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 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.syref.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), 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 (SPANA – 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?
   o Yes: exclude
   o Maybe or no: continue to question 4
4. Is the literature relevant to veterinary medicine?
   o Yes or maybe: continue to question 5
   o No: exclude
5. Is use of an implementation theory, model or framework used in the Methods or Results?
   o Yes or maybe: include
   o 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:

<table>
<thead>
<tr>
<th>Concept – Known Implementation theories, models and/or frameworks</th>
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<tbody>
<tr>
<td>(&quot;4E's Process theory&quot;) or (&quot;AACC5 framework*&quot; or &quot;Access, Align, Connect, Care, Sustain&quot;) or (&quot;Absorptive Capacity&quot;) or (&quot;Accelerating Improvement&quot; adj3 model*) or (&quot;Achieving Breakthrough Improvement&quot; adj3 model*) or (&quot;Action Learning Set Facilitation&quot;) or (&quot;Action model* of Consumption&quot;) or (&quot;action model*&quot; adj3 &quot;Cancer Survivorship&quot;) or (&quot;Action Research&quot;) or (&quot;Active Case finding&quot; adj3 model*) or (&quot;Active Implementation framework*&quot;) or (&quot;Adaptation Design and Impact&quot; adj3 model*) or (&quot;Adaptation in dissemination and implementation&quot;) or (&quot;adaptive implementation&quot; adj3 model*) or (&quot;Addiction Technology Transfer Center&quot; adj3 model*) or (&quot;Adherence model*&quot;) or (&quot;Adherence Optimisation&quot; adj3 framework*) or (&quot;Adult Learning&quot; adj3 Principle*) or (&quot;Adult Learning&quot; adj3 theor*) or (&quot;Advancing health disparities research within the health care system&quot;) or (&quot;Advancing Research and Clinical Practice Through Close Collaboration&quot; or (ARCC adj3 model*)) or (&quot;Affective Events&quot; adj3 theor*) or (&quot;African American faith setting*&quot; adj5...</td>
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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 ("Transaction Model* for Health Care Systems") or ("Transcultural model*" or framework*) or ("Transcultural model*" and implementation) or ("transformational change in health care systems") or ("translating evidence into practice") adj3 framework*) or ("translating evidence into action") adj3 framework*) 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 Behavio*r* Change") or ("Transtheoretical model* of Change") or ("Triadic Influence" adj3 theor*) or ("Triple P" adj3 framework*) or ("Understanding User Context") or ("University of Hawai”i Center for ‘Ohana adj6 "Self-Management of Chronic Illness"*) or ("Usable Innovation"*) or ("Utilization 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 ("Social Influence" adj2 "Self Efficacy") or ("Sustainability" adj4 (framework* or paradigm)) or ("Sustainability" adj4 "public health") and framework*) or ("Sustainability" adj4 "Noncommunicable Diseases") and framework*) or ("4E framework for Knowledge Dissemination and Utilization") or "engage, educate, execute and
<table>
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<tr>
<th>Concept – Generic Implementation theory, model and/or framework terms</th>
<th>&quot;knowledge transfer&quot; or (implement* adj3 intervention*) or (implement* adj3 &quot;evidence base&quot;) or (implement* adj3 approach*) or ((health or social) adj3 psychol*) AND (framework* or theor* or model*)) AND</th>
</tr>
</thead>
<tbody>
<tr>
<td>Context – Veterinary Medicine</td>
<td>(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 &quot;domestic animal*&quot; OR livestock OR &quot;farm animal*&quot; OR &quot;production animal*&quot; OR pet OR pets OR &quot;companion animal*&quot; OR &quot;small animal*&quot; OR veterinarian* OR &quot;animal health&quot;)</td>
</tr>
</tbody>
</table>

References:


Hamilton, Lindsay. 2018. 'Bridging the divide between theory and practice: taking a co-productive approach to vet-farmer relationships', *Food Ethics*, 1: 221-33.


Krasuska, Marta, and Thomas L. Webb. 2018. 'How effective are interventions designed to help owners to change their behaviour so as to manage the weight of their companion dogs? A systematic review and meta-analysis', *Preventive Veterinary Medicine*, 159: 40-50.


Moya, Sebastián, Kin Wing Chan, Stephen Hinchliffe, Henry Buller, Josep Esplugas, Bibiana Benavides, F. Javier Diéguez, Eduardo Yus, Giovanna Ciarrarino, Jordi Casal, Francisco Tirado, and Alberto Allepuz. 2021. 'Influence on the implementation of biosecurity measures in dairy cattle farms: Communication between veterinarians and dairy farmers', *Preventive Veterinary Medicine*, 190: 105329.


Ruston, Annmarie, Orla Shortall, Martin Green, Marnie Brennan, Wendela Wapenaar, and Jasmeet Kaler. 2016. 'Challenges facing the farm animal veterinary profession in England: A qualitative study of veterinarians' perceptions and responses', Preventive Veterinary Medicine, 127: 84-93.


