Publications in improvement science:

how to publish, and learning from recent high impact publications

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Nicola Burgess, John Fitzsimons

International Forum on
QUALITY & SAFETY
in HEALTHCARE
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The good, bad, and ugly of improvement science publications: a scoping review

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The Basics of Writing for Publication

1. Determine how the work done contributes meaningfully to the literature (**what is the story**)

2. Determine which journal to write the paper for
   - Consider the readership
   - Ensure the journal is having the conversation about the story being told

3. Write the paper in the **correct genre** for the type of work done ensuring the reader, among other things, understands:
   - The problem being addressed
   - What gap it fills
   - Why it matters

4. Follow the author instructions for that journal

Lingard L, Watling C. Story, not study: 30 brief lessons to inspire health researchers as writers. New York: Springer; 2021 Apr 26.

The Problem

1. What is the **genre** of a QI report?

2. What does it look like when well written?

3. What instructions can we follow/use for teaching others?

Scoping Review Purpose

To explore:

The range of strategies being used by those publishing QI for writing up their work

Effective (and less effective) strategies for describing QI

Common methodological strengths and weaknesses in project design and execution

Methods

➢ Arksey and O'Malley's (2005) five stage framework was used to guide identification, selection, screening, and data collation

➢ One-year period spanning 2019 (to avoid COVID-dominance)

➢ Review and Relevancy Screening done on 318 articles from three internationally recognized journals:

- Joint Commission Journal on Quality and Patient Safety

- BMJ Quality & Safety,

- BMJ Open Quality, and

➢ Return of findings session with expert panel
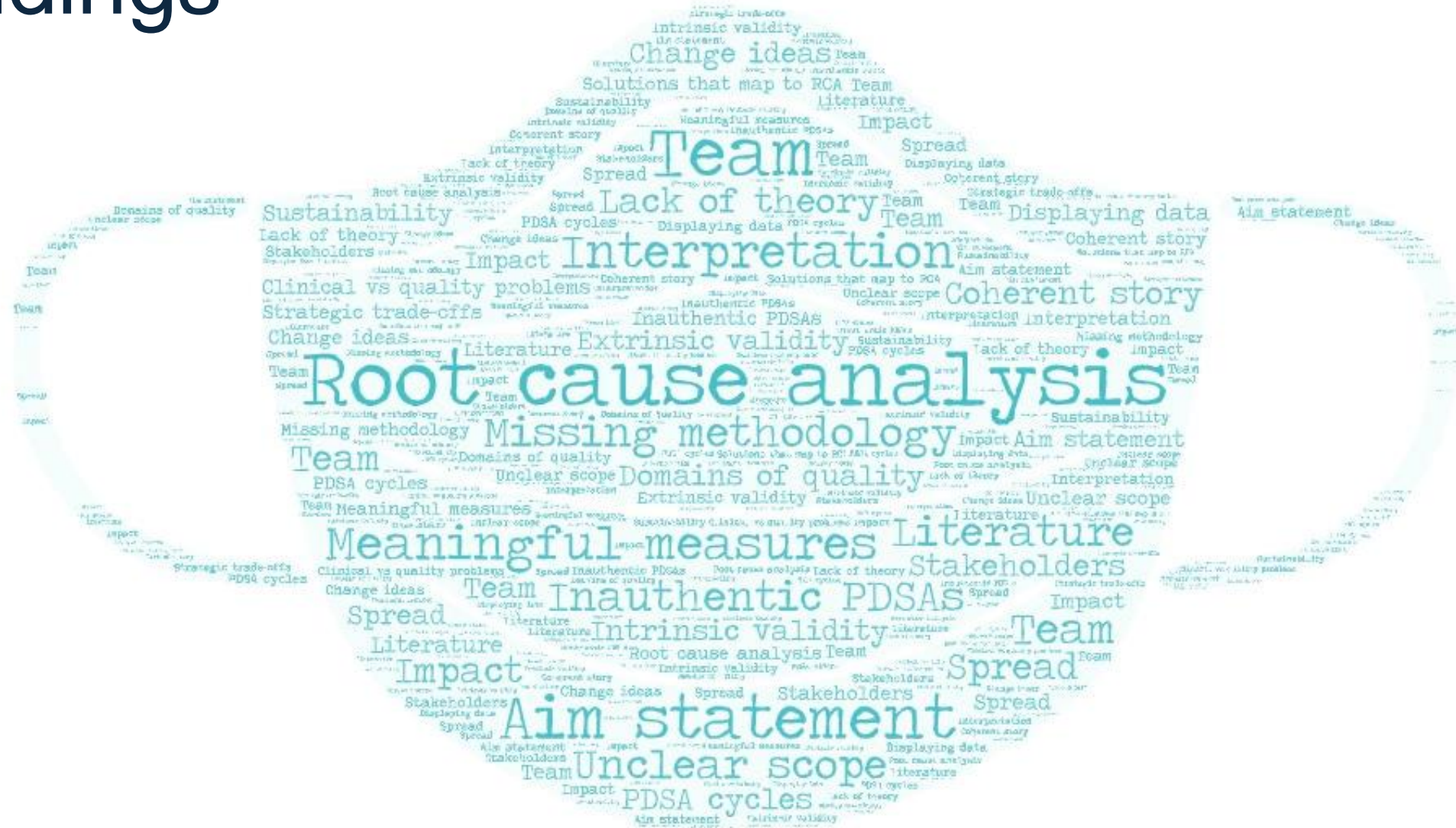
Methods - Screening

Study Type		Jt. Commission Journal Qual & Safety	BMJ Quality and Safety	BMJ Open Quality	Total
	Total	88	81	149	318
Not QI study					
Focused QI Report					
Implementation					
Full QI Report					

Methods - Screening

Study Type		Jt. Commission Journal Qual & Safety	BMJ Quality and Safety	BMJ Open Quality	Total
	Total	88	81	149	318
Not QI study		23 (26%)	15 (19%)	17 (11%)	55
Focused QI Report		40 (45%)	58 (72%)	43 (29%)	141
Implementation		13 (15%)	5 (6%)	33 (22%)	51
Full QI Report		**12 (14%)**	**3 (4%)**	**56 (37%)**	**71**

FINDINGS

Findings

PITFALLS

SOLUTIONS

FORCE FITTING INTO A CONVENTIONAL STUDY STRUCTURE

- Background
- Methods
- Results
- Discussion

PITFALLS

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FOLLOWING SQUIRE 2.0 AS THOUGH ITS A GUIDE TO A QI REPORT

Overall Structure of the Paper

PITFALLS

SOLUTIONS

FORCE FITTING INTO A CONVENTIONAL STUDY STRUCTURE

- Background
- Methods
- Results
- Discussion

FOLLOWING SQUIRE 2.0 AS THOUGH ITS A GUIDE TO A QI REPORT

FOLLOW A STRUCTURE THAT BETTER MATCHES A FULL QI REPORT, BEING SURE TO EMPHASIZE:

- Problem Description, Aims, and Context
- Approach taken and relevant theory
- Root Cause Analysis and how it was carried out (could be in supplement)
- Intervention Design and Implementation
- Study of the Interventions (including measures)

PITFALLS

SOLUTIONS

BACKGROUND 🌍

Minimal focus given to literature on the quality problem in different contexts

Failure to support the reader to understand the relevance of the problem outside of the study context, the broader quality gap and why it should matter

Failure to introduce relevant theory

INTRODUCTION

PITFALLS	SOLUTIONS

BACKGROUND 🌍

Minimal focus give to literature on the quality problem in different contexts

Failure to support the reader to understand the relevance of the problem outside of the study context, the broader quality gap and why it should matter

Failure to introduce relevant theory

🌍 BACKGROUND

Place emphasis on reviewing and citing relevant studies in the quality literature in addition the the clinical literature

Be sure to tell a compelling story that helps the reader to understand the quality gap that the QI report will address and why it matters

If applicable include reference to relevant theory that informs the work or approach to the work

INTRODUCTION

PITFALLS

SOLUTIONS

BACKGROUND

BACKGROUND

SPECIFIC AIMS

Not specific

If included, targets were rarely justified

PITFALLS	SOLUTIONS

BACKGROUND 🌍   🌍 **BACKGROUND**

SPECIFIC AIMS 🎯

Not specific

If included, targets were rarely justified

Observations from Scoping Review:

- Not specific
  - 93% specified *what for whom*
  - 61% specified *how much*
  - 58% specified *by when*
  - 39% specified *as measured by*
  - **23% included all key info**

PITFALLS	SOLUTIONS

BACKGROUND 🌍 🌎 **BACKGROUND**

SPECIFIC AIMS 🎯

Not specific

If included, targets were rarely justified

Observations from Scoping Review:

- Lack of justification
  - ○ **55% rationalized aim target**
  - ○ 40% of which were sufficient justification

PITFALLS	SOLUTIONS

BACKGROUND 🌍

🌍 BACKGROUND

SPECIFIC AIMS 🎯

Not specific

If included, targets were rarely justified

🎯 SPECIFIC AIMS

Format answers to include what for whom, by when, how much, as measured by

Justify the target (e.g. benchmark, guideline, institutional expert opinion)

PITFALLS	SOLUTIONS
BACKGROUND	**BACKGROUND**
SPECIFIC AIMS	**SPECIFIC AIMS**
ROOT CAUSE ANALYSIS	
RCA is insufficiently broad	
RCA is insufficiently deep	
Root causes are not confirmed with data	

PITFALLS | **SOLUTIONS**

Observations from Scoping Review:

- Tools used in isolation
    - **20% of papers used none** of the traditional RCA tools
- Literature and theory not cited
- Description of tool creation not included (e.g. diversity of perspectives)

ROOT CAUSE ANALYSIS

RCA is insufficiently broad

RCA is insufficiently deep

Root causes are not confirmed with data

PITFALLS

SOLUTIONS

Observations from Scoping Review:

- **Symptoms** cited as root causes

- "**Lack of solution**" cited as root cause

- 3% of papers used *5 Whys*

ROOT CAUSE ANALYSIS

RCA is insufficiently broad

RCA is insufficiently deep

Root causes are not confirmed with data

PITFALLS	SOLUTIONS

Observations from Scoping Review:

- 17% described confirmation (almost all poorly)

  - 4% reported using direct observation

  - 7% reported using Pareto

  - 1% reported using data drill down

ROOT CAUSE ANALYSIS

RCA is insufficiently broad

RCA is insufficiently deep

Root causes are not confirmed with data

INTRODUCTION

PITFALLS	SOLUTIONS
BACKGROUND	**BACKGROUND**
SPECIFIC AIMS	**SPECIFIC AIMS**
ROOT CAUSE ANALYSIS	**ROOT CAUSE ANALYSIS**
RCA is insufficiently broad	RCA should be a section unto itself (not nested in *Rationale* within Introduction)
RCA is insufficiently deep	Explicit description of how each tool was executed including, at minimum, **who** contributed to content
Root causes are not confirmed with data	Explicit description of whether findings from RCA were **confirmed**, and if so, the method of confirmation

METHODS ("Approach")

PITFALLS	SOLUTIONS
METHODOLOGY 📋	
Not mentioned	
Not rationalized	

METHODS ("Approach")

PITFALLS

SOLUTIONS

METHODOLOGY 📋

Not mentioned

Not rationalized

Observations from Scoping Review:

- A significant proportion of papers explicitly did not reference a specific approach (25%)

METHODS ("Approach")

PITFALLS	SOLUTIONS
METHODOLOGY 📋	📋 **METHODOLOGY**
Not mentioned	Explicitly mention the approach taken
Not rationalized	➢ MFI, Lean, mixed-methods
	Rationalize the approach of choice

METHODS ("Approach")

PITFALLS	SOLUTIONS

METHODOLOGY

INTERVENTIONS

Insufficient description of implementation to determine internal or external validity of the subsequent findings

METHODS ("Approach")

PITFALLS

SOLUTIONS

METHODOLOGY

METHODOLOGY

INTERVENTIONS

Insufficient description of implementation to determine internal or external validity of the subsequent findings

Observations from Scoping Review:

- **Lack of change theory**
  - 63% of interventions mapped onto appropriate root causes (Type 3 error)
- **Prioritization** of change ideas and justification of choices rarely mentioned

METHODS ("Approach")

METHODOLOGY 📋   📋 **METHODOLOGY**

INTERVENTIONS 🔽

Insufficient description of implementation to determine internal or external validity of the subsequent findings

- Insufficient description of development, testing, refinement to support authenticity of PDSA
    - **Few descriptions of all 3 types of PDSA** (40%)
    - **No PDSA described for each change idea** (32%)
    - No modifications described to change idea (25%)
    - **PDSA defined by time block instead of by change idea** (17%)
    - Term "change ideas" used interchangeably with "PDSA" (15%)
    - Multiple change ideas introduced as one PDSA (15%)
    - No PDSA described at all (6%)

METHODS ("Approach")

PITFALLS	SOLUTIONS
METHODOLOGY 📋	📋 **METHODOLOGY**
INTERVENTIONS ⬇	⬇ **INTERVENTIONS**
Insufficient description of implementation to determine internal or external validity of the subsequent findings	Explicitly map change ideas onto corresponding root causes (ideally include a Driver Diagram)

Writeup should include sufficient description to understand the **evolution** of the initial change idea

Has the author answered the question *"is the intervention being used as intended?"* (fidelity)

Minimum standards for PDSAs

➤ Leis & Shojania, 2016 |

METHODS ("Approach")

PITFALLS	SOLUTIONS
METHODOLOGY	**METHODOLOGY**
INTERVENTIONS	**INTERVENTIONS**
MEASURES	

While majority of papers reported outcome measures (or high-level process measure), most either **wholly lacked process and balancing measures** or they were insufficient for provide meaningful insight(s)

PITFALLS	SOLUTIONS

Observations from Scoping Review:

- 94% of papers had outcome measure (45% high level process measure)

- 58% of papers had ≥1 process measure

- **31% of papers had a balancing measure (mostly token measures)**

- 55% described methods employed for assessing data completeness and accuracy

MEASURES ⚖

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PITFALLS	SOLUTIONS

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MEASURES

MEASURES	**MEASURES**
While majority of papers reported outcome measures (or high-level process measure), most either **wholly lacked process and balancing measures** or they were insufficient for provide meaningful insight(s)	Require process and balancing measures
	Explicitly **link** process measures to a specific change idea
	Explain **mechanism** that links introduction of change idea to potential unintended consequence
	Acknowledge when choice of outcome measure(s) is influenced by feasibility of collection

PITFALLS

SOLUTIONS

RESULTS

Misinterpretation of results

Failing to meet minimum standards for data analysis

PITFALLS

SOLUTIONS

RESULTS 〰️

Misinterpretation of results

Failing to meet minimum standards for data analysis

Observations from Scoping Review:

- **Claims of SCV** despite inadequate baseline

- Use SPC language when interpreting run charts (e.g. SCV)

- **Unsubstantiated claim of sustainability**
  - Based on run charts
  - SPC charts with inadequate post-intervention data points

PITFALLS

SOLUTIONS

RESULTS

Misinterpretation of results

Failing to meet minimum standards for data analysis

RESULTS

Adhere to **minimum standards for displaying data**

➢ Run chart: Perla et al., BMJQS 2011;20:46-51

➢ SPC: Fretheim & Tomic, BMJQS 2015;24:748-752

PITFALLS

SOLUTIONS

INTERPRETATION

Most failed to return to the underlying quality problem and **did not relate findings to what is known and what new contributions the report adds**

While most papers discussed the nature of the association between interventions and outcomes, the rigor of those associations was questionable

Few papers shared findings, implications, and lessons learned during the RCA, design, development, and implementation phases

Many touched on **SQUIRE 2.0** elements as though they were a **checklist** that had to be addressed

PITFALLS

SOLUTIONS

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Observations from Scoping Review:

- **Insufficient exploration about why** a favourable/unfavourable result occurred/didn't occur, or a lag in impact occurred/didn't occur

- 63% of papers listed reasons for differences between observed and anticipated results; of those that did the majority were not grounded in observation/data

- **49% made comparisons to findings from other publications**

DISCUSSION

PITFALLS

SOLUTIONS

INTERPRETATION

INTERPRETATION

Most failed to return to the underlying quality problem and **did not relate findings to what is known and what new contributions the report adds**

Be sure to **return to the underlying quality problem**, relate findings to what is known and what this report contributes

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PITFALLS

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INTERPRETATION

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While most papers discussed the nature of the association between interventions and outcomes, the rigor of those associations was questionable

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INTERPRETATION

Be sure to **return to the underlying quality problem**, relate findings to what is known and what this report contributes

Highlight the features and context under which one would expect the **results to be reproducible**

➢ e.g. Dependence on a particular change champion? A key EMR feature? Grant funding?

Offer insights to **mitigate/avoid roadblocks** for future authors

Share significant lessons, findings, insights, or implications from RCA/ intervention design/development/ implementation
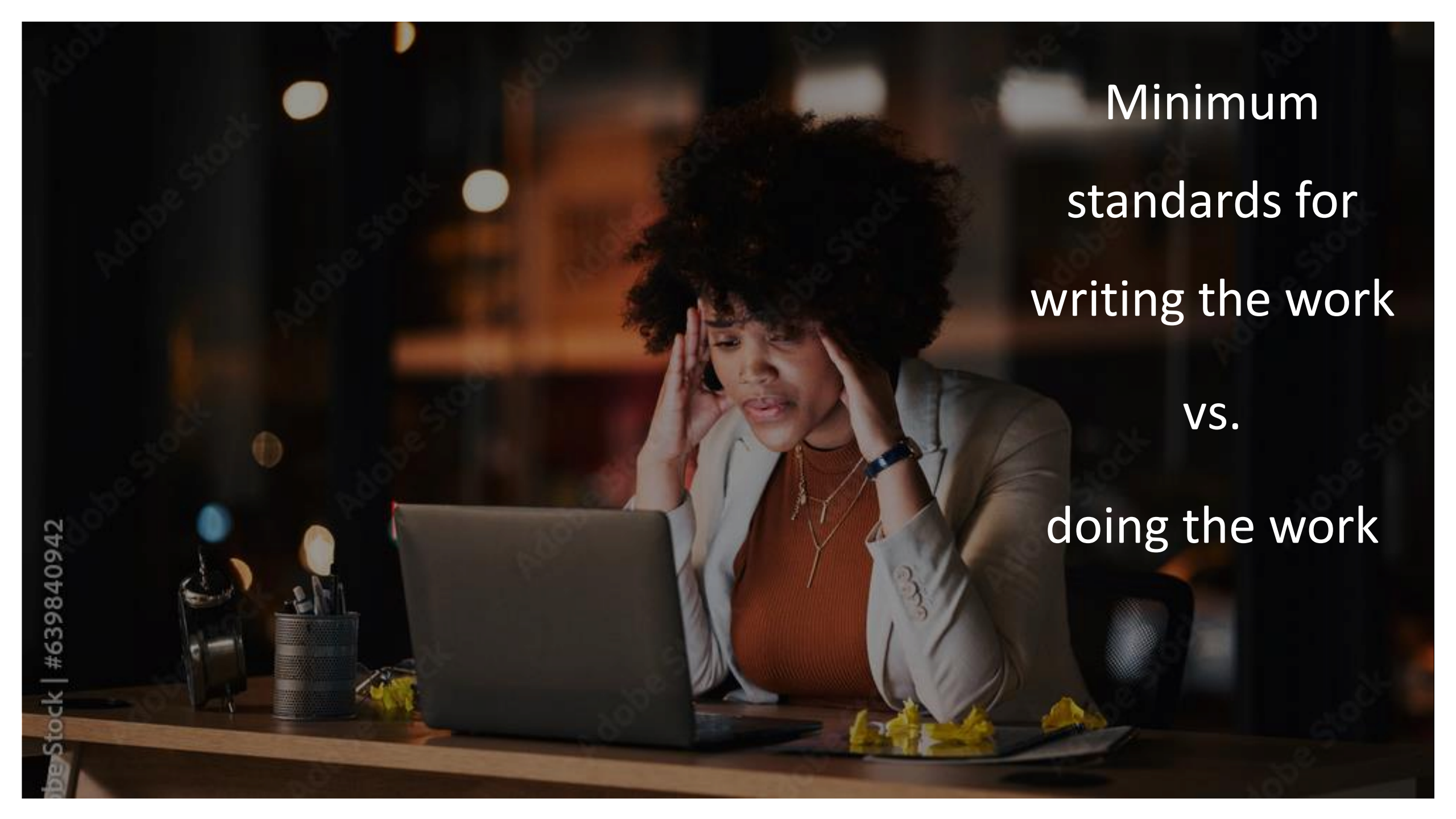
More **reflective** content

➢ what would the authors do differently and why?

DISCUSSION

The Role of the
QI Report in
Publication

Minimum standards for writing the work

vs.

doing the work

Julie E Reed, Julie K Johnson, Robert Zanni, Randy Messier, Fadi Asfour, Marjorie M Godfrey

BMJ Open Quality 2024

Quality of locally designed surveys in a quality improvement collaborative: review of survey validity and identification of common errors

Temporal pacing of outcomes for improving patient flow: Design science research in a National Health Service hospital

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Handling Editors: Lawrence Fredendall, Anand Nair, Jeffery Smith and Anita Tucker

Abstract

Improving patient flow in hospitals is a contemporary challenge in the UK National Health Service (NHS). When patients remain in a hospital bed for longer than clinically necessary, hospital performance is dramatically impacted, quality of care is reduced, and elective surgeries are cancelled at great cost to both hospital and patient. This research explains how one UK hospital employed design science research to improve patient flow after other process improvement techniques had failed. The work focused on improving patient flow through the creation of a set of interconnected, temporally paced routines that successfully engaged doctors and nurses in new, outcome-specific ways of working. These routines were both independent and interdependent, were relationally coordinated through time, and systematically and unambiguously engaged all levels of staff at specific temporal junctures. We discover that the successful adoption of these routines was cumulative rather than iterative and was aligned with ongoing efforts supporting the social aspects of change. Through this work, our case hospital saw performance improvements that moved them from being below average to the best in the country, combining improvements in patient care with savings of over £3 million in the first 12 months. The contribution of this research is twofold; first, we explain how the development of outcome-specific routines can facilitate process improvement, and second, we illustrate how design science research can successfully bridge theory and practice to promote swift and even flow in healthcare.

KEYWORDS

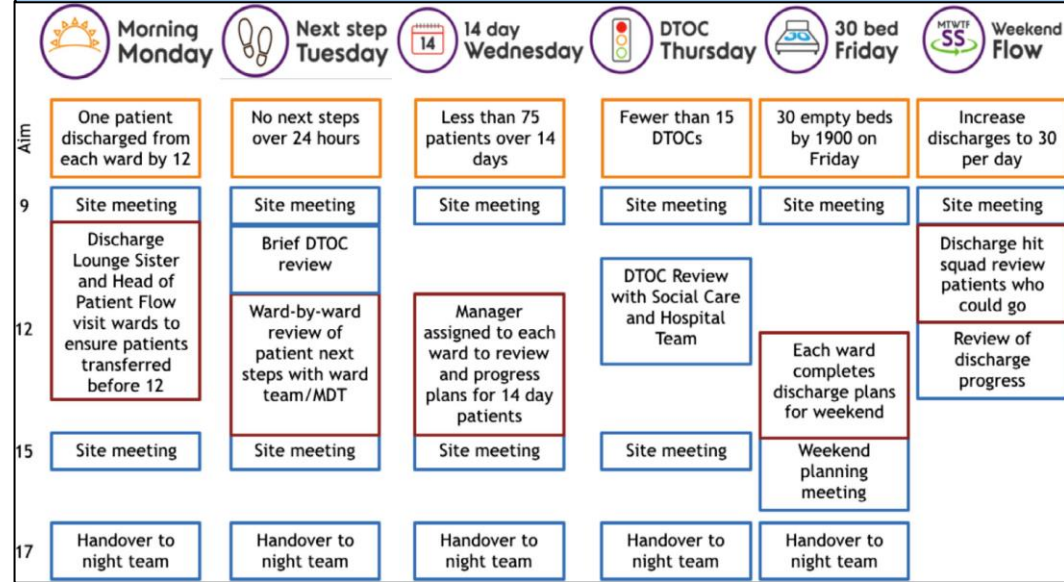design science, healthcare, hospitals, patient flow, process improvement, routines

Scan me for paper!

> *"Without theory there is no learning… And that is their downfall. People copy examples and then they wonder what is the trouble. They look at examples and without theory they learn nothing."*
> Deming Institute

Nicola Burgess, Professor of Operations Management, School for Business and Society, University of York, IFSQH 10th-12th April 2024

Yeovil hospital: a whole organisation approach to improving patient flow


Making the routines outcome specific and <u>naming a priority after each day</u>, meant people became rapidly aware of the themes and their importance.

- *Morning Monday* was particularly popular since teams were incentivized by the introduction of a monthly award for the best performance— named the "Carney Cup" after the Patient Flow Manager

- The Chief Executive mentioned in Board meetings, *"it's 14-day Wednesday today*—how are we doing against our target?" The engagement could also be seen in discussions with the broader organization as to whether the targets set were appropriate.

- *30-bed Friday* was originally named 20-bed Friday, as it was felt this would be sufficient to achieve targets for the weekend. However, the Matrons and Patient Flow Manager challenged this for being unambitious and suggested 30-bed Friday would be better.

Transferable findings:

1. Establish a shared social goal to guide the creation and implementation of new routines

2. Make the change process operationally relevant, simple, and memorable to promote inter-professional collaboration

3. Reduce variability of patient inputs

4. Interventions are cumulative and sequential

ISQua
International Society for Quality in Health Care

OXFORD
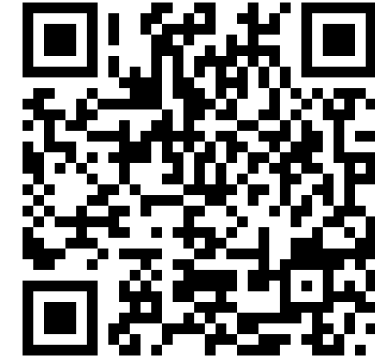
Frontiers of Improvement

Quality and safety in the time of *Coronavirus*: design better, learn faster

JOHN FITZSIMONS[1,2]

- Cast your mind back to March 2020…

- How could Safety Science and QI help in the rapidly unfolding COVID emergency?

- Learning & design as part of daily work

- Importance of behavioural science

- Examples of rapid leaning cycles and PDSA to address real challenges

- Blending standards of quality and safety science with QI

- Reflections…

Panel discussion