

# **The use of implementation theories, models, and frameworks in veterinary medicine – protocol for a scoping review**

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## **ABSTRACT**

Evidence based practices (EBPs) provide proven ways to improve the health, welfare, and productivity of veterinary species. However, ensuring implementation and uptake into routine practice of these EBPs is often challenging. In human healthcare, one approach used to improve implementation are the theories, models and/or frameworks of implementation science, however the extent of the use of this approach in veterinary medicine is unknown. The aim of this scoping review is to identify existing veterinary uses of theories, models and frameworks used in implementation science, and to understand the focus of these applications. Peer reviewed journal articles and grey literature detailing the use of an implementation theory, model and/or framework in a veterinary context will be included. Searches will be conducted in CAB Abstracts, MEDLINE, Embase and Scopus. Grey literature will be searched including organisations known to have worked in this field and ProQuest Dissertations and Theses Global. Data charting will include study characteristics, species, intervention, and details of use of implementation theories, models and/or frameworks.

## **INTRODUCTION**

### **Rationale**

In veterinary medicine it has long been recognised that there is a research-to-practice ‘gap’, with many examples of circumstances where there is failure to implement proven evidence-based practices (EBPs) (Garforth et al. 2004; Wolf et al. 2015; Hamilton 2018).

Traditionally, a key part of introduction of EBPs has been to focus on education of stakeholders (Philpotts, Dillon, and Rooney 2019; Brennan et al. 2020). However, it is important to note that the transfer of knowledge alone is insufficient to ensure successful implementation of EBPs (Aregbesola et al. 2020). As was succinctly put by one respondent when interviewed about the challenges facing the veterinary profession; “it’s not knowing more stuff that we need—we need to basically to be able to implement it better” (Ruston et al. 2016).

The struggle to bridge the research to practice ‘gap’ is not solely confined to veterinary medicine, a similar challenge is recognised in human healthcare. It takes on average 17 years for EBPs to be incorporated into routine practice, and even then only about half of EBPs ever make it into general clinical usage (Balas and Boren 2000). Recognition of this issue led to the emergence of the field of implementation science. Implementation science can be defined as “the scientific study of methods to promote the systematic uptake of research findings and other evidence-based practices into routine practice, and, hence, to improve the quality and effectiveness of health services” (Eccles and Mittman 2006). It draws on many other areas such as social psychology and health behaviour change (Presseau et al. 2021). The backbone of implementation science is the use of formal constructs

(theories, models and/or frameworks) to guide, explain and/or evaluate the process of implementation (Nilsen 2015).

A recent veterinary review (Biesheuvel et al. 2021) recognised that there has been increasing interest over the last decade in understanding the complexities of implementing behaviour change interventions that improve uptake of EBPs, with studies often focused on attempting to understand the factors involved (Wynands et al. 2021; Moya et al. 2021). However, this review also concluded that work to date has often failed to consider contextual environments and tended to lack the use of theoretical frameworks and/or empirically validated constructs (Biesheuvel et al. 2021). Furthermore, in many cases the focus is on a broad subject area or disease process (for example biosecurity or mastitis) rather than looking more specifically at defined EBPs (Brennan and Christley 2013; Sayers et al. 2013; Shortall et al. 2016; Ritter et al. 2017).

It is proposed that the next logical step in seeking to address the veterinary medicine research to practice 'gap' is to look more in depth at the details of implementing specific EBPs using empirically validated formal constructs that consider both personal influences as well as wider contextual environments (Biesheuvel et al. 2021; Krasuska and Webb 2018). In short, to look to the field of implementation science. This path has already been well trodden by those working in human healthcare and the application of hundreds of theories, models and/or frameworks to aid the implementation of EBPs has repeatedly proven its value (Kirk et al. 2015; Moullin et al. 2019). It is logical to propose that the implementation science approach could be of considerable value to veterinary medicine, and therefore improve the health, welfare, and productivity of our domestic animal species.

It is unclear to what extent theories, models and/or frameworks have been used to inform implementation in veterinary medicine. Therefore a scoping review is proposed to map work in this area, as well as to identify any gaps in the literature. The aim of the scoping review is to identify existing veterinary uses of theories, models, and frameworks to inform implementation, and to understand the focus of this usage.

## **Objectives**

The objective of this scoping review is to identify the usage of implementation theories, models, and frameworks in the context of veterinary medicine.

### **Primary Objective:**

The scoping review's primary objective is to answer the question: "What implementation theories, models and frameworks have been used in veterinary medicine?". As such the key elements or the review are:

- Population – N/A
- Concept – Implementation theories, models and/or frameworks
- Context – Veterinary Medicine

For clarity, the below definitions will be used:

- **Implementation theories, models and/or frameworks** - Formal constructs that seek to do one or more of three things: (1) describe and/or guide the process of implementation, (2)

understand and/or explain what influences implementation outcomes and/or (3) evaluate implementation (Nilsen 2015)

- **Veterinary medicine** - The maintenance of health of animals through the diagnosis, treatment, prevention and control of diseases or injuries, the promotion of animal well-being and welfare and the prevention of transmission of animal diseases to people.
  - Caveat – in order to give a feasible scope to the search, animal species will be limited to common domestic species – namely chickens, cows, sheep, goats, horses, donkeys, aquaculture, dogs, cats, and rabbits.

### **Secondary Objective:**

A secondary objective is to then explore how the implementation theory, model or framework has been used:

- **Context:**
  - Whether the use has been in the context of implementation (defined as the uptake of research findings and other EBPs into routine practice (Eccles and Mittman 2006)) or another context such as behavioural science (defined as “the study of anything a person does in response to internal or external events” (Davis et al. 2015)) with no focus on a specific research finding or EBP.
- **Focus:**
  - What intervention(s), disease etc. have been the focus of use of the model, theory and/or framework.
- **Aim:**
  - Whether the theory, model and/or framework has been used to (1) describe and/or guide the process of implementation, (2) understand and/or explain what influences implementation outcomes and/or (3) evaluate implementation (Nilsen 2015).
- **Timing:**
  - Has the theory, model and/or framework been utilised prior to data collection or following data collection.

This information will be captured as part of the data extraction process.

## **METHODS**

### **Protocol and Registration**

This protocol was written using the Preferred Reporting Items for Systematic Reviews and Meta-Analysis for Scoping Reviews (PRISMA-ScR) reporting guidelines (Tricco et al. 2018). It will be published on the Centre for Evidence Based Veterinary Medicine website and will also be available at SYREAF ([www.syreaf.org](http://www.syreaf.org)).

### **Eligibility criteria**

To be included in the review, papers need to use an implementation theory, model and/or framework in the context of veterinary medicine as defined under the primary objective above.

Articles will be included if they are primary research, have an abstract available in English, are under the topic of veterinary medicine, use an implementation theory, model and/or framework and refer to it in the Methods and/or Results section(s). To allow a comprehensive search, no limits will be placed on date of publication or language of full text. Articles will be excluded if they focus on animals in the wild or veterinary education.

### **Information sources and Search**

The search protocol was drafted by the lead author with assistance from an experienced librarian (AA) and research team members (MB and IR). An approach adapted from that described by Bramer et al. (2018) was used to optimise the search strategy.

The search will be carried out in two stages:

#### **Stage 1**

In the first stage, the following three databases will be searched for relevant studies: CAB Abstracts, MEDLINE and Embase through the Ovid interface.

The search strategy for Embase is detailed at the end of this protocol. This will be translated into search strings relevant for MEDLINE and CAB abstracts. The searches across all three databases will be carried out on the same day. Individual database search results will be imported into Endnote X9 (The EndNote Team, Philadelphia, PA) and duplicates removed. Once this has been done, the full reference list will be imported into the Rayyan software tool ([www.rayyan.ai](http://www.rayyan.ai)), a software program that aids collaboration amongst reviewers. Following screening, data will be extracted from included articles using a pre-designed and tested Microsoft Form and downloaded into an Excel sheet. Manual reference list screening and citation searching of all included studies will be performed for additional but missing relevant studies.

Search results from this first stage will go through the full screening and data charting process to give a preliminary body of data before proceeding onto the second stage of the search.

#### **Stage 2**

The second stage will take the most used implementation theories, models and/or frameworks identified by the first stage and use these to search Scopus, alongside the generic implementation terms and the veterinary medicine terms. In addition, the grey literature will be searched using similar terms. The websites of UK/international organisations known to have produced work in this area will be searched, and where applicable snowball sampling will be undertaken to uncover further websites/organisations that would have relevant material. The following organisations' websites will be searched initially, with the potential for additional websites to also be included:

- Human Behaviour Change for Animals (HBCA, UK)
- Department for Environment, Food and Rural Affairs (DEFRA, UK)
- World Organization for Animal Health (OIE - International)
- Agriculture and Horticulture Development Board (AHDB - UK)
- Dogs Trust (UK)
- Cats Protection (UK)
- Society for the Protection of Animals Abroad (SPANNA – international)
- Brooke – Action for Working Horses and Donkeys (International)
- ProQuest Dissertations and Theses Global

## **Selection of sources of evidence**

Two reviewers will independently perform the screening, eligibility and inclusion of studies blindly using the Rayyan software tool. If there is disagreement, this will first be attempted to be resolved through discussion. If a collective agreement cannot be reached, a third reviewer will be consulted. Both the title and abstract screening and full text screening will initially be trialled by two reviewers with the first 10% of records entering each stage of the process, prior to proceeding with screening all papers. This pilot will identify any procedural issues prior to undertaking the full screening process.

Citation screening will occur in two independent stages:

### **1. Title and Abstract review**

The title and abstract will be reviewed, and taking into account the eligibility criteria detailed above, literature selected according to the following questions:

1. Is the abstract available in English?
  - Yes or maybe: continue to question 2.
  - No: exclude
2. Is the article primary research?
  - Yes or maybe: continue to question 3
  - No: exclude
3. Is the focus of the article animals in the wild or veterinary education?
  - Yes: exclude
  - Maybe or no: continue to question 4
4. Is the literature relevant to veterinary medicine?
  - Yes or maybe: continue to question 5
  - No: exclude
5. Is use of an implementation theory, model or framework mentioned?
  - Yes or maybe: include
  - No: exclude

In cases where a title and full text is available but no abstract, it will be carried through to full text review, unless it is clear from the title that it is not relevant.

### **2. Full text review**

Considering the eligibility criteria detailed above, literature will be included according to the following questions

1. Is full text available via the University of Nottingham library or the British Library?
  - Yes or maybe: continue to question 2.
  - No: exclude
2. Is the article primary research?
  - Yes or maybe: continue to question 3
  - No: exclude

3. Is the focus of the article animals in the wild or veterinary education?
  - Yes: exclude
  - Maybe or no: continue to question 4
4. Is the literature relevant to veterinary medicine?
  - Yes or maybe: continue to question 5.
  - No: exclude
5. Is use of an implementation theory, model or framework used in the Methods or Results?
  - Yes or maybe: include
  - No: exclude

#### Selection of Grey literature:

This will follow a similar process as described above, with screening of title (+/- abstract) followed by full text screening. In addition, grey literature must contain at least the following data items (or for these to be able to be obtained) to be included:

- Type of literature
- Date of publication
- Species involved
- Named theory, model and/or framework
- Description of use of theory, model and/or framework (minimum - context, focus and timing as defined in the secondary objective section above)

#### Data charting process

Data charting will be conducted by two reviewers using a pre-designed Microsoft Form and then exported into Excel. If there is disagreement, this will first be attempted to be resolved through discussion, if a collective agreement cannot be reached, a third reviewer will be consulted. The data charting form will be pre-tested using a random sample of studies, and any improvements made as necessary based on feedback. Once data charting has been completed, the Excel will be locked to avoid unintentional alterations during the analysis phase.

#### Data Items

The following data items are proposed for extraction from the literature. These may change as the study progresses to include additional or revised responses.

- Country where study was undertaken
- Country as listed in first author address
- Date of publication (when first available)
- Type of literature (e.g. blog post, research article, pamphlet)
- Source of publication (e.g. journal name etc.)
- Aim of the study or publication
- Type of organisation behind publication (e.g. university, government etc.)
- Source of funding
- Species involved
- Theory, model and/or framework(s) used

- Description of use of theory, model and/or framework
  - a. Context of use:
    - i. Use will be classified as ‘implementation’ if a specific intervention(s) is the focus of the use of the implementation theory, model and/or framework.
    - ii. Use will be classified as ‘behavioural’ if the focus is on human behaviour but in respect to anything other than implementation of a specific intervention(s)/EBPs
    - iii. Other classifications will be recorded as appropriate
  - b. Focus – i.e. details of specific intervention(s), disease process etc.
  - c. Aim (e.g. to guide implementation, to explain implementation etc.)
  - d. Timing
- Summary of overall conclusions

### Critical appraisal

As this is a scoping review, a critical appraisal of the literature will not be performed.

### Synthesis of results

The findings will be summarised using descriptive statistics with results presented via a combination of tables, graphs, figures, and descriptive text. The context, focus, aim and timing of usage of implementation theories, models and/or frameworks will be identified and discussed, alongside any gaps in the literature.

### Funding

BBSRC and MSD Animal Health

### Search string for Embase:

<p><b>Concept –</b> Known Implementation theories, models and/or frameworks</p>	<p>((("4E's Process theory") or ("AACCS framework*" or "Access, Align, Connect, Care, Sustain") or ("Absorptive Capacity") or ("Accelerating Improvement" adj3 model*) or ("Achieving Breakthrough Improvement" adj3 model*) or ("Action Learning Set Facilitation") or ("Action model* of Consumption") or ("action model*" adj3 "Cancer Survivorship") or ("Action Research") or ("Active Case finding" adj3 model*) or ("Active Implementation framework*") or ("Adaptation Design and Impact" adj3 model*) or ("Adaptation in dissemination and implementation") or ("adaptive implementation" adj3 model*) or ("Addiction Technology Transfer Center" adj3 model*) or ("Adherence model*") or ("Adherence Optimisation" adj3 framework*) or ("Adult Learning" adj3 Principle*) or ("Adult Learning" adj3 theor*) or ("Advancing health disparities research within the health care system") or ("Advancing Research and Clinical Practice Through Close Collaboration" or (ARCC adj3 model*)) or ("Affective Events" adj3 theor*) or ("African American faith setting*" adj3</p>
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(model\* or framework\*) or ("ageing and health" adj4 framework\*) or ("Agile Implementation") or ("AIDS Risk Reduction" adj3 (framework\* or model\*)) or ("Alcohol and Drug Prevention" adj3 model\*) or ("Analyzing Adoption of Complex Health Innovation\*") or ("Analyzing Stakeholder Safety Engagement Tool") or ("Analysis of Policy Change" adj4 framework\*) or ("artificial intelligence technologies in clinical setting\*") or ("Ask, Assist, Refer") or ("Assess, Advise, Agree, Assist and Arrange") or ("Assisting Practitioner\* Intervention Planning") or ("Audit and Feedback framework\*") or ("Awareness to Adherence" adj3 model\*) or ("Barrier Assessment") or ("Behavior Change Wheel") or ("Behavior Prediction" adj3 model\*) or ("Behavioral Alternative" adj3 model\*) or ("behavior change" adj3 (framework\* or theor\* or model\*)) or ("behavioral change" adj3 model\*) or ("Behavioral Choice" adj3 theor\*) or ("Biodiversity Conservation and Sustainable Use") or ("biotic ligand model\*" adj4 framework\*) or ("Black Dog" adj4 model\*) or ("Blueprint for Dissemination") or ("Brief Action Planning") or ("CAN-Implement.Pro.") or ("Capability Opportunity Motivation and Behavior" or "COM-B") or ("Capacity for sustainability" adj3 framework\*) or ("Capacity Opportunit\* Motivation - Behavior") or ("Care and support" adj3 model\*) or ("Care Coordination Implementation Collaborative") or ("Champion model\*") or ("Choosing Wisely" adj3 framework\*) or ("CHRODIS-PLUS") or ("City Engagement Process" adj3 framework\*) or ("classical diffusion" adj3 theor\*) or ("Clinical Transformation in Technology" adj3 framework\*) or ("Clinical Work Assessment" adj3 model\*) or ("cloud-based longitudinal care plan\*" adj6 model\*) or ("Cognitive Behavioral theor\*") or ("Cognitive Continuum" adj3 theor\*) or ("Cognitive Social Health Information Processing") or ("Cognitive theor\*") or ("Cognitive-Experiential" adj3 theor\*) or ("Collaboration") or ("Collaborating Across Systems for Program Implementation") or ("Collaborative Care" adj3 model\*) or ("Communication Effect\*" adj3 model\*) or ("Communities that Care") or ("Community Based Participatory Research" or "CBPR") or ("Community based prevention service\*") or ("community based program sustainability" adj6 (model\* or framework\*)) or ("Community based program\* for violence prevention and substance abuse prevention") or ("community based rehabilitation" adj3 framework\*) or ("Community Coalition Action" adj3 theor\*) or ("Community Connection" adj3 model\*) or ("Community engaged Behavioral Interventions to Reduce Health Disparities" adj3 framework\*) or ("community health improvement process") or ("Community of Practice theor\*") or ("Community of Practice" adj3 framework\*) or ("Community Organization and Development for Health Promotion" or ("Community Organization and Development" adj4 model\*)) or ("Community orientated primary care" adj3 framework\*) or ("Community to Community Mentoring" adj3 model\*) or ("Complex Adaptive System\*") or ("complex innovation implementation" adj3 framework\*) or ("Complexity theor\*") or ("Compliance with Evidence-based Guidelines" adj6 framework\*) or ("conceptual framework\* for implementation science") or ("conceptual framework\*" and Lau) or ("conceptual model\*" and EBI) or ("Conceptualizing Dissemination Research and Activity") or ("Conduct and Utilization of Research in Nursing") or ("conNECT framework\*") or ("Consumption of Social Practices") or ("Contact theor\*") or ("Context and Implementation of Complex Intervention\*") or ("context-based evidence-based decision-making") or ("contextual interaction" adj3 theor\*) or ("Control theor\*") or ("Coordinated Implementation" adj3 model\*) or ("Core Functions" adj3 framework\*) or ("Core implementation

component\*") or ("Core Step\*" adj3 "Effective Implementation") or ("Critical Realism and the Arts Research Utili#ation model\*" or "CRARUM") or ("Critical Success Factors") or ("cultural sensitivity in health promotion and substance use programs") or ("Cultural tailoring") or ("customi#ed, holistic, analytical, network-building, grassroots, evaluatory") or ("Design focused implementation") or ("Design Science") or ("Designing and evaluating interventions to eliminate racial and ethnic disparities in health care") or ("Determinants of Innovation within Health Care Organi#ations") or ("Development Strategy" and Ashford) or ("Deviant Behavio?r" adj3 theor\*) or ("Diabetes Prevention" adj3 model\*) or ("Differential Association" adj4 theor\*) or ("Diffusion of Health Promotion Innovation\*" ) or ("Diffusion of Innovation\*" adj3 "Service Organi#ation\*") or ("Diffusion of Innovation\*" adj3 (model\* or theor\* or framework\*)) or ("Diffusion, Dissemination, and Implementation of Innovation\*") or ("Disconnected Value\*" adj3 model\*) or ("Dissemination and Utili#ation of Research for Health-Care Policy and Practice") or ("dissemination in health service\* intervention research") or ("Dissemination of Evidence-based Interventions to Prevent Obesity") or ("Dissemination of Evidence-Based Polic\*") or ("Dissemination Research Design") or ("Distribution network pathway") or ("Domain-specific language" adj3 framework\*) or ("DoTTI framework\*" or "Design and develOpment, Testing early iterations, Testing for Effectiveness, Integration, and implementation framework\*") or ("Drinking and Behavio?r" adj3 theor\*) or ("Dynamic Adaptation Process") or ("Dynamic Sustainability" adj3 framework\*) or ("Early Childhood Obesity Prevention Program" adj3 framework\*) or ("Ecological framework\*") or ("Ecological Perspectives") or ("Ecological Validity" adj3 (model\* or framework\*)) or ("Ecology of Implementation framework\*") or ("Effective Dissemination Strategies") or ("Elaboration Likelihood" adj3 model\*) or ("Empowerment Pedagogy" ) or ("EMTReK" or "Evidence-based model\* for the Transfer and Exchange of Research Knowledge") or ("Enhancing the Value of Research for Dissemination and Implementation") or ("EQ-DI framework\*") or ("Estimand framework\*") or ("Ethical Space") or ("Evidence Based Implementation and Intervention Practices") or ("evidence based practice" adj3 (framework\* or model\*)) or ("Evidence based public health" adj3 model\*) or ("Evidence informed decision making") or ("Evidence informed policy and practice") or ("Evidence Informed Yoga Programs in Oncology") or ("Evidence Integration Triangle") or ("evidence into policy" adj4 framework\*) or ("evidence to practice gap" adj5 model\*) or ("Evidence\* Based System\*" adj2 ("Innovation Support" or "Implementation Support")) or ("Evidence-Based Interagency" adj4 model\*) or ("Expert Recommendations for Implementing Change") or ("Explaining Behavio?r Change in Evidence-Based Practice") or ("Exploration Preparation Implementation Sustainment") or ("Explore Values, Operationali#e and Learn and eValuate efficacy" OR (model\* adj1 evolve)) or ("Extended Parallel Process\* model\*") or ("factors influencing smoking behavio?r" adj8 model\*) or ("fast implementation" adj3 framework\*) or ("Feedback Intervention" adj3 theor\*) or ("Food Fortification Programs" adj8 framework\*) or ("Four levels of change") or ("framework\* for analy#ing" adj4 "health interventions") or ("framework\* for Spread") or ("Functional Triad") or ("General theory of implementation") or ("Generic Implementation framework\*") or ("Getting Research into Practice" adj4 "Joanna Brigg\* Institute") or ("Getting to Outcomes") or ("Goal Directed" adj3 theor\*) or ("Goal Framing" adj3 theor\*) or ("Goal Setting" adj3 theor\*) or ("Guideline implementability" adj3 framework\*)

or ("He Pikinga Waiora") or ("Health Action Process Approach") or ("Health and Illness Behavior" adj3 model\*) or ("Health Behavior Change" adj4 framework\*) or ("Health Behavior" adj3 (model\* or theor\* or framework\*)) or ("Health Belief model\*") or ("Health Communication theor\*") or ("Health Education theor\*") or ("Health Empowerment theor\*") or ("Health Equity" adj3 "Implementation framework\*") or ("Health Promotion model\*") or ("Health Promotion Research Center" adj3 framework\*) or ("Health Promotion Technology Transfer") or ("Healthcare Improvement" adj3 model\*) or ("Healthy Youth Places" adj3 framework\*) or ("Hierarchical model\* of Intrinsic and Extrinsic Motivation") or ("hospital Deprescribing" adj3 "Implementation framework\*") or ("House of Quality for Behavioral Science") or ("Human-centered design") or ("I-Change model\*") or ("Implementation capital") or ("Implementation Climate") or ("Implementation Effectiveness" adj3 (model\* or theor\*)) or ("Implementation Fidelity" adj3 framework\*) or ("Implementation framework\* for immunization in peri-urban slums") or ("Implementation framework\*" adj3 (EHR or "electronic health records")) or ("Implementation Intention\*") or ("Implementation model\*" adj3 "Public Health") or ("implementation of certification procedures" adj3 framework\*) or ("Implementation of Change model\*") or ("Implementation of Complex System Intervention\*") or ("implementation of practice change" adj6 model\*) or ("Implementation of Research Evidence") or ("Implementation Outcomes") or ("Implementation Process Assessment Tool") or ("Implementation Process" adj3 model\*) or ("Implementation Research" adj3 (model\* or theor\* or framework\*)) or ("Implementation Science Research Development") or ("Implementation Teams") or ("Improvement and Agile Global Health" adj3 model\*) or ("Improvement Cycles") or ("Improvement Wheel") or ("improving chronic illness care" adj3 model\*) or ("Improving the Dissemination of Nursing Research") or ("Indigenous Health Promotion" adj4 model\*) or ("inducing change in professional behavior" adj3 model\*) or ("Information Motivation Behavior\*r\*") or ("Information Processing" adj3 model\*) or ("Information technology adoption" adj3 model\*) or ("innovation adoption" adj3 model\*) or ("Innovation and Improvement Sustainability" adj3 model\*) or ("innovation development" adj3 model\*) or ("Innovation Diffusion" adj3 model\*) or ("Innovation\* Implementation" adj3 framework\*) or ("Innovative Care for Chronic Conditions" adj3 framework\*) or ("Integrating Science, Policy, and Practice") or ("Integrative model\* of health and attitude behavior change") or ("interaction and Research utilization" adj3 framework\*) or ("Interactive Systems framework\*") or ("International Physical Activity" adj3 framework\*) or ("Interorganization\* Relation\*" adj4 theor\*) or ("Interpersonal Behavior" adj3 theor\*) or ("Intervention Mapping") or ("introduction of a new medical test" adj7 framework\*) or ("Iowa model\*") or ("i-PARIHS" or "iPARIHS" or "integrated Promoting Action on Research Implementation in Health Services") or ("knowledge building" adj3 theor\*) or ("Knowledge Exchange" adj3 framework\*) or ("Knowledge Exchange-Decision Support") or ("knowledge integration and translation") or ("Knowledge integration" adj3 (model\* or process)) or ("knowledge into action" adj3 framework\*) or ("knowledge into practice" adj4 framework\*) or ("knowledge management" adj3 framework\*) or ("Knowledge to Action") or ("Knowledge Transfer and Exchange") or ("knowledge transfer" adj3 (model\* or approach)) or ("knowledge translation between research and practice in clinical settings" adj3 model\*) or ("Knowledge Translation" adj3 (theor\* or framework\* or model\*)) or

("Knowledge Use in Pain Care") or ("knowledge utilization" adj3 (model\* or framework\*)) or ("Knowledge value chain") or ("Knowledge, Adaptation, Translation and Scale-up") or ("Language Expectancy" adj3 theor\*) or ("LEAD framework\*") or ("lean management" adj4 framework\*) or ("Lean Method\*") or ("LEAN Transformation Process\*") or ("Learning Strategy of Exploration, Conceptualization and Application") or ("Linkage model\*") or ("Linking System\*" adj3 (framework\* or approach)) or ("Living Implementation framework\*") or ("Locally Based Research Transfer" adj6 model\*) or ("Marketing and Distribution System\*" adj6 "Public Health") or ("Meaningful Learning" adj3 theor\*) or ("Mechanism\* of Change" adj3 "Implementation") or ("Medical Research Council" adj3 (framework\* or guidance)) or ("Mobile Ecological model\* for the Promotion of Physical Activity") or ("model\* and Checklist for Telehealth") or ("model\* for Predictors of Adoption") or ("Motivation Opportunit\* Abilit\*" adj3 model\*) or ("national cancer\* institute" adj4 model\*) or ("National Implementation Research Network") or ("National Institute for health research Collaboration for Leadership in Applied Health Research and Care" and implement\*) or ("Natural Helper Intervention") or ("Navigation Chart") or ("Need\* Opportunit\* Abilit\*") or ("neuro-rehabilitation" adj4 "implementation framework\*") or ("Norm Activation" adj3 theor\*) or ("Normalisation Process theor\*") or ("Normative Conduct" adj3 theor\*) or ("Normative Social Behavior" adj3 theor\*) or ("Novice to Expert" adj3 theor\*) or ("Nurturing care" adj3 framework\*) or ("open systems" adj3 theor\*) or ("operant conditioning" adj3 theor\*) or ("Operant Learning theor\*") or ("Organization Implementation model\*") or ("Organizational Change" adj3 theor\*) or ("Organizational Development" adj3 theor\*) or ("Organizational Innovation Adoption") or ("Organizational model\*" adj3 "Innovation Implementation") or ("Organizational Readiness" adj3 (theor\* or change)) or ("Orientation-Discussion-Decision-Implementation") or ("Outcomes-Focused Knowledge Translation") or ("OutPatient Treatment in Ontario Services") or ("Partnership Functioning" adj3 model\*) or ("Pathman-PRCEED") or ("Pathogen Genomics in Public Health Surveillance Evaluation") or ("Pathways to Evidence Informed Policy") or ("Patient blood management" adj3 framework\*) or ("Patient Reported Implementation science") or ("patient safety" adj4 framework\*) or ("PEN-3") or ("Personal Construct" adj3 theor\*) or ("Persuasive Communication" adj3 model\*) or ("Plan-Do-Study-Act" or "PDSA cycle\*") or ("Planned Behavior" adj3 theor\*) or ("Planned Change" adj3 theor\*) or ("Policy Development and Implementation Cycle") or ("Policy effectiveness-feasibility loop") or ("policy implementation" adj3 framework\*) or ("Policy-into-practice intervention" adj8 "management of low back pain") or ("Political Economy of Health" adj5 (model\* or framework\* or theor\*)) or ("Positive Affect" adj3 theor\*) or ("practical application of clinical evidence system") or ("Practical, Robust Implementation and Sustainability model\*") or ("Practice Change and Development" adj4 model\*) or ("PRACTIS") or ("Pragmatic-Explanatory Continuum Indicator Summary") or ("Precaution Adoption Process" adj3 model\*) or ("Precede Proceed") or ("Prepare, roll-out and sustain") or ("Pressure System" adj3 model\*) or ("Proactive Coping" adj3 theor\*) or ("Problem Behavior" adj3 theor\*) or ("Problem Solving" adj3 model\*) or ("Process Marker" adj3 model\*) or ("Pro-environment\* Behavior" adj3 model\*) or ("professional perception" adj3 model\*) or ("Program assessment feedback") or ("Program-Planning model\*") or ("Promoting Action on Research Implementation" or "PARIHS") or ("Promoting School/Community-

University Partnerships to Enhance Resilience") or ("ProPRISM") or ("Prospect theor\*") or ("Protection Motivation theor\*") or ("Prototype Willingness" adj3 model\*) or ("Public Health Research" adj3 framework\*) or ("Push–Pull Capacity") or ("Push-Pull Infrastructure") or ("Quadruple Aim" adj3 framework\*) or ("Quality Enhancement Research Initiative" or "QUERI") or ("Quality Improvement Supply Chain" adj3 model\*) or ("Rate of adopt\*" adj4 innovation) or ("Rational Addiction" adj3 model\*) or ("Readiness to Change" adj3 (model\* or theor\*)) or ("RE-AIM" or "Reach, Efficacy, Adoption, Implementation, and Maintenance") or ("Real World Dissemination") or ("Reasoned Action Approach") or ("Reasoned Action" adj3 theor\*) or ("Regulatory Fit" adj3 theor\*) or ("Relapse Prevention" adj3 model\*) or ("Reporting Adaptations and Modifications") or ("Research and Evidence in Practice" adj3 model\*) or ("Research and Policy in International development") or ("Research Development and Diffusion" adj3 model\*) or ("Research Development Dissemination and Utili#ation") or ("Research into Practice" adj3 framework\*) or ("Research Knowledge Infrastructure") or ("Research Knowledge Transfer and Utili#ation" adj3 framework\*) or ("Research Practice Integration" adj3 (model\* or framework\*)) or ("Research to Practice" adj3 framework\*) or ("Research Utili#ation" adj3 "Occupational Therap\*") or ("Research Utili#ation" adj3 model\*) or ("Risks as Feelings") or ("Rules for Dissemination") or ("School-based preventive and mental health promotion interventions") or ("Science Impact" adj3 framework\*) or ("Self-Affirmation" adj2 theor\*) or ("Self-Determination" adj2 theor\*) or ("Self-Efficacy" adj2 theor\*) or ("Self-Management theor\*") or ("Self-Regulation" adj2 theor\*) or ("Shared Decision Making" adj3 theor\*) or ("Situated Change" adj3 theor\*) or ("Situated Learning" adj3 theor\*) or ("S-NoMAD") or ("Social Action" adj3 theor\*) or ("Social Change" adj2 theor\*) or ("Social Cognitive" adj2 (framework\* or theor\*)) or ("Social Comparison" adj2 theor\*) or ("Social Consensus model\* of Health Education") or ("Social Development" adj3 model\*) or ("Social Ecolog\*" adj3 (framework\* or model\*)) or ("Social Identity" adj3 theor\*) or ("Social Influence model\* of Virtual Community Participation") or ("Social Interaction and Diffusion model\*") or ("Social Learning" adj2 theor\*) or ("Social marketing planning") or ("Social Marketing" adj2 (framework\* or model\* or theor\*)) or ("Social Network theor\*") or ("Social Norm\*" adj2 theor\*) or ("Social Practice" adj2 theor\*) or ("Social Problem Solving" adj2 (theor\* or model\*)) or ("Social Support" adj2 theor\*) or ("Sociocultural Explanatory theor\*") or ("Soft Systems Methodolog\*") or ("Stages of change" adj3 (theor\* or model\*)) or ("Stages of facilitation") or ("Stages of Implementation Completion") or ("Stages of research and evaluation") or ("Star model\*" adj3 (ACE OR "Academic Center for Evidence-Based Practice" or "knowledge transf\*")) or ("Sticky Knowledge") or ("Strategic Prevention" adj3 framework\*) or ("Structural Ecological" adj3 model\*) or ("success and breakdown factors of shared governance") or ("Supply and Demand" adj3 framework\*) or ("Supportive Management Structure") or ("Surgical Reopening" adj4 framework\*) or ("Sustainability planning" adj3 model\*) or ("System theor\*") or ("Systems E-approach") or ("systems thinking" adj4 WHO) or ("Tailored Implementation for Chronic Diseases") or ("Teaching For Implementation" adj3 framework\*) or ("Technology Acceptance" adj3 model\*) or ("Technology Adoption Criteria in Health") or ("Technology Implementation" adj3 model\*) or ("Technology Transfer" adj3 model\*) or ("Telehealth Service Implementation" adj3 (framework\* or model\*)) or ("Temporal Self-Regulation"

adj3 theor\*) or ("Terror Management" adj3 (theor\* or model\*)) or ("Theoretical Domains framework\*") or ("Theoretical model\* for Complex Implementation") or ("theory Design Implementation") or ("three phase model\*" and implementation) or ("Threefold stepwise" adj3 model\*) or ("Three-World View" adj3 model\*) or ("Toward Evidence-Informed Practice" adj2 "Program Evidence Tool") or ("Transactional Stress and Coping") or ("Transcontextual model\*" adj3 Motivation) or ("Transfer of Patient Safety Research into Practice") or ("transformational change in health care systems") or ("Translating Evidence into Action" adj3 framework\*) or ("translating evidence into practice" adj3 model\*) or ("Translating Research Into Injury Prevention Practice") or ("Translating Research into Practice") or ("Translation Science to Population Impact") or ("Translational research" adj4 (framework\* or paradigm)) or ("Transtheoretical model\* of Behavior?r\* Change" or "Transtheoretical model\* of Change") or ("Triadic Influence" adj3 theor\*) or ("Triple P" adj3 framework\*) or ("understanding change" adj3 framework\*) or ("Understanding User Context") or ("University of Hawai'i Center for 'Ohana" adj6 "Self-Management of Chronic Illness\*") or ("Usable Innovation\*") or ("Utili#ation Focused" adj3 framework\*) or ("Workforce Development" adj3 model\*) or (("7-Step" or "seven step") adj3 framework\*) or (("Active with OsteoArthritis" adj4 "Implementation model\*") or "Aktiva") or (("Attitude\* Social Influence" adj2 "Self Efficacy") or (ASE adj3 model\*)) or (("Chronic Disease" adj4 mHealth) and framework\*) or (("Consolidated framework\*" adj3 "Implementation Research") or "CFIR") or (("Continuous Quality Improvement" or CQI) adj3 model\*) or (("Culture of Wellness in Preschool\*" or COWP) adj3 framework\*) or (("health information technology" or HIT) adj4 framework\*) or (("McCain Y-AP" or "McCain youth-adult partnership") adj3 "implementation model\*") or (("Measurement-based care" or MBC) adj6 "Implementation Planning Guide") or (("Reflective Impulsive" adj3 model\*) or ("Dual Process" adj3 theor\*)) or (("Replicating Effective Program\*" or REP) adj3 framework\*) or (("Social Context" adj2 "Health Behavior?r\*") and (framework\* or model\*)) or (("Strength\* Weakness\* Opportunit\*" adj2 Threat\*) or SWOT) or (("Sustainable Management" adj6 "Agricultural Resources") and model\*) or (((model\* or framework\*) adj3 "evidence based healthcare") or (JBI adj3 (model\* or framework\*))) or ((ARC adj5 organi#ational) or "Availability, Responsiveness and Continuity") or ((CARS or "Cardiovascular Absolute Risk Screening") adj3 "implementation model\*") or ((CBLC or "community based learning collaborative") adj3 model\*) or ((Constructivist adj3 theor\*) not grounded) or ((evidence adj2 implementation) and (model\* or framework\*)) or ((Facilitat\* adj3 "Best Practice\*") and (model\* or framework\*)) or ((FCU OR "Family check-up") adj4 framework\*) or ((Grol adj6 (framework\* or model\*)) or "Grol and Wensing") or ((KTP or "Knowledge Translation Platform\*") adj4 model\*) or ((MNDR or "Maternal and neonatal death review") adj4 framework\*) or ((NASSS adj6 framework\*) or "non-adoption, abandonment, scale-up, spread and sustainability") or ((NMP or "non-medical prescribing") adj3 framework\*) or ((PEPPA adj2 framework\*) or "Participatory, Evidence-based, Patient focused Process") or ((PROM or PROMS or "patient-reported outcome measure\*") adj4 model\*) or ((step\* adj4 "evidence based practice") and (model\* or program\* or framework\*)) or ((sustainability adj4 "public health") and framework\*) or ((sustaining adj6 innovation\*) and (theor\* or model\*)) or ((telemedicine adj6 "Noncommunicable Diseases") and framework\*) or ("4E framework for Knowledge Dissemination and Utili#ation" or "engage, educate, execute and

	<p>evaluate") or (4MAT adj3 (system* or model*)) or (6-PACK adj3 framework*) or (approach adj3 "knowledge management") or (Behavior?r* adj3 "Ecological model*") or (Cabana adj8 (model* or framework*)) or (CAIMeR adj3 theor*) or (Caledonian adj4 model*) or (CAN-IMPLEMENT adj4 framework*) or (Change adj2 Theor*) or (Charles* adj4 framework*) or (co-KT adj3 framework*) or (Communication* adj2 theor*) or (Containment adj3 theor*) or (Crime adj2 theor* ) or (Deterr* adj3 theor*) or (Diffusion adj2 "Social Marketing") or (Diffusion adj2 theor*) or (diffusion adj6 "physical activity intervention*") or (E2D2 adj3 model*) or (Economic adj3 "conceptual framework*") or (Expectancy adj3 theor*) or (Fidelity adj2 Implementation) or (Fixsen* adj6 framework*) or (Implementation adj2 Stage*) or (implementation adj3 "disease management program") or (Implementation adj3 Drivers) or (Improvement adj2 model*) or (Instituti* adj2 theor*) or (Kirkpatrick* adj6 model*) or (Kotter adj4 change) or (LEAN adj3 framework*) or (Learning adj2 theor*) or (LOCK adj (framework* or model*)) or (Multilevel adj3 "Implementation framework*") or (organi#ation* adj2 theor*) or (Ottawa adj3 (model* or framework*)) or (Participat* adj3 "organi#ation* development") or (Payback adj3 framework*) or (PPRNet-TRIP adj3 model*) or (PRIME adj3 theor*) or (Priming adj2 theor*) or (Qualitative adj4 "Implementation framework*") or (Quality adj3 "Implementation framework*") or (Regulative adj2 Cycle) or (Resilience adj2 framework*) or (Routini#ation adj3 framework*) or (Socioecological adj2 model*) or (Stetler adj4 "Research Utili#ation") or (Stirman adj3 framework*) or (streams adj3 theor*) or (TCU adj3 model*) or (telemedicine adj3 "implementation model*") or (Triadic adj4 framework*) or (Tyler adj3 "collaborative model*") OR</p>
<p><b>Concept –</b> Generic Implementation theory, model and/or framework terms</p>	<p>"knowledge transfer" or (implement* adj3 intervention*) or (implement* adj3 "evidence base*") or (implement* adj3 approach*) or ((health or social) adj3 psycholog*) AND (framework* or theor* or model*)) AND</p>
<p><b>Context –</b> Veterinary Medicine</p>	<p>(exp chicken/ OR exp poultry/ OR exp pig/ OR exp bovine/ OR exp sheep/ OR exp goat/ OR exp horse/ OR exp donkey/ OR exp aquaculture/ OR exp cat/ OR exp dog/ OR exp Leporidae/ OR exp domestic animal/ OR exp livestock/ OR exp veterinary medicine/ OR exp animal health/ OR poultry OR chicken* OR pig OR pigs OR swine OR cow OR cattle OR sheep OR goat* OR horse* OR donkey* OR aquacultur* OR cat OR cats OR dog OR dogs OR rabbit* OR "domestic animal*" OR livestock OR "farm animal*" OR "production animal*" OR pet OR pets OR "companion animal*" OR "small animal*" OR veterinar* OR "animal health")</p>

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