THE PSYCHOLOGY OF HAND HYGIENE:
HOW TO IMPROVE HAND HYGIENE USING BEHAVIOUR CHANGE FRAMEWORKS

Jocelyn Srigley, MD, MSc, FRCPC
Medical Microbiologist, BC Children's & Women's Hospitals, Vancouver, BC
Director, Infection Prevention & Control, Provincial Health Services Authority
@Jocelyn Srigley

Hosted by Paul Webber
paul@webbertraining.com

Disclosures

- No conflicts of interest

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Objectives

- Describe the psychological frameworks/theories that have been used to predict hand hygiene compliance, including motivators and barriers of hand hygiene
- Review the effectiveness of interventions based on psychological frameworks of behaviour change to improve hand hygiene compliance
- Discuss how to use behaviour change theories to implement hand hygiene interventions

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BACKGROUND

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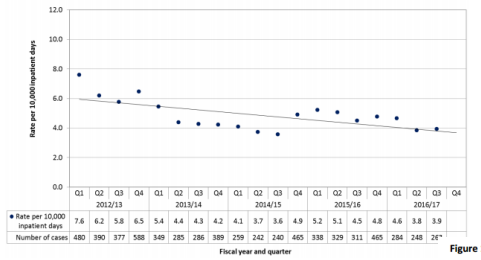
Health Care-Associated Infection Rates

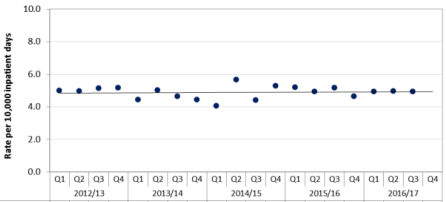
Figure 1. Provincial rate and number of new cases of CDI associated with the reporting facility, by fiscal year and quarter, 2012/13- 2016/17, British Columbia



	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
	2012/13				2013/14				2014/15				2015/16				2016/17			
Rate per 10,000 inpatient days	7.6	6.2	5.8	6.5	5.4	4.4	4.3	4.2	4.1	3.7	3.6	4.9	5.2	5.1	4.5	4.8	4.6	3.8	3.9	
Number of cases	480	390	377	588	349	285	286	389	259	242	240	465	338	329	311	465	284	248	26*	

Fiscal year and quarter

Figure 1. Provincial rate and number of new cases of MRSA associated with the reporting facility, 2012/13 - 2016/17, British Columbia



	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
	2012/13				2013/14				2014/15				2015/16				2016/17			
Rate per 10,000 inpatient days	5.0	5.0	5.1	5.2	4.4	5.0	4.7	4.4	4.1	5.7	4.4	5.3	5.2	4.9	5.2	4.6	4.9	5.0	4.9	
Number of HCA cases	336	333	362	504	305	349	334	438	283	396	333	537	361	345	382	481	324	344	353	

Fiscal year and quarter

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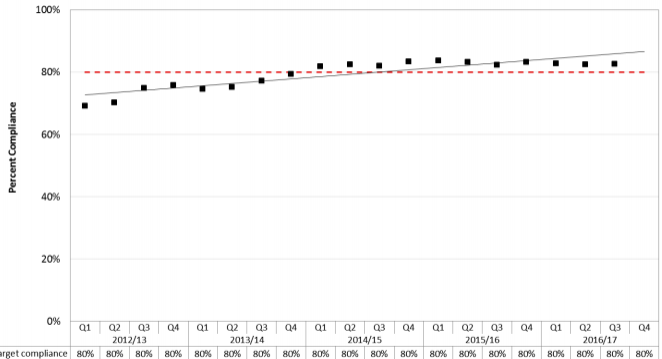
Hand Hygiene Compliance

Figure 1. Overall provincial hand cleaning compliance in acute care facilities by quarter and year, 2012/13 – 2016/17



	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
	2012/13				2013/14				2014/15				2015/16				2016/17			
Target compliance	80%	80%	80%	80%	80%	80%	80%	80%	80%	80%	80%	80%	80%	80%	80%	80%	80%	80%	80%	80%
Observations	36974	40001	43239	54854	44834	44050	46100	58009	49567	52225	59151	78864	54511	51947	47685	61967	47640	47013	48961	
Compliance	69%	70%	75%	76%	75%	75%	77%	79%	82%	83%	82%	83%	84%	83%	82%	83%	83%	83%	83%	

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Multimodal Hand Hygiene Strategies

WHO

- System change
- Training and education
- Evaluation and feedback
- Reminders in the workplace
- Institutional safety climate

Just Clean Your Hands

- Environmental changes and system supports
- Education
- Monitoring and feedback
- Opinion leaders and champions
- Patient engagement
- Senior management support

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System Change and Education

Cochrane Database of Systematic Reviews

Interventions to improve hand hygiene compliance in patient care

Review | Intervention

Dinah J Gould, Donna Moralejo, Nicholas Drey, Jane H Chudleigh

First published: 8 September 2010

"Introducing alcohol-based hand rub accompanied by education/training is not enough"

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Reminders

Journal of Infection and Public Health (2017) 10, 295–298

ELSEVIER

http://www.elsevier.com/locate/jiph

A ubiquitous but ineffective intervention: Signs do not increase hand hygiene compliance

David J. Birnbach[a,*], Lisa F. Rosen[b], Maureen Fitzpatrick[b], Ruth Everett-Thomas[b], Kristopher L. Arheart[c]

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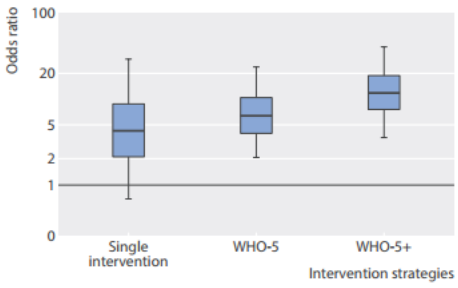
Systematic Review of Interventions

- Compared 3 types of studies:
  - Single interventions
  - WHO approach
  - WHO approach + goal setting, incentives, or accountability



Luangasanatip, 2015

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Changing Behaviour vs. Culture

- Behaviour change
  - Individual level
  - Based on psychological theories
- Culture change
  - "The way we do things around here"
  - Group interactions
  - Based on sociological theories
  - E.g. frontline ownership, positive deviance

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BEHAVIOUR CHANGE FRAMEWORKS FOR PREDICTING HAND HYGIENE BEHAVIOUR

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Journal of Hospital Infection 91 (2015) 202–210

Available online at www.sciencedirect.com

Journal of Hospital Infection

journal homepage: www.elsevierhealth.com/journals/jhin

Review

Applying psychological frameworks of behaviour change to improve healthcare worker hand hygiene: a systematic review

J.A. Srigley [a,*], K. Corace [b], D.P. Hargadon [a], D. Yu [a], T. MacDonald [c], L. Fabrigar [c], G. Garber [a]

[a] Public Health Ontario, Toronto, Ontario, Canada
[b] University of Ottawa, University of Ottawa Institute of Mental Health Research, Ottawa Hospital Research Institute, Ottawa, Ontario, Canada
[c] Department of Psychology, Queen's University, Kingston, ON, Canada

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Objectives

- Primary
  - To review the effectiveness of interventions based on psychological theories of behaviour change to improve HCW hand hygiene compliance
- Secondary
  - To determine which frameworks have been used to predict HCW hand hygiene compliance

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Methods

- Multiple databases and reference lists of included studies were searched
- Eligibility criteria
  - Studies that applied psychological frameworks to improve and/or predict HCW hand hygiene compliance
  - English language, published, peer-reviewed studies with primary data
- All steps in selection, data extraction, and quality assessment performed independently by two reviewers

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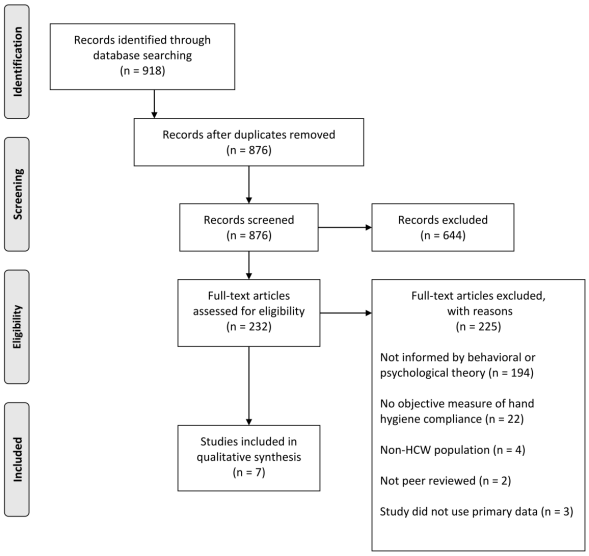
Search Results



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Summary of Predictive Studies

Study	Design	Participants (N)	Theoretical Framework	Outcome Variable
O'Boyle, Henly, & Larson (2001)	Longitudinal observational	Nurses (120)	Theory of Planned Behaviour	Direct observation
Eiamsitrakoon et al. (2013)	Observational	All HCW (123)	Transtheoretical Model, Theory of Planned Behaviour	Direct observation, self-report
Fuller et al. (2014)	Qualitative cross-sectional survey	All HCW (207)	Theoretical Domains Framework	Direct observation (poor hygiene instances only)

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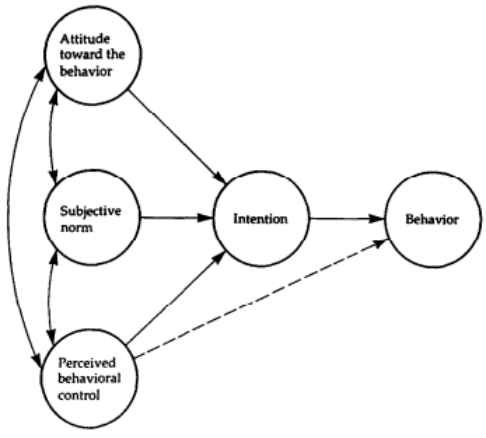
Theory of Planned Behaviour (TPB)



Ajzen, 1991

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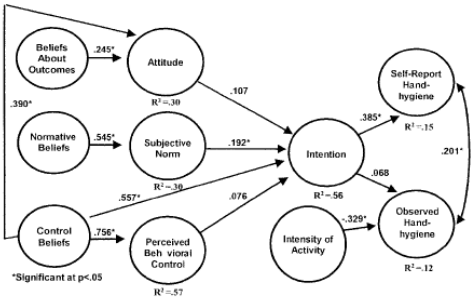
O'Boyle et al, 2001

- 120 nurses completed TPB-based questionnaire and then were observed
- Model predicted intention to hand wash, which was related to self-reported compliance
- No constructs associated with observed compliance



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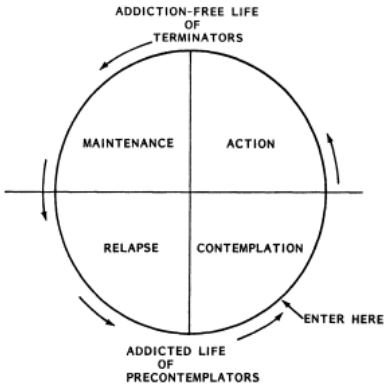
Transtheoretical Model (TTM)



Prochaska & DiClemente, 1986

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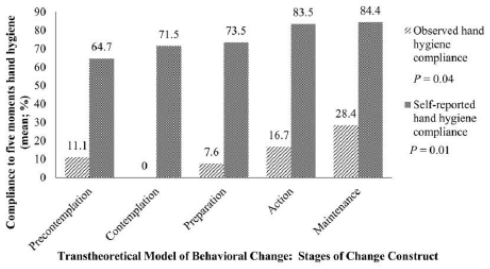
Eiamsitrakoon et al, 2013

- 123 HCWs were observed and then completed a survey based on TPB and TTM
- Total TPB scores correlated weakly with observed compliance and moderately with self-reported compliance
- Both observed and self-reported compliance increased with higher TTM stage



Transtheoretical Model of Behavioral Change: Stages of Change Construct

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Theoretical Domains Framework (TDF)

- Knowledge
- Skills
- Social/professional role and identity
- Beliefs about capabilities
- Optimism
- Beliefs about consequences
- Reinforcement
- Intentions
- Goals
- Memory, attention, and decision processes
- Environmental context and resources
- Social influences
- Emotion
- Behavioural regulation

Cane et al, 2012

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Fuller et al, 2014

- 207 HCWs who missed hand hygiene opportunities were asked to provide an explanation, which were coded based on TDF
- Explanations for non-compliance
  - Memory/attention/decision making (42%)
    - E.g. "forgot," "preoccupied," "in a rush"
  - Knowledge (26%)
    - E.g. "thought gloves were adequate," "unaware hands [needed] to be cleaned after making beds"

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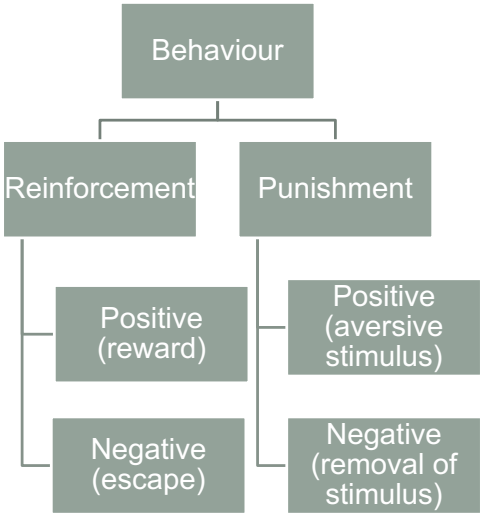
Operant Learning Theory



Skinner, 1953

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EVIDENCE FOR INTERVENTIONS BASED ON BEHAVIOUR CHANGE FRAMEWORKS

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Summary of Intervention Studies

Study	Design	Participants (N)	Theoretical Framework	Outcome Variable
Fuller et al. (2012)	Stepped-wedge cluster randomized trial	All HCW (60 wards)	Goal Setting, Control, Operant Learning Theory	Covert direct observation, hand soap & alcohol rub procurement
Harne-Britner, Allen, & Fowler (2011)	Controlled before-after	Nurses, personal care assistants (1203)	Change Theory, Positive Reinforcement	Direct observation, unit infection rates
Mayer et al. (2011)	Controlled before-after, followed by time series	HCWs (36,123 hand hygiene opportunities)	Theory of Planned Behaviour, Positive Reinforcement	Direct observation, MRSA & VRE infection rates
Pontivivo, Rivas, Gallard, Yu, & Perry (2012)	Uncontrolled before-after	All HCW (11,247 hand hygiene moments)	Transtheoretical Model	Direct observation, *S. aureus* bacteremia

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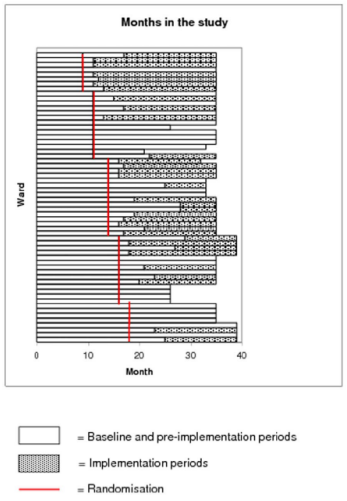
Fuller et al, 2012

- 3 year stepped wedge cluster randomized controlled trial involving 60 units
- Intervention
  - HCWs encouraged to set goals and action plans to perform hand hygiene, and feedback was provided on their compliance (based on goal-setting and control theories)
  - Positive reinforcement for following recommended practices (operant learning)



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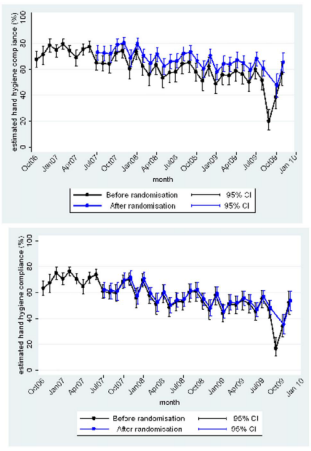
Fuller et al, 2012

- Significant increase in hand hygiene compliance and soap consumption on intensive therapy units but not geriatric units



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Harne-Britner et al, 2011

- Controlled before-after study on 3 medical-surgical units
  - All completed self-study module on hand hygiene
  - 1 unit received positive reinforcement (sticker system)
  - 1 unit received information on risks of non-compliance
- Informed by operant learning and change theories
- 15.5% increase in hand hygiene compliance on positive reinforcement unit after 1 month
- After 6 months, no significant differences in compliance or HAI rates between groups

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Mayer et al, 2011

- 6 year study on 12 units
  - Phase 1 – stepped wedge study of intervention informed by TPB (education, audit/feedback, access to hand sanitizer)
  - Phase 2 – positive reinforcement strategies implemented hospital-wide
- Significant increase in compliance in experimental groups compared to controls during phase 1
- Increase in compliance from 28.7% to 59.1% during phase 2
- No changes in HAI rates

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Pontivivo et al, 2012

- Before-after study of intervention based on TTM and Pathman awareness-to-adherence model
  - Coaching, competitions, group evaluation, and feedback
- After 1 year, significant increase in hand hygiene compliance among nurses and medical staff, but not allied health
- Non-significant reduction in health care-associated *S. aureus* bacteremia rates

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Summary of Systematic Review

- 2 of 3 studies found that behavioural theory could predict hand hygiene behaviour
- 4 theory-informed interventions had mixed results but generally resulted in increases in hand hygiene compliance among HCW
- Unclear how the frameworks are informing interventions
  - Interventions tended to rely largely on standard multimodal programs
- Indicates potential benefit of applying behaviour change theory, although sustainability and generalisability across clinical settings is yet to be demonstrated

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USING BEHAVIOUR CHANGE FRAMEWORKS

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Types of Behaviour

Deliberative	Spontaneous
• Slow, effortful, relies on executive functioning and rules • Frameworks include TPB, TTM, operant learning • Hand hygiene studies to date have taken this approach	• Fast, effortless, shaped by context • May lead to habit formation • Frameworks include MODE model of attitude-behaviour consistency, focus theory of normative conduct, habit theories

Cane et al, 2012

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Framework Determines the Intervention

Deliberative/Explicit

- E.g. theory of planned behaviour
  - Target injunctive norms (i.e. perceptions of what others think we should do)
- E.g. operant learning
  - Intervention = positive reinforcement
  - Individuals habituate to rewards quickly, causing rewards to lose their reinforcing properties

Spontaneous/Implicit

- E.g. focus theory of normative conduct
  - Target descriptive norms (i.e. perceptions of what people are actually doing)
- E.g. habit theory
  - Establish strong automatic associations between performance of a behaviour and contextual cues, then ensure those cues are present

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How to Use a Framework

1. Find a psychologist to work with
2. Choose a framework
3. Assess motivators and barriers to hand hygiene using behaviour change constructs from that framework
4. Develop intervention based on the framework and assessment results
5. Evaluate

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Conclusions

- New strategies are needed to improve hand hygiene compliance and reduce HAIs
- Psychological frameworks of behaviour change demonstrate significant potential for predicting hand hygiene behaviour and informing interventions to improve hand hygiene compliance
- More research is needed
- Collaboration with experts in psychology and behaviour change is essential

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QUESTIONS?

jocelyn.srigley@cw.bc.ca
@JocelynSrigley

www.webbertraining.com/schedulep1.php

uly 26, 2017	*(South Pacific Teleclass)* **THE IMPACT OF CATHETER ASSOCIATED URINARY TRACT INFECTION** Speaker: **Prof. Brett Mitchell**, Avondale College of Higher Education, Australia
ugust 10, 2017	**LEARNING INFECTION CONTROL VIA GAMES** Speaker: **Prof. Anne-Gaëlle Venier**, Centre Hospitalier Universitaire de Bordeux, France
ugust 23, 2017	*(South Pacific Teleclass)* **BIOFILMS IN THE HOSPITAL ENVIRONMENT - INFECTION CONTROL IMPLICATIONS** Speaker: **Prof. Karen Vickery**, Macquarie University Faculty of Medicine, Australia
ugust 24, 2017	*(FREE Teleclass)* **SOCIAL MEDIA: USELESS OR USEFUL IN INFECTION PREVENTION?** Speaker: **Barley Chironda**, IPAC Canada National Social Media Manager
eptember 14, 2017	**RELATIONSHIP BETWEEN PATIENT SAFETY CLIMATE AND ADHERENCE TO STANDARD PRECAUTIONS** Speaker: **Dr. Amanda Hessels**. Ann May Center for Nursing, Columbia University
eptember 18, 2017	*(FREE European Teleclass - Broadcast live from the 2017 IPS conference)* ***Cottrell Lecture ...* IGNITING PASSION, SPARKING IMPROVEMENT** Speaker: **Julie Storr**, World Health Organization
	(FREE European Teleclass - Broadcast live from the 2017 IPS conference)

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