Assessing Pesticide Education Interventions using Kirkpatrick's Evaluation Model: A Narrative Literature Review

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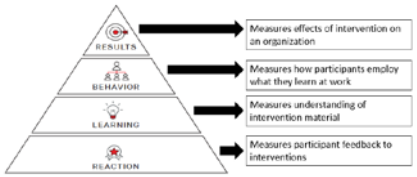
Introduction

- Pesticides are widely used in agriculture.[1]
- Many educational interventions have been developed to protect workers from hazards.[2,3]
- However, the methods used to assess the effectiveness of the intervention can vary.
- Kirkpatrick's Evaluation Model is a tool used to evaluate intervention outcomes and assign them ranks. Outcomes that show changes in behaviors and organizational changes show the intervention is more effective than those assessing reaction or knowledge changes.[4]

Goal: To assess pesticide education interventions to evaluate their effectiveness.

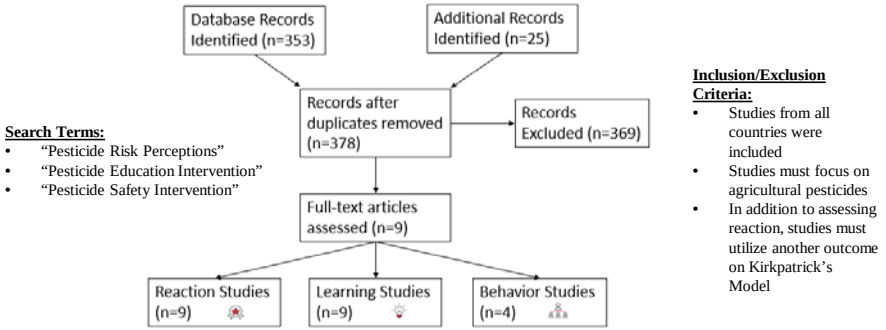


Methods

A narrative literature review was conducted using a PRISMA system to identify educational interventions.[5] Kirkpatrick's Model was used to rank the measured outcomes.[4]

Results

PRISMA Model



Search Terms:
- "Pesticide Risk Perceptions"
- "Pesticide Education Intervention"
- "Pesticide Safety Intervention"

Inclusion/Exclusion Criteria:
- Studies from all countries were included
- Studies must focus on agricultural pesticides
- In addition to assessing reaction, studies must utilize another outcome on Kirkpatrick's Model

Literature Selected and Kirkpatrick Ranking

Intervention Format	Sample Population	Content	Kirkpatrick's Ranking
Lay health advisors delivered content on reducing residential exposure	Female migrant farmworkers in the US	Residential exposure	★ 💡
Urine, foliage and skin patch samples were collected following EPA pesticide training	US farming communities	Take-home exposure	★ 💡 🏢
Researchers promote safe pesticide practices and reduce misuse	Nepalese farmers/farmworkers	Pesticide application practices	★ 💡
Researchers discuss adverse risks associated with organophosphate (OP) exposure and examined urine for OP exposure	Chilean children/parents	Risk perception and exposure to organophosphate	★ 💡 🏢
Community-based system to decrease pesticide misuse through surveys, workshops and community meetings	Ecuador farming households	Pesticide sources and general chemical safety	★ 💡 🏢
Researchers delivered content on pesticide application safety pracitices and observed safety behaviors	Egyptian male adolescent pesticide applicators	Proper pesticide safety techniques	★ 💡 🏢
Researchers delivered content on pesticide poisonings	Indian farmers	Occupational poisoning prevention	★ 💡
Researchers delivered content on pesticide safety to reduce pesticide risks	Migrant farmworkers in the US	Pesticide sources and general chemical safety	★ 💡
Researchers delivered content on prevention of suicide by pesticide poisonings	Sri Lankan pesticide vendors	Suicide/pesticide poisoning and high-risk customers	★ 💡

Conclusions

- Most intervention studies included outcomes measures that only assessed reactions and knowledge to the training
- Similarities between studies included mitigating pesticide exposure and measuring results through pre- and post- examinations and behavioral observations to test program effectiveness
- Differences among interventions demonstrate how various outcome measures can be employed to address workplace hazards
- No articles included an outcome measure looking at changes at the organizational level

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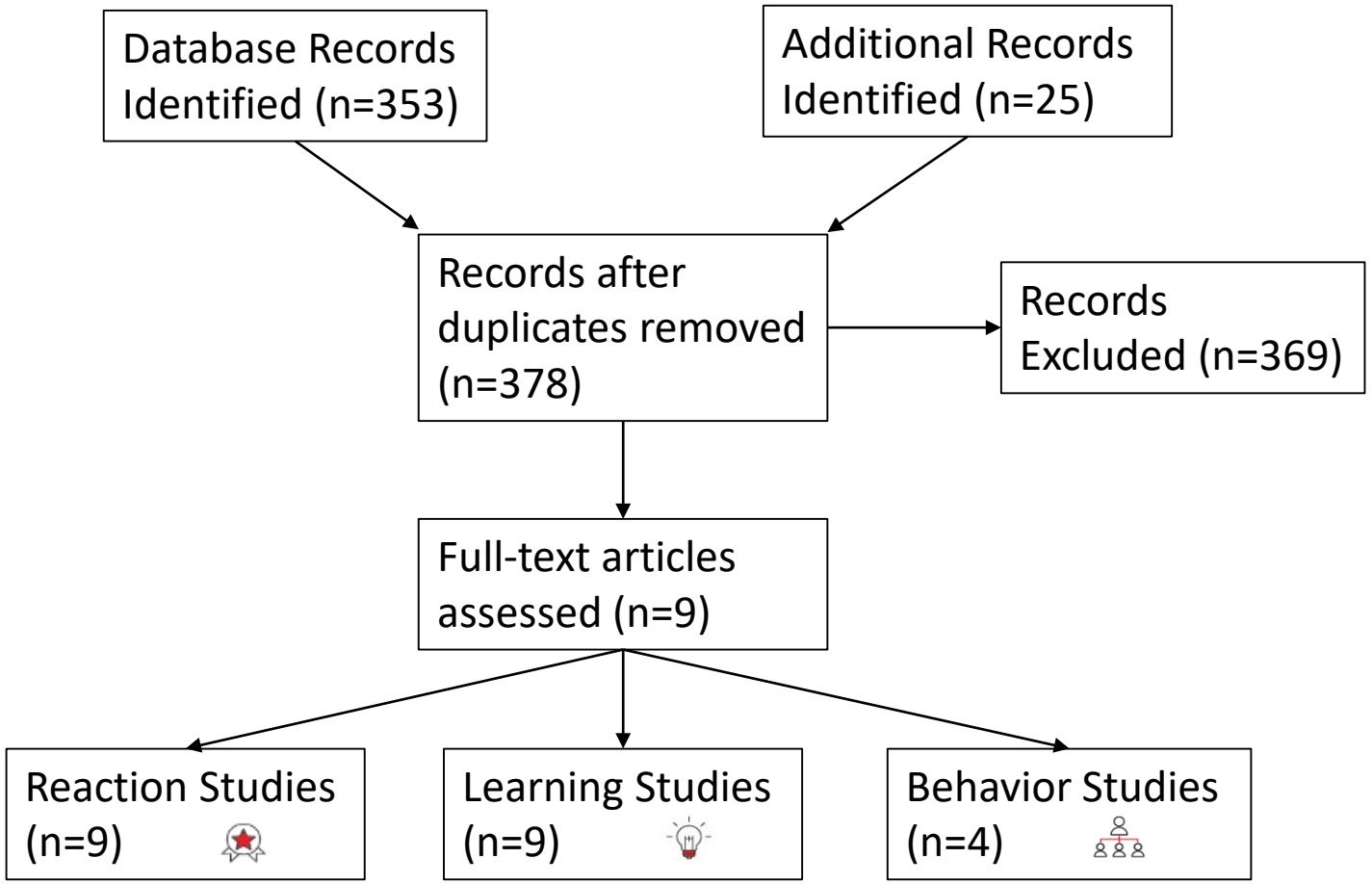
References available upon request.

PRISMA MODEL



Kirkpatrick Model of Evaluation