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To cite this article: Bryan Weichelt, Kang Namkoong, Rudy Sunrin Kim, Rick Burke, Burney Kieke & Roger Aby (2026) Unveiling the Effect of Repeated Exposure to Agricultural Injury News: A Randomized Controlled Trial, Journal of Agromedicine, 31:1, 139-148, DOI: 10.1080/1059924X.2025.2581237

To link to this article: <https://doi.org/10.1080/1059924X.2025.2581237>



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Published online: 31 Oct 2025.



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Unveiling the Effect of Repeated Exposure to Agricultural Injury News: A Randomized Controlled Trial

Bryan Weichelt ^a, Kang Namkoong^b, Rudy Sunrin Kim^b, Rick Burke^c, Burney Kieke^d, and Roger Aby^a

^aNational Farm Medicine Center, Marshfield Clinic Research Institute, Marshfield, WI, USA; ^bDepartment of Communication, University of Maryland, College Park, MD, USA; ^cBureau of Occupational and Environmental Health, Wisconsin Department of Health Services, Madison, WI, USA; ^dClinical Epidemiology & Population Health, Marshfield Clinic Research Institute, Marshfield, WI, USA

ABSTRACT

Objectives: Agriculture is one of the most dangerous industries in the United States, especially for children. Despite considerable efforts to develop and implement interventions that protect children, the burden of agricultural injury and disease remains a stubborn and multifaceted public health concern. This study examined the effects of repeated exposure to agricultural injury news on farm parents' risk perception and behavioral intentions for farm safety practices. The study also examined the roles of existing self- and response-efficacy in the effect of agricultural injury news consumption on behavioral intention.

Methods: In 2021 and 2022, the study team conducted a field experiment where farm parents were randomly assigned to an intervention group (reading weekly child agricultural injury news articles for 4 weeks) and a control group (reading weekly non-injury "farm life" articles for 4 weeks). Participants completed online pre- and post-test surveys before and after intervention. The PROCESS model was employed to test research hypotheses, and 162 participants were included in the analyses.

Results: The results showed that repeated exposure to agricultural injury news increased farm parents' perceived severity of agricultural incidents; in turn, perceived severity enhanced their behavioral intention to adopt agricultural safety practices. The partial moderated mediation analysis shows that the indirect effect of perceived severity between repeated news exposure and behavioral intention to adopt farm safety practices were not dependent on farm parents' levels of self- and response-efficacy.

Conclusion: These results imply that agricultural injury news consumption could be a viable intervention to reduce U.S. childhood agricultural injury and fatality. Findings may also lead to additional lines of research, including similar testing with different groups of agricultural stakeholders, expansion to adults, and safety intervention research for other industries.

KEYWORDS

Agricultural injury news; agricultural safety; behavioral intention; farm children; farm parents; risk perception

Introduction

Agriculture is one of the most dangerous industries in the United States and still the only hazardous occupation allowing children to be in an active worksite.¹ Unsurprisingly, the agricultural sector presents a significant danger to children and adolescents as it contributes to close to half of all fatalities among the population.^{2,3} According to the National Children's Center for Rural and Agricultural Health and Safety,⁴ a child dies from an agricultural accident every 3 days, and 33 children are injured daily. Among young workers, the number of fatal injuries in agriculture was higher than in all other industries combined,⁴ showing

the hazardous nature of farm environments. Furthermore, it is estimated that up to 88% of agriculture-related incidents are not reported, suggesting that agricultural injuries involving children may be much higher⁵; other scholars have reported similar findings in recent years.⁶

Due to the nature of farms that can double as a workplace and living environment,⁷ farm parents play a crucial role in addressing agricultural safety concerns related to their children.⁸ To implement safe practices on farms, parents should first recognize the danger of, and their susceptibility to, agricultural incidents and go on to voluntarily adopt safety measures in their everyday lives on

CONTACT Bryan Weichelt  Weichelt.bryan@marshfieldresearch.org  National Farm Medicine Center, Marshfield Clinic Research Institute, 1000 N Oak Ave, Marshfield, WI 54449, USA; Kang Namkoong  namkoong@umd.edu  Department of Communication, University of Maryland, 2126 Skinner Building, College Park, MD, 20742, USA

This article has been corrected with minor changes. These changes do not impact the academic content of the article.

 Supplemental data for this article can be accessed online at <https://doi.org/10.1080/1059924X.2025.2581237>

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the farm.² Research on fear appeal suggests that reading news reports on childhood agricultural incidents could enhance parents' farm safety practices for their children because the injury news exposure could make farm parents perceive threats, which could lead to adopting safety behaviors.⁹ Moreover, reading detailed news accounts of actual childhood agricultural injuries or deaths could also lead to cognitive identification with a victim(s) and elicit empathic responses, which could make them modify their perspectives about children's roles and environment in their daily practice on their farms. Thus, to enhance farm children's safety outcomes, this study examines if and how repeated exposure to agricultural injury news about farm children could improve their parents' behavioral intention to adopt safety practices for their children and others on their farm.

Agricultural injury news consumption and the Extended Parallel Process Model (EPPM)

Media contents provided by social and traditional mass media have been significant sources of second-hand experiences about agricultural incidents for farm parents.⁸ Childhood agricultural incidents remind farm parents of the dangerous nature of their lives, allowing them to connect the mediated experiences to their real-life experiences. Therefore, exposure, especially repeated exposure, to news reports on childhood agricultural incidents and injuries may arouse a series of emotional responses, such as sadness about the victims and their families and fear about allowing their children to work or play on a farm. This may increase farm parents' perceived threat of having their children on their farm and could lead to an increase in behavioral intention to adopt agricultural safety behaviors.

Witte's Extended Parallel Process Model (EPPM)⁹ provides a solid theoretical framework to examine the effects of reading traumatic agricultural news on perceived threat and subsequent behavioral changes. Introduced in 1992, the EPPM incorporates and expands Leventhal's parallel process model¹⁰ and Rogers' protection motivation theory¹¹ to explain human behaviors in response to fear appeal stimuli. Fear appeals are persuasive

messages that emphasize risky behaviors that could cause harm.

EPPM defines two predictive factors in the fear appeal effect: perceived efficacy and perceived threat. Each efficacy and threat perception consists of two distinct but related concepts. Perceived efficacy is comprised of response efficacy and self-efficacy. Response efficacy refers to a person's belief as to whether a response effectively prevents the threat, and self-efficacy is defined as a person's belief in their ability to perform the recommended response.⁹ The perceived threat consists of two aspects: *perceived susceptibility*, which refers to how vulnerable individuals believe they are to a particular threat (i.e., a person's beliefs about the chances of experiencing the danger), and *perceived severity*, which concerns the expected level of harm the threat may cause (i.e., a person's beliefs about the seriousness of the danger).^{9,12}

While past fear appeal research focused mainly on factors leading to intended effects, the EPPM also considers factors associated with fear appeal failures, unintended effects, and successes.¹³ According to the EPPM, the degree to which individuals feel threatened by the message directly affects whether they decide to respond to the message or not.¹⁴ Thus, when people are presented with a fear appeal message, they first appraise the threat of the depicted hazard (i.e., perceived susceptibility and severity). If the threat is insignificant, individuals will do nothing in response to the fear message. This is the first type of reaction referred to as *non-responses*. When the threat is perceived as serious, people evaluate the efficacy of the recommended responses (i.e., response efficacy) and decide to control either the danger or the fear.¹² If their perceived response efficacy is greater than the perceived threat, and their perceived self-efficacy is high, they tend to take danger control processes by complying with the behavior suggested by the message.^{12,14} However, suppose people believe the recommended responses are ineffective (i.e., low perceived response efficacy), or they believe they are incapable of performing the responses (i.e., low perceived self-efficacy). In that case, they try to control their fear, not the danger, by avoiding the fear appeal messages.¹³

The EPPM is commonly used in health communication campaign research to examine the effects of fear appeals on behavioral changes. Research findings demonstrate the effectiveness of fear appeals across a wide range of health domains, including substance use, sexual health, dental hygiene, disease prevention, and overall safety.⁹ For example, past literature in domains such as cardiovascular health¹⁵ and infectious diseases like COVID-19¹⁶ has highlighted fear appeals to be effective in promoting health behavior. A study on workplace safety messages found perceived severity, susceptibility, and self-efficacy to have positive effects on behavioral intention.¹⁷

It is noteworthy that the application of EPPM is not limited to communication campaign research that focuses on the effects of persuasion. EPPM has also been employed to investigate the impact of television health news that usually does not have explicit persuasive intent. For example, Hong¹⁸ found that health awareness induced by television news reports had positive impacts on perceived severity, response efficacy, and self-efficacy, and in turn, these three mediators enhanced message acceptance.

In addition, past research tested the fear-inducing stimuli effects in the context of agricultural safety. Smith et al.,¹⁹ for instance, examined the effectiveness of fear-appeal brochures to increase the use of hearing protection in farmers, employing the EPPM as the main theoretical framework. They found fear appeal messages significantly affected the farmers' behavioral intention to use hearing protection. Witte et al.²⁰ found farmers with high threat and high efficacy perceptions regarding farm equipment injuries had the most positive attitudes toward safety measures and the strongest intentions and behavior toward using safety measures.

Based on EPPM and past research on fear-inducing message effects, this study team hypothesized that agricultural injury news consumption would influence participants' perceived susceptibility and severity, and in turn, the perceived threat would enhance behavioral intentions for safety practices. Our formal hypotheses are as follows:

H1: Farm parents who read childhood agricultural injury news will perceive higher severity (H1a) and susceptibility (H1b) about farm-related injury incidents than those who read news covering ordinary farm life stories.

H2: Farm parents who read childhood agricultural injury news will higher level of behavioral intention to adopt farm safety practices than those who read news covering ordinary farm life stories.

H3: Perceived severity (H3a) and perceived susceptibility (H3b) about farm-related injury incidents will be positively associated with behavioral intention to adopt farm safety practices.

Reading agricultural injury news could increase knowledge about the causes and consequences of specific incidents, and the increased knowledge about the risk factors could enhance self and response efficacy and eventually contribute to promoting agricultural safety practices. However, most agricultural injury news articles seldom offer specific safety guidelines to prevent agricultural injuries. Therefore, readers can learn about the incidents rather than about safety practices to prevent the incidents, which may not enhance self- and response-efficacy. EPPM also implies fear appeals might work differently according to the message receivers' levels of self- and response-efficacy. In other words, it depends on efficacy perception whether they take a danger control process (i.e., accepting the recommended behavior) or a fear control process (i.e., avoiding the fear message).

In this sense, self-efficacy has been identified as a moderator, not a mediator, between perceived susceptibility and disaster preparedness for university employees, showing more preparedness behavior when self-efficacy was high.²¹ Mou et al.²² also found the moderating effect of self-efficacy between perceived severity and susceptibility and behavioral intention. In addition, in college students' use of online mental health services, the relationship between perceived severity and trust in the services was more prominent for students with higher levels of self-efficacy.²³ Thus, this study investigates the moderating roles of self

and response efficacy in the relationship between perceived threat and behavioral intention.

Research Question 1. How, if at all, do self-efficacy and response-efficacy moderate the relationship between perceived threat (perceived severity and perceived susceptibility) and behavioral intention to adopt farm safety practices?

Methods

The study team conducted a field experiment where farm parents were randomly assigned to an intervention group that read weekly news articles of childhood agricultural injury incident reports, or a control group who read farm life articles that were not focused on health and safety. The intervention was designed to increase participants' risk perception about agricultural incidents and influence subsequent safety behaviors. Participants completed online surveys before and after reading the weekly news articles for four weeks. The news articles were derived from online news sources and were embedded in the study's online surveys. Each of the four news articles in the intervention group described fatal injury events. Two of those reported toddler-aged victims, one who drown in an icy farm pond and the other was run over by a skid steer operated by the child's older brother. The two other articles involved teenaged victims; one who was fatally injured in a machine shed and the other the result of an ATV crash in an orchard.

Participants were recruited using paid advertisement campaigns on Facebook.com via the Meta Business Suite from September 2021 to February 2022.²⁴ The Facebook (now Meta) ads were hosted through the Facebook page of the National Children's Center for Rural and Agricultural Health and Safety (NCCRAHS). Farm parents aged ≥ 18 and employed in the agricultural industry, with at least one child under age 18, were eligible for this study. Based on the results of a screener survey, a total of 271 eligible participants were invited to the field experiment. Out of the 271, 265 consented to the pre-test questionnaire, and 163 completed the full study, yielding an overall attrition rate of 38.5% and a dropout rate of 39.9%. Due to drop off in study enrollment, later participants were assigned to the experimental

group (Intervention Group = 109; control group = 54). Participants were compensated \$50 (USD) for the full completion of the study, answering pre- and post-test surveys and four short weekly surveys that required reading news articles.

Measures

The pre-test questionnaire included personal, family, and farm demographics. Mediators (perceived susceptibility and perceived severity), moderators (self-efficacy and response-efficacy), and the dependent variable (behavioral intention) were measured by asking participants to indicate their level of agreement on 7-point Likert-type scale items ranging from 1 (Strongly Disagree) to 7 (Strongly Agree). Items employed to measure each variable were listed in Appendix 1. In the mediation analyses, mediators and dependent variables were difference scores calculated by subtracting pretest scores from posttest scores.

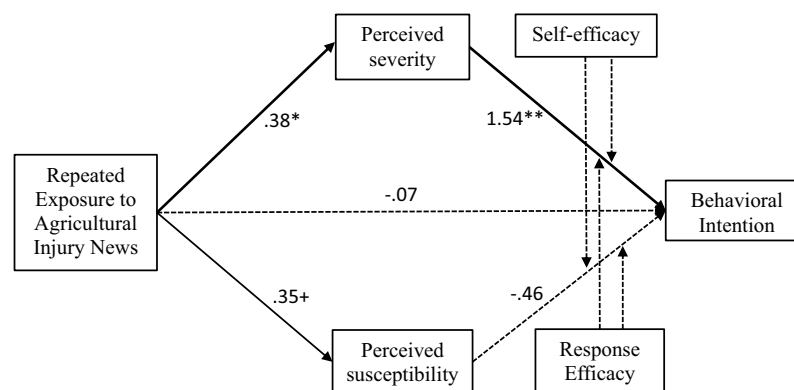
Results

Participants' age ($M = 45.15$, $SD = 7.02$) and gender (82.8% of respondents were female) were assessed in the pretest survey and included as control variables in our model. All participants self-identified themselves as farm parents. While all participants lived on a farm, 68 (41.7%) worked full-time, and 30 (24.5%) worked part-time or seasonally on the farm. Table 1 presents participants' levels of self- and response-efficacy, risk perception (i.e., perceived susceptibility and perceived severity) and behavioral intention to adopt farm safety practices.

To test hypotheses and address the research question stated above, we ran a moderated mediation model, including the intervention variable (0 = control group, 1 = intervention group) as an independent variable, perceived severity and perceived susceptibility as mediators, self-efficacy and response-efficacy as moderators, and behavioral intention to adopt farm safety practices as a dependent variable (Figure 1). We employed PROCESS macro²⁵ (Model 16) to conduct the moderated mediation analysis. Table 2 presents correlations among the variables included in the mediated moderation model.

Table 1. Descriptive statistics of the variables in the moderated mediation model.

	Time	Group	M	SD	N	α
Self-efficacy	Pretest	Control	6.19	0.62	54	.88
		Experiment	5.96	0.97	109	
		Total	6.04	0.87	163	
Response-efficacy	Pretest	Control	5.78	0.83	54	.74
		Experiment	5.58	0.98	109	
		Total	5.64	0.94	163	
Perceived Severity	Pretest	Control	5.69	0.80	54	.89
		Experiment	5.32	1.16	108	
		Total	5.45	1.07	162	
	Posttest	Control	6.13	0.78	54	
		Experiment	6.11	0.86	108	
		Total	6.12	0.83	162	
Perceived Susceptibility	Pretest	Control	4.55	1.16	54	.77
		Experiment	4.19	1.11	109	
		Total	4.31	1.14	163	
	Posttest	Control	3.92	1.17	54	
		Experiment	3.91	1.25	109	
		Total	3.92	1.22	163	
Behavioral Intention	Pretest	Control	5.80	0.94	54	.81
		Experiment	5.51	1.00	109	
		Total	5.61	0.99	163	
	Posttest	Control	6.06	0.85	54	
		Experiment	5.81	0.89	109	
		Total	5.89	0.88	163	

**Figure 1.** The moderated mediation model of repeated exposure to agricultural injury news.

The first hypothesis predicted farm parents who read childhood agricultural injury news would perceive higher severity (H1a) and susceptibility (H1b) than those who read news covering farm life stories. The a-path from the experiment conditions to perceived severity was significant (Unstandardized Beta (B) = .380, Standard Error (SE) = .182, $t = 2.088$, $p = .038$, 95% CI = [.021, .739]), but the a-path to perceived susceptibility

was not (B = .345, SE = .194, $t = 1.786$, $p = .076$, 95% CI = [-.037, .728]). The results show repeated exposure to agricultural injury news on children was positively associated with the changes in perceived severity, not with perceived susceptibility. Thus, H1a was supported, while H1b was not.

The second hypothesis predicted farm parents who read childhood agricultural injury news would be more willing to adopt farm safety

Table 2. Correlation coefficients among the variables in the moderated mediation model.

	Group	Self-efficacy	Response-efficacy	Perceived Severity	Perceived Susceptibility	Behavioral Intention
Group	–					
Self-efficacy (pretest)	–.128	–				
Response-efficacy (pretest)	–.101	.311***	–			
Perceived Severity (diff.)	.151+	–.075	–.066	–		
Perceived Susceptibility (diff.)	.141	–.045	–.069	.083	–	
Behavioral Intention (diff.)	.020	–.174*	–.263***	.139+	.130+	–
N	163	163	163	162	163	163

Notes. Group: Control (= 0) and Experiment (= 1); + < .1, * < .05, ** < .01, *** < .001.

practices than those who read news covering farm life stories. The c-path from the experiment conditions to behavioral intention was not significant, indicating repeated exposure to agricultural injury news on children was not associated with participants' willingness to adopt safety practice (Unstandardized Beta (B) = –.071, Standard Error (SE) = .151, $t = -1.473$, $p = .637$, 95% CI = [–.370, .227]). Thus, H2 was not supported.¹

The third hypothesis predicted that perceived severity (H3a) and perceived susceptibility (H3b) would be positively associated with behavioral intention to adopt farm safety practices. Between the two perceived threat variables, perceived severity was positively associated with behavioral intention to adopt agricultural safety practices (B = 1.538, SE = .564, $t = 2.726$, $p = .007$, 95% CI = [.423, 2.653]), supporting H3a, but not perceived susceptibility (B = –.464, SE = .449, $t = -1.035$, $p = .302$, 95% CI = [–1.351, .422]).

The indices of partial moderated mediation effect were not statistically significant for both mediation paths (Indirect effect [Intervention > Perceived severity > Behavioral intention] Self-efficacy: index = .070, SE = .057, 95% Confidence Interval (CI) = [–.032, .193]; Response efficacy: index = –.041, SE = .049, 95% CI = [–.161, .031]; Indirect effect [Intervention > Perceived susceptibility > Behavioral intention] Self-efficacy: index

= –.052, SE = .049, 95% CI = [–.154, .041]; Response efficacy: index = –.038, SE = .029, 95% CI = [–.100, .012]). This shows the indirect effects of perceived threats between the intervention and behavioral intention are not dependent on the participants' self and response efficacy. For the full PROCESS model results see Table 3.

Discussion

This study explored if and how farm parents' risk perception (i.e., perceived susceptibility and severity) and their behavioral intention to adopt safety practices for their children could be influenced. It also examined the moderating roles of existing self- and response-efficacy in the effect of agricultural injury news consumption on behavioral intention. The results have demonstrated that parents who read about childhood agricultural injury news perceive higher levels of severity to childhood agricultural incidents; in turn, the perceived severity can enhance parents' willingness to adopt safe farm practices, while these effects were not dependent on people's existing levels of self- and response-efficacy.

These findings are well aligned with the past literature on the relationship among fear-induced messages, perceived threats, and behavioral change. Perceived threat has been regarded as a major predictor of health behavioral changes.

¹We also conducted a repeated-measure ANOVA to test the main effects of repeated exposure to agricultural injury news, testing H1s and H2. The between-subject variable was the experimental condition (coded: 0 = control group, 1 = intervention group), and the within-subject variables were participants' risk perception (i.e., perceived susceptibility and perceived severity) and behavioral intention to adopt farm safety practices. Similar with the results of the PROCESS moderated mediation model presented in the result section, the changes in perceived severity and perceived susceptibility between pre- and post-tests were larger for those who read agricultural injury news on children (i.e., experiment condition) than those who read farm life articles (control condition) (perceived severity: $F(1, 161) = 4.58$, $p = .034$, $\eta^2 = .03$; perceived susceptibility: $F(1, 161) = 3.44$, $p = .065$, $\eta^2 = .02$). Thus, H1a is supported, while H1b was marginally support. However, there was no difference between the control and experimental groups regarding the behavioral intention change between pre- and post-tests, $F(1, 161) = .12$, $p = .728$, $\eta^2 = .001$. That is, there was no direct effect of reading childhood agricultural injury news on participants' willingness to adopt farm safety practices; thus, H2 was not supported.

Table 3. Regression results for the a-paths from iv to med and for the b-path from med to dv.

Variable	Model a-paths						Model b/c-paths		
	Perceived Severity			Perceived Susceptibility			Behavioral Intention		
	b	SE	P	b	SE	P	b	SE	P
Group	.380	.182	.038	.345	.194	.076	-.071	.151	.637
Perceived severity							1.538	.564	.007
Perceived susceptibility							-.464	.449	.302
Self-efficacy							.171	.122	.164
Interaction 1							-.137	.083	.103
Interaction 2							.203	.089	.024
Response-efficacy							-.155	.107	.151
Interaction 3							-.100	.070	.151
Interaction 4							-.118	.083	.156
Age	.001	.012	.941	.008	.013	.526	-.013	.010	.219
Gender	.285	.199	.154	.139	.212	.514	-.053	.164	.749

Notes. $N = 162$; Number of bootstrap samples = 5000.

^aPerceived severity, perceived susceptibility, and behavioral intention were difference scores calculated by subtracting pretest scores from posttest scores.

^bSelf-efficacy and response-efficacy were measured at the pretest.

^cInteraction 1 = Perceived severity * Self-efficacy ($\Delta R^2 = .015$, $F(1,150) = 2.686$, $p = .103$).

^dInteraction 2 = Perceived susceptibility * Self-efficacy ($\Delta R^2 = .028$, $F(1,150) = 5.193$, $p = .024$).

^eInteraction 3 = Perceived severity * Response-efficacy ($\Delta R^2 = .011$, $F(1,150) = 2.081$, $p = .151$).

^fInteraction 4 = Perceived susceptibility * Response-efficacy ($\Delta R^2 = .011$, $F(1,150) = 2.029$, $p = .156$).

^gModel for the a-path (perceived severity) $R^2 = .035$, $F(3, 158) = 1.925$, $p = .128$.

^hModel for the a-path (perceived susceptibility) $R^2 = .022$, $F(3, 158) = 1.202$, $p = .311$.

ⁱModel for all paths: $R^2 = .184$, $F(11, 150) = 3.079$, $p = .001$.

In other words, people would only change or even consider modifying their behaviors if they perceive a certain level of threat from health or safety issues. In addition to the EPPM, the Health Belief Model (HBM)²⁶ identifies perceived threat as one of the key factors that influence the adoption of certain health behaviors. It is argued that individuals are more likely to engage in the recommended behavior if they believe a health threat is expected to affect them and pose a significant danger.^{27,28}

One of the key contributions of this article is its focus on self-efficacy and response-efficacy in the fear appeal process. Response efficacy refers to a person's belief as to whether a response effectively prevents the threat, and self-efficacy is defined as a person's belief in their ability to perform the recommended response.⁹ Both self-efficacy and response-efficacy are predictive factors in the fear appeal effect as defined by the EPPM. Even though self-efficacy and response-efficacy do not significantly moderate the relationship between perceived threat and behavioral intention in this study, the results of this study lay potential additional research directions. For example, future research could investigate whether combining safety simulation trainings or participatory workshops with fear appeal effects

could increase perceptions of self-efficacy and response-efficacy, or if these effects might be influenced by pre-existing levels of self-efficacy and response-efficacy.

Generally, it has been considered a challenging task to persuade parents to change their safety practices, especially in regard to cultural and familial traditions such as farming and ranching. It is well known that farm parents play an essential role in addressing safety concerns on their farms and ranches, where children often grow up around the many hazards of the industry, including large animals and machinery. When examining safety perceptions, farm parents tend to overestimate the safety of agriculture relative to other industries and, conversely, have a strong confidence in their knowledge of farm safety and their ability to provide supervision.²⁹ Moreover, scholars have found that very often parents' perceived adequate supervision still resulted in injuries, including in a study by Morrongiello, et al,³⁰ where researchers found in 34% of analyzed medically attended cases, the child was in what would be considered adequate adult supervision (available, proximal, and continuous) at the time of their injury. Similarly, Nilsson² reported farm parents depend on a trial-and-error approach for their children regarding

safety on the farm. Parents' approach to safety education and children's inclination to model risky behaviors from their surroundings reinforce the inherent risks in farm environments. Therefore, our findings, especially the effects of agricultural injury news consumption on perceived severity and its indirect impact on intention to adopt safety practices, indicate agricultural injury/fatality reports and corresponding databases, such as AgInjuryNews.org, could be viable components of agricultural safety interventions for farm parents.

Limitations

Before a conclusion, we acknowledge some of the limitations of this study. First, there was a discrepancy in the number of participants between the control group ($n = 54$) and intervention group ($n = 109$) due to the original study design and lagging recruitment rates – additional analysis was planned only using the intervention group. The sample size disparity had a limited but notable impact on testing the intervention effects as well as the theoretical model proposed in this study. Second, some of the results, particularly the moderated mediation analyses, may not be statistically significant due to insufficient power. Post hoc power analyses² indicate that our experiment lacked adequate statistical power to detect small effects, although it was sufficient for identifying moderate and large effects. This lack of power could also be attributed to the relatively small effect sizes observed in our findings. Therefore, future research should address power considerations during the experimental design stage. Third, we employed a non-probability sampling strategy to recruit participants, which limits the generalizability of our findings. Farm parents who chose to participate in our study may have a greater interest in farm safety issues and are likely more exposed to news about agricultural injury in their daily lives compared to those who saw our study

advertisement but opted not to participate. This may be also associated with the lower power to detect small effects. Therefore, it is important to interpret our study findings with the understanding that our sample is not represent the broader population. Fourth, we recognize that a significant majority of our study participants were farm mothers (82.8%). This may not accurately represent the overall workforce on farms, where men outnumber women. Future research needs to recruit more farm fathers, although farm mothers play a crucial role in influencing their family members and promoting safety behaviors among their children on the farm. Finally, the primary outcome of this study is the change in behavioral intention, not actual behavior. We acknowledge that changes in behavioral intention do not guarantee behavioral change, which should be the ultimate goal of a safety education intervention. However, a great deal of behavioral science research indicates that behavioral intention is one of the strongest predictors of actual behaviors. Thus, this study could provide solid empirical evidence for future research on agricultural injury news effects on safety behavior changes as we continue to report on long-term responses from participants in this ongoing study.

Conclusion

Agriculture is an old, diverse, and evolving industry producing food, fuel, and fiber and providing the very economic foundation on which many rural communities are built. The industry also prides itself on innovation and technological advancement, and while there have been considerable efforts to develop and implement interventions that protect children from agricultural diseases and injuries, injury rates of workers and bystanders remain stubbornly high. Yet, voluntary adoption of on-farm safety measures is still limited, particularly among small farms, which make up more than 90% of U.S. operations.

²We conducted post hoc power analyses to assess the degree of reliability of our findings.³¹ Using a software package, Gpower3.1, we calculated power in multiple regression using alpha level (.05), sample size (163), and number of predictors ($H1$ and $H2 = 3$; $H3 = 5$; $RQ1 = 7$). Following Cohen's criteria,³¹ we predetermined the weak ($f^2 = .02$), medium ($f^2 = .15$), and large effect size ($f^2 = .35$).³² The results are following: $H1$ and $H2$: $f^2 = .02$, power = 0.290; $f^2 = .15$, power = .991; $f^2 = .35$, power = 1.00, $H3$: $f^2 = .02$, power = 0.232; $f^2 = .15$, power = .979; $f^2 = .35$, power = 1.00, and $RQ1$: $f^2 = .02$, power = .199; $f^2 = .15$, power = .964; $f^2 = .35$, power = 1.00.

Given agricultural diseases and injury rates remain high, using varied information sources such as social and traditional media as a means to change farm parent behavior toward safety practices can be a promising pathway to address agricultural safety and health issues.

Social and traditional media news reports are a consistent information source for farmers. Determining the effectiveness of these information sources and farmers' and parents' responses to them in reducing childhood agricultural injury provides a novel and growing avenue for change. This study investigated the underlying mechanism of the effect of agricultural injury news consumption on farm parents' behavioral intention, showing the roles of risk and efficacy perceptions in the relationship based on the EPPM. The findings show that repeated exposure to agricultural injury news could enhance farm parents' risk perception and, more importantly, their behavioral intentions to adopt safety practices. These results demonstrate that agricultural injury news consumption may be a viable safety education intervention to reduce childhood agricultural injury and fatality. This study may also lead to additional lines of research, including similar testing with different groups of agricultural stakeholders, different news delivery methods and platforms, and/or replicability across other industries or countries.

Overall, applying the fear appeal concept within a mediated context represents an innovative application of the EPPM. However, the relatively small effects observed with the perceived severity warrant additional investigation into the types of narratives and safety measures included in the news reports. Future research should aim to validate these findings across different groups of agricultural stakeholders and safety intervention research for other industries and explore innovative media formats, such as videos, radio, or interactive tools, to improve the effectiveness of such interventions. Expanding the findings of this study can help public health professionals and agricultural safety advocates better leverage social and traditional media to address rural and agriculture safety and health concerns.

Disclosure statement

No potential conflict of interest was reported by the author(s).

Funding

Funding support was provided through the National Children's Center for Rural and Agricultural Health and Safety through the National Institute for Occupational Safety and Health Cooperative Agreement U54 OH009568.

ORCID

Bryan Weichelt  <http://orcid.org/0000-0001-7444-4374>

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