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Raising the (Roll)Bar:

Exploring Barriers and Facilitators to Research Translation in US Public Health

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Akademisk avhandling

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Abstract

Background

In public health, implementation science work is crucial to protecting the safety and health of populations. Despite this, such efforts have been extremely limited within the specific public health field of occupational safety and health. The overall aim of this thesis is to examine the concept of research translation, the barriers and facilitators that researchers have faced in translating research to the worker environment, and the process of scaling up an evidence-based agricultural safety program. Additionally, this study will provide an opportunity to adapt the clinically based Consolidated Framework for Implementation Research (CFIR), as well as the Proctor Taxonomy (of implementation outcomes), to occupational safety settings.

The implementation research conducted within this dissertation is focused on a case study in agricultural safety. With an annual fatality rate seven times higher than the all-worker fatality rate, agriculture is one of the most dangerous occupations to work in. Though nearly all aspects of farming can be considered dangerous, tractor overturns claim the greatest number of lives. Rollover protective systems (ROPS) are 99% effective in preventing death and disability in the event of an overturn when used with seatbelts. The ROPS Rebate Program was developed in 2006 to encourage the installation of retrofit ROPS in New York State and has been shown to be effective in this goal and in the long-term goal of reducing overturn fatalities. After expanding to six additional states, the National Tractor Safety Coalition was formed in order to facilitate the scaling up of the ROPS Rebate Programs. The National ROPS Rebate Program (NRRP) was formally announced in June 2017, though implementation of it is currently ongoing.

Methods: This dissertation is composed of five sub-studies which applied a mixed methods approach. Sub-study I consisted of a scoping literature review. Manuscripts were identified through six databases to explore how research translation is discussed among the research community. In addition, the review aimed at assessing the T0-T4 model of research translation (first developed by the National Institutes of Health) as it applies to agriculture, forestry, and fishing safety and health and used knowledge gained through the review to make modifications to this model.

To apply the CFIR and Proctor Taxonomy to agricultural safety settings (sub-study II), a survey was developed to assess the relevance of the constructs included in each framework to the NRRP implementation. The final survey was distributed to members of the National Tractor Safety Coalition. Using the results from this survey, quantitative and qualitative evaluation tools were developed.

Sub-study III utilized a repeat measure survey collected at four time points to capture changes in CFIR and Proctor constructs over time. Correlational analyses were conducted to compare each survey item to three outcome measures: state progress toward securing rebate funding for the Program, farmers intakes into the Program, and completed retrofits.

Thirteen individuals participated in qualitative research interviews for sub-study IV; nine of these individuals also participated in follow-up interviews. Interview guides were developed based on the survey results in sub-study III. Grounded Theory Situational Analysis was used to analyze each set of data.

Sub-study V was developed as a result of missing data from sub-studies III and IV. To conduct this analysis, media reports published about the ROPS Rebate Programs were collected. Discourse analysis for print media was used to assess the media reports in comparison to the ROPS Rebate Program trajectory in each state and nationally.

Results: Sub-study I led to the development of a modified T0-T4 research translation model, which takes into account the real-life challenges in moving proven innovations into widespread practice. The remaining sub-studies in this dissertation focused in the T3 phase of this model (widespread adoption). Sub-study II led to the identification of 21 CFIR and Proctor constructs that National Tractor Safety Coalition members believed would be important to the NRRP implementation. Sub-study III demonstrated that eight CFIR and Proctor constructs were highly correlated (rho $\geq$ 0.5) with at least one of the outcome measures (progress, intakes, or retrofits). Two primary themes were developed from the qualitative portion of the study (sub-study IV): 1) the implementation strategy evolved inconsistently across stakeholders, and 2) stakeholder engagement is a function of perceived feasibility and "small wins." Finally, sub-study V identified components of successful media strategies for implementation including diversity in actors and messages, timing, and frequency. In total, sub-studies III-V identified 27 CFIR and Proctor constructs that were relevant to the implementation of the NRRP, 10 of which were identified in more than one study.

Conclusions: This dissertation has served to examine, specifically, the implementation of the NRRP, and more generally, the field of implementation science as it applies to occupational safety and health. The methods applied in this study as well as the findings have resulted in: application of implementation frameworks to the field of agricultural safety and health, assessment of the unique challenges associated with initiatives to scale up innovations, assessment of implementation from the perspective of the CFIR and Proctor Taxonomy, and assessment of the use of media advocacy as an implementation strategy. The knowledge gained through this research will be helpful in improving the implementation of the NRRP and in developing implementation science efforts within the specific public health field of occupational safety and health.

Keywords: implementation science, research to practice, scale-up, Consolidated Framework for Implementation Research, Proctor taxonomy of implementation outcomes, evidence-based practices, stakeholder engagement, rollover protective systems, tractor overturns, farm safety, occupational safety, injury prevention

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