Management in health
XXIII/3/2019; pp. 3-6

BEST PRACTICE

# BEHAVIOUR SCIENCE: THEORETICAL DOMAINS FRAMEWORK REPRESENTATION WITHIN NURSING IMPLEMENTATION STUDIES

***Associate Professor Craig LOCKWOOD,*** *RN, PhD The Joanna Briggs Institute, Faculty of Health and Medical Sciences, The University of Adelaide SA 5005*
***Ms Anna PEARCE,*** *The Graduate School of Medicine, The University of Wollongong, Wollongong NSW 2500*
***Dr Raluca SFETCU,*** *Spiru Haret University, Department of Psychology and Educational Sciences, Bucharest; National School of Public Health, Management and Professional Development Bucharest*
***Associate Professor Zoe JORDAN,*** *The Joanna Briggs Institute, Faculty of Health and Medical Sciences, The University of Adelaide SA 5005*

***AIMS: The purpose of this study was to evaluate whether the Theoretical Domains Framework domains can be identified in implementation reports, and to explore whether evidence based clinical audit and feedback has an implicit conceptual basis in behavioural theory. BACKGROUND: Clinical Audit and Feedback is a well-recognised approach to implementation. Although widely used, there has been little progress with respect to understanding the mechanisms of action (the key 'active ingredients.'). Improved conceptualization of clinical audit within behaviour theory may support the identification of features that systematically influence the effectiveness of interventions. DESIGN: Framework analysis of nursing implementation reports. METHODS: Joanna Briggs Institute implementation reports were tested against the core definitions for each TDF domain or sub constructs. Associations between Levels of Credibility and textual data were also assessed. RESULTS: There is clear evidence of behavioural theory domains and constructs in published Implementation Reports. The most frequently identified domains and concepts appeared to fit the operational boundaries within the realm of a clinician. Conversely, the least frequently identified domains and concepts were categorised as subjective, and less tangible to the day to day practice of clinicians.***

***Keywords: Theoretical domains framework (TDF), Clinical audit, implementation, evidence-based healthcare***

## INTRODUCTION

Clinical Audit and Feedback (A&F) is a well-recognised approach to implementation, with demonstrated potential to impact clinical practice [1]. Introduced in UK in the 80s the practice of clinical audit is now an established part of the NHS landscape and a key component of the clinical governance framework, all healthcare professionals being expected to participate in clinical audit work [2]. In other countries, the uptake of A&F approach was achieved by integration in standardized approaches to evidence implementation, as it is the case for the Joanna Briggs Institute Evidence Base Clinical Fellowship Program, which originated in Australia but is currently implemented in five other countries (Brazil, Denmark, Singapore, Switzerland and USA). In just a few decades, A&F has widely spread, and it is currently one of the most studied healthcare quality improvement (QI) interventions, with over 140 published randomised controlled trials and four systematic reviews evaluating the method to this date [3–6].

Despite the continuous interest in the A&F approach, demonstrated both by clinicians and researchers, there has been little progress with respect to understanding the mechanisms of action (the so called key 'active ingredients.') for this intervention [1]. One reason could be the complexity of the intervention and the numerous individual and organisational factors which can inhibit clinician-led practice change[7, 8]. A recent study, attributes this limited progress to the fact that many A&F interventions are developed and tested without an explicit attempt to consider relevant theories [9]. It has, therefore, been suggested that the way forward resides in the conceptualization of A&F within a theoretical framework which can support the identification of features that systematically influence the effectiveness of interventions [10].

One such framework is the Theoretical Domains Framework (TDF, developed to identify the theoretical aspects of healthcare interventions which target behaviour change [11, 12]. The TDF integrates large numbers of recognised behavioural characteristics into 14 validated domains [11]. The TDF highlights theories accessible to implementation scientists and healthcare professionals using practice change strategies that include behaviour change [11].

From 2005 to 2018, over 350 health professionals from 25 countries (Australia, Brazil, Cameroon, China, Denmark, Ethiopia, Ghana, Hong Kong, Indonesia, Iran, Kenya, Korea, Malawi, Malaysia, Myanmar, Nairobi, Nepal, New Zealand, Papua new Guinea, Saudi Arabia, Singapore, Switzerland, Tanzania, Uganda and USA) successfully completed the JBI EBCFP program and over 220 implementation reports with homogeneity of methodology and method have been published in peer-reviewed journals.

## STUDY AIM/ PURPOSE

The primary objective of this study was to determine the range of behaviour changes targeted and described in JBI implementation studies by retrospectively applying the domains and constructs of the TDF to published implementation reports. We further aimed to identify highly reported domains as well as under-reported ones, in order to provide baseline evidence of any association between behaviour theory and audit and feedback as an implementation strategy.

**Searching and selection**.We searched the JBI Database of Systematic Reviews and Implementation Reports (JBI SRIR) for implementation projects published between the years 2016 to July 2017,

Management in health
XXIII/3/2019; pp. 3-6

*Table I: Levels of credibility*

| | Level of Credibility | Definition |
|---|---|---|
| 1. | Unequivocal (highest level) | (findings accompanied by an illustration that is beyond reasonable doubt and; therefore, not open to challenge). |
| 2. | Credible | (findings accompanied by an illustration lacking clear association with it and therefore open to challenge). |
| 3. | Not supported (lowest level) | (findings are not supported by the data). |

*Table II: Frequency count of domains from the TDF in selected implementation reports*

| Total number of studies n=21 | | |
|---|---|---|
| **Domain** | Frequency of studies reporting domain specified (N) | Percentage of studies reporting domain specified (%) |
| 1. Knowledge | 21 | 100 |
| 2. Skills | 14 | 67 |
| 3. Social/professional Role and identity | 20 | 95 |
| 4. Beliefs about capabilities | 15 | 71 |
| 5. Optimism | 5 | 24 |
| 6. Beliefs about consequences | 7 | 33 |
| 7. Reinforcement | 8 | 38 |
| 8. Intentions | 8 | 38 |
| 9. Goals | 21 | 100 |
| 10. Memory attention & decision process | 7 | 33 |
| 11. Environmental context and resources | 20 | 95 |
| 12. Social influences | 13 | 62 |
| 13. Emotion | 2 | 10 |
| 14. Behavioral regulation | 14 | 67 |
| **Total** | **175** | **100** |

inclusive of all topics, specialties and countries of origin. We note other authors have taken similar approaches [13].

## DATA EXTRACTION AND ANALYSIS

Data extraction was "open" and iterative, by which we mean that we considered any analytic data or descriptive text within the implementation reports which aligned with the TDF domains or their sub components as evidence.

We used the 14 domains from TDFv2 as a basis for coding TDF domains [11]. The TDF domains were identified and coded independently by two reviewers <redacted for peer review>, using a data extraction form designed for the purpose. We used domains as well as the constructs within domains to inform coding decisions. The coding of each domain was supported by evidence from the text which was rated for level of credibility (reported below). Following discussion between authors, agreement was achieved on the coding and levels of credibility.

Levels of credibility are a qualitative measure that facilitate reporting of directness between data and interpretations arising from data. The levels of credibility were applied as per the standard operational definitions reported in table I; this was undertaken by one of the authors and independently reviewed by a co-author [8].

### Ethical considerations

As this was secondary analysis, ethics approval was not sought, no individual or aggregate participant data has been reported, and no data that may identify any individual from the implementation reports (which are also anonymised before being published) was extracted or recorded.

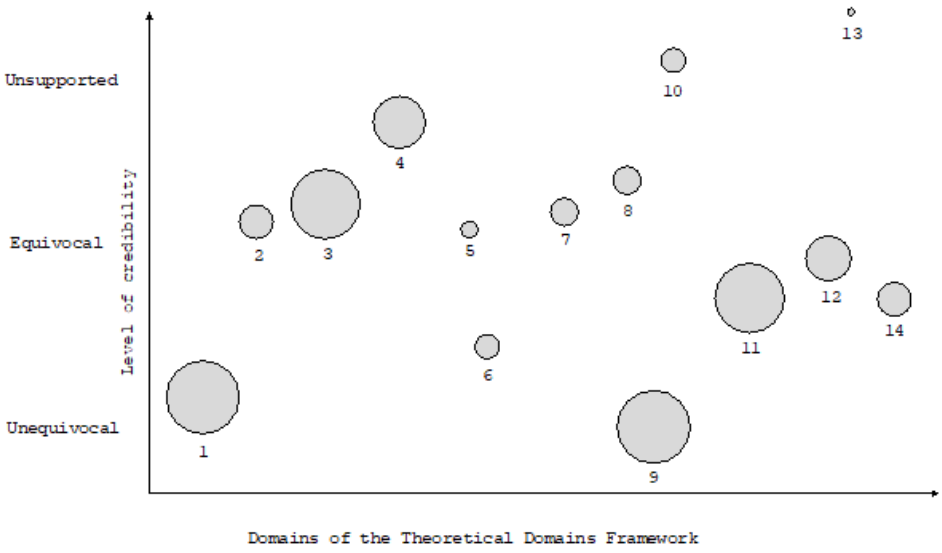
## RESULTS

The objective of this study was to map TDF domains and component construct as explicitly or implicitly described in 21 JBI implementation reports published in the JBI SRIR between January 2016 and July 2017. Of the 21 implementation reports, the majority were conducted by nursing staff (in 18 clinical settings), nurses and midwives (in 2 clinical settings), and a rural health care multidisciplinary team (in one setting). The geographic locations included China (13), Australia (5), United States of America (2) and Singapore (1).

The projects addressed aspects of general clinical practice (4), implementation on surgical and medical interventions (6) and assessment, investigation or management of a specific disease or condition (11). With one exception (a primary care centre) all implementation projects were conducted in inpatient care settings. The TDF domains with high frequency coverage (mapped in >95% of the reports) included goals, knowledge, social/ professional role and identity and environmental context and resources.

Domains with moderate frequency coverage (mapped in 40-95% of the reports) included beliefs about capabilities, skills, behavioural regulation, and social influences. The theoretical domains with a low frequency coverage (i.e. mapped in <40% of the reports) are: emotion, optimism, beliefs about consequences, memory, attention and decision processes, reinforcement and intentions.

*Figure 1: Schematic representation of the frequency and credibility of the 14 theoretical framework domains*




Of the 175 identified data items aligned with the TDF, only around one third were unequivocal (37%), the majority being equivocal (52%), or not supported (11%). Figure I schematically represents the frequency of reporting per domain and the associated level of credibility. The higher the frequency of domain reporting, the larger the figure, while the better the level of credibility, the lower each figure sits toward the horizontal axis of the graph. Positioning in relation to the horizontal access is a measure of the directness of association, which as per figure one does not directly correlate with frequency of representation of the TDF domains within the implementation reports.

Optimism, reinforcement, intentions, memory and attention processes and emotion are among the domains which were less frequently mapped, and found by the evaluators to have been inconsistently addressed (i.e. with equivocal or unsupported ratings on the levels of credibility measures). Conversely, knowledge and goals were mapped with high frequency and were also evaluated as being unequivocal by the raters.

## DISCUSSION

The aim of this study was to map domains of the TDF in implementation reports generated following the JBI approach. We evaluated 18 months of published implementation studies from four different countries and included all studies regardless of setting, topic or the health professions involved. There was substantive diversity of topics across settings and geographic regions, which gave us confidence that the results would demonstrate a level of sampling variation that would avoid a bias based on geographic region, culture, setting or topic. We note that the main professionals involved were nurses; the nursing process has congruency with in evaluating clinical care [14, 15].

Studies and systematic reviews have found that audit with feedback enables implementation of best practice, and can be used effectively either at the unit level, or in multi-unit or multi-site programs of activity where evaluation of structures and processes of care are indicated [8]. This study suggests that clinical audit projects are multi-faceted interventions which include between 5 and 12 behavioural change domains (with an average of 8 domains per implementation report) attributes as well as the core Donnabedian quality improvement parameters of structure and process evaluation.

Implementation studies differ from intervention studies in that they tend to focus on what we can learn about implementation theory or processes rather than on measuring effect sizes [16, 17]. A systematic review of electronic audit and feedback (a similar implementation design to JBI Implementation studies) found very limited (two of seven included studies) used explicit theoretical guidance within a limited subset of the TDF domains [17]. This finding is at odds with our findings, in our study, each TDF domain was identified in at least one JBI Implementation Report which suggests the JBI Clinical Fellowship program may have attributes which other audit and feedback programs do not.

As the aim of this study was to identify domains of the TDF in the IRs of JBI, our results are also subjected to a number of limitations. Firstly, we employed a generic coding methodology, solely mapping if reports explicitly addressed one of the TDF domains and not mapping whether the actions implemented were consistent with the ones proposed in validation studies [11]. Secondly, it is possible that reports are focused on few domains while, in reality, several other domains were addressed in order for the implementation to be successful.

## CONCLUSIONS

The findings of this study demonstrated that the JBI EBCFP Implementation Reports have a conceptual basis inclusive of behavioural elements in the TDF. The domains and categories that have good coverage include goals, knowledge, social/ professional role and identity and environmental context and resources. Not all domains of the TDF were identified in each implementation report, yet each report showed positive, evidence-based changes in clinical practice, suggesting the coverage of all domains may not be necessary for successful implementation of evidence-based practice. Successful behaviour change may be achievable with a limited range of relevant TDF domains or concepts [18].

Levels of credibility were allocated based on the measure of directness and the measure of confidence in the

association. The mapping of domain by frequency and level of credibility does not support a link between the level of credibility and the frequency with which a datum was reported across the included studies.

Hospitals routinely collect key performance indicator data that is often framed within the Donnabedian framework and is therefore a good fit for clinical audit and feedback-based implementation studies, and a direct fit with the JBI EBCFP.

Current programmatic teaching and facilitation of the JBI implementation studies results in consistently high rates of improvement and integration of evidence in to practice across cultures and contexts, including lower and middle-income economy settings [19–21].

**Conflict of Interest**: the authors declare they have no direct or indirect financial interests to declare.
**Acknowledgements**: The work which underpinned this submission was unfunded. The authors have a professional and scholarly interest in implementation science, and conceived of the idea, undertook the methods and wrote the paper up without any direct or indirect financial support.

**References**

1. Ivers NM, Sales A, Colquhoun H, Michie S, Foy R, Francis JJ, et al. No more 'business as usual' with audit and feedback interventions: towards an agenda for a reinvigorated intervention. Implement Sci. 2014;9:14.
2. Scrivener R, Morrell C, Baker R, Redsell S, Shaw E, Stevenson K, et al. Principles for best practice in clinical audit. Natl Inst Clin Excell Natl Inst Clin Excell Lond Radcliffe Med Press. 2002.
3. Evans C, Howes D, Pickett W, Dagnone L. Audit filters for improving processes of care and clinical outcomes in trauma systems. Cochrane Database Syst Rev. 2009;:CD007590.
4. Ivers N, Jamtvedt G, Flottorp S, Young JM, Odgaard-Jensen J, French SD, et al. Audit and feedback: effects on professional practice and healthcare outcomes. Cochrane Database Syst Rev. 2012;:CD000259.
5. Pantoja T, Opiyo N, Lewin S, Paulsen E, Ciapponi A, Wiysonge CS, et al. Implementation strategies for health systems in low-income countries: an overview of systematic reviews. Cochrane Database Syst Rev. 2017;9:CD011086.
6. Thomson O'Brien MA, Oxman AD, Davis DA, Haynes RB, Freemantle N, Harvey EL. Audit and feedback versus alternative strategies: effects on professional practice and health care outcomes. Cochrane Database Syst Rev. 2000;:CD000260.
7. Duncan EM, Francis JJ, Johnston M, Davey P, Maxwell S, McKay GA, et al. Learning curves, taking instructions, and patient safety: using a theoretical domains framework in an interview study to investigate prescribing errors among trainee doctors. Implement Sci IS. 2012;7:86.
8. Lockwood C, Munn Z, Porritt K. Qualitative research synthesis: methodological guidance for systematic reviewers utilizing meta-aggregation. Int J Evid Based Healthc. 2015;13:179–87.
9. Colquhoun HL, Brehaut JC, Sales A, Ivers N, Grimshaw J, Michie S, et al. A systematic review of the use of theory in randomized controlled trials of audit and feedback. Implement Sci. 2013;8:66.
10. Foy R, Eccles M, Jamtvedt G, Young J, Grimshaw J, Baker R. What do we know about how to do audit and feedback? Pitfalls in applying evidence from a systematic review. BMC Health Serv Res. 2005;5:50.
11. Cane J, O'Connor D, Michie S. Validation of the theoretical domains framework for use in behaviour change and implementation research. Implement Sci IS. 2012;7:37.
12. Noar SM, Zimmerman RS. Health Behavior Theory and cumulative knowledge regarding health behaviors: are we moving in the right direction? Health Educ Res. 2005;20:275–90.
13. Lipworth W, Taylor N, Braithwaite J. Can the theoretical domains framework account for the implementation of clinical quality interventions? BMC Health Serv Res. 2013;13:530.
14. Kitson A, Conroy T, Wengstrom Y, Profetto-McGrath J, Robertson-Malt S. Defining the fundamentals of care. Int J Nurs Pract. 2010;16:423–34.
15. Lockwood C, Aromataris E, Munn Z. Translating evidence into policy and practice. Nurs Clin North Am. 2014;49:555–66.
16. Steinmo SH, Michie S, Fuller C, Stanley S, Stapleton C, Stone SP. Bridging the gap between pragmatic intervention design and theory: using behavioural science tools to modify an existing quality improvement programme to implement "Sepsis Six." Implement Sci. 2016;11:14.
17. Tuti T, Nzinga J, Njoroge M, Brown B, Peek N, English M, et al. A systematic review of electronic audit and feedback: intervention effectiveness and use of behaviour change theory. Implement Sci. 2017;12:61.
18. French SD, Green SE, O'Connor DA, McKenzie JE, Francis JJ, Michie S, et al. Developing theory-informed behaviour change interventions to implement evidence into practice: a systematic approach using the Theoretical Domains Framework. Implement Sci IS. 2012;7:38.
19. 19. Bayuo J, Munn Z, Campbell J. Assessment and management of burn pain at the Komfo Anokye Teaching Hospital: a best practice implementation project. JBI Database Syst Rev Implement Rep. 2017;15:2398–418.
20. Minn WW. Enhancing patient safety in hemodialysis nursing care practice among nurses in the renal unit at the Defence Services General Hospital: a best practice implementation project. JBI Evid Synth. 2014;12:467–488.
21. Shimoda GT, Soares AVN, Aragaki IMM, McArthur A. Preventing nipple trauma in lactating women in the University Hospital of the University of Sao Paulo: a best practice implementation project. JBI Database Syst Rev Implement Rep. 2015;13:212–32.