven dimensions and then adjusting the total to range from 0 to100.



Consensus Score

- Being able to apply one numerical score to each hospital regarding consensus allows us to review the degree to which participants agree about the dimensions. High levels of consensus or low variation, suggest that cultural practices are establishing (good or bad).
- A numerical score for consensus can be calculated by arithmetically summing the ranges above the 90th and below the 10th percentiles for each hospital and plotted graphically as shown below



Correlations between Dimensions

- A more advanced statistical approach can be applied to investigate the possible relationships between the seven dimensions. Correlation measures the strength of the relationship while P values measures the probability of that relationship happening by chance.
- Therefore a correlation of 0.5 or higher and a P value of 0.05, were considered relevant thresholds in establishing that a relation exists between the dimensions. A sample from one of the hospitals is shown below, with the significant relationships high-lighted in yellow.

Resources	0.478					
	0.018					
Information	0.119	0.347				
	0.58	0.097				
Targets	0.311	0.043	-0.019			
	0.139	0.842	0.93			
Tools	0.211	0.269	0.271	0.449		
	0.322	0.204	0.201	0.028		
Rewards	0	-0.393	-0.071	0.364	0.177	
	0.999	0.057	0.743	0.08	0.408	
Relationships	0.683	0.543	0.359	0.297	0.275	0.108
	0	0.006	0.085	0.159	0.193	0.616
	Risk	**Resources**	**Information**	**Targets**	**Tools**	**Rewards**

Similarities and Differences between Hospitals

- A Chi square hypothesis test can be applied to determine if a statistically significant difference is observed in the seven dimensions at each facility and each dimension. The yellow highlights in the table below indicate dimensions that were similar across all hospitals

	Risk	Resources	Info	Targets	Tools	Rewards	Relationships
P-Value	0	0.006	0.261	0.086	0.001	0.414	0.955

Lessons Learnt

- Applying statistical methods to qualitative cultural assessment tools enhances data analysis and generates comparable and measurable numerical results, with statistical relevance and identified correlation.
- This allows rich opinion–based, discrete data, collected through workshops or questionnaires, to be examined with the same rigor as continuous data.
- The data analysis can be used to support a focused improvement plan for each facility to support a healthy improvement culture and patient safety