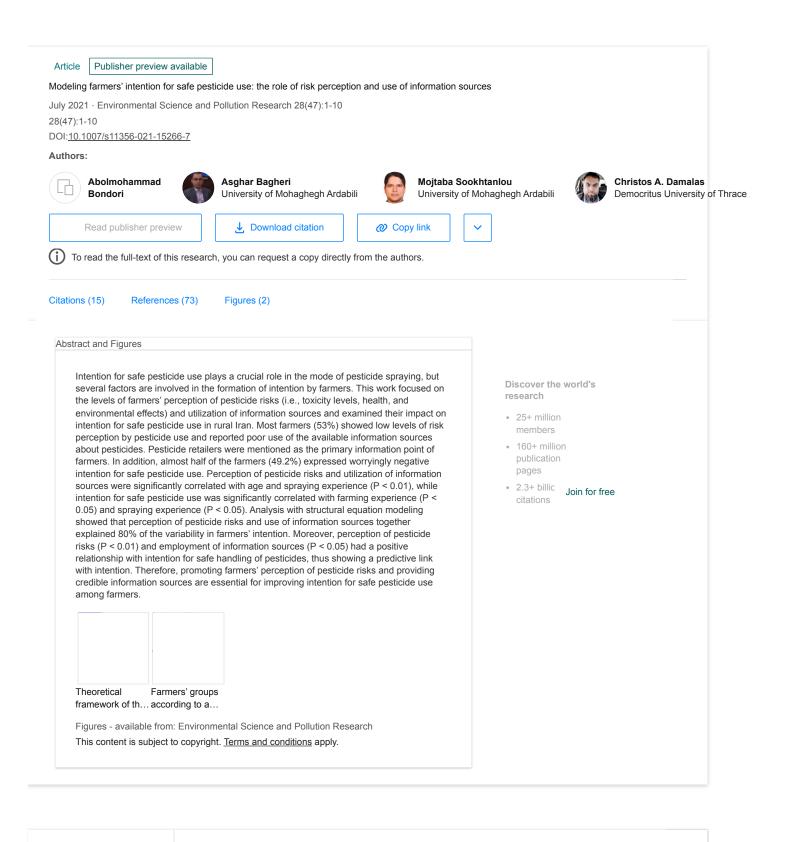
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Environmental Science and Pollution Research (2021) 28:66677–66686 https://doi.org/10.1007/s11356-021-15266-7

RESEARCH ARTICLE

Modeling farmers' intention for safe pesticide use: the role of risk perception and use of information sources

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Received: 28 April 2021 /Accepted: 28 June 2021 / Published online: 7 July 2021 © The Author(s), under exclusive licence to Springer-Verlag GmbH Germany, part of Springer Nature 2021

Abstract

Intention for safe pesticide use plays a crucial role in the mode of pesticide spraying, but several factors are involved in th formation of intention by farmers. This work focused on the levels of farmers' perception of pesticide risks (i.e., toxicity levels health, and environmental effects) and utilization of information sources and examined their impact on intention for safe pesticid use in rural Iran. Most farmers (53%) showed low levels of risk perception by pesticide use and reported poor use of the availabl information sources about pesticides. Pesticide retailers were mentioned as the primary information point of farmers. In additior almost half of the farmers (49.2%) expressed worryingly negative intention for safe pesticide use. Perception of pesticide risk and utilization of information sources were significantly correlated with age and spraying experience (P < 0.01), while intentio for safe pesticide use was significantly correlated with farming experience (P < 0.05) and spraying experience (P < 0.05) Analysis with structural equation modeling showed that perception of pesticide risks and use of information sources togethe explained 80% of the variability in farmers' intention. Moreover, perception of pesticide risks (P < 0.01) and employment c information sources (P < 0.05) had a positive relationship with intention for safe handling of pesticides, thus showing a predictiv link with intention. Therefore, promoting farmers' perception of pesticide risks and providing credible information sources are essential for improving intention for safe pesticide use among farmers' perception of pesticides credible information sources are essential for improving intention for safe pesticide use among farmers.

Keywords Chemical pest control · Pesticide risks · Structural equation modeling

Introduction

Pesticides are a useful tool for farmers, which help them to cope efficiently with pests and plant pathogens in crop production. However, pesticides can affect the health of living organisms and can cause serious environmental pollution (Damalas 2009; Damalas and Eleftherohorinos 2011). Farmers directly involved in spraying are at high risk of exposure to pesticides through unsafe handling and disposal practices, along with pesticide residues on treated crops (Damalas et al. 2006; Damalas

Responsible Editor: Baojing Gu

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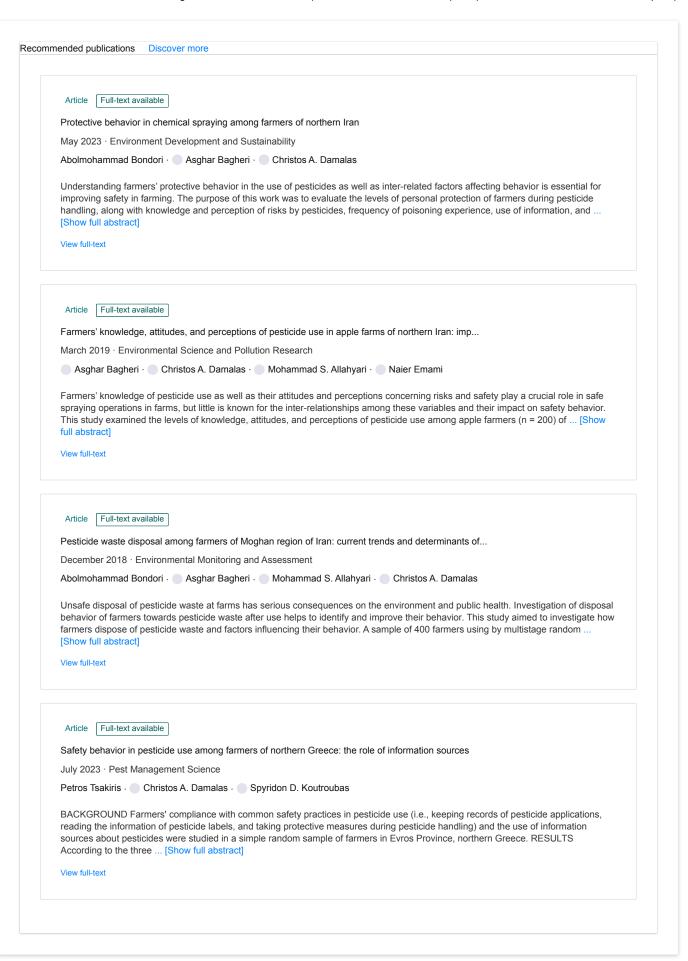
and Koutroubas 2016; Manyilizu et al. 2017). Moreover, som of these agricultural chemicals leave behind residues on foo (Mutengwe et al. 2016; Lapierre et al. 2019) and thereby car produce ill effects to consumers when concentrations excee safe tolerance levels. Occupational expo sure to agrochemical is a serious hazard for farmers and farm laborers, particularly i the developing world, because thes e groups have higher cumu lative exposures than do individuals in the general environmer (Ghasemi and Karami 2009; Hashemi et al. 2012). Due to lacl of training in the majority of farmers (Omari 2014; Sankoh et al 2016), malpractice in agrochemicals use is commonly observed.

Understanding the extent of pesticide overuse and factor driving farmers to overuse pesticides in agricultural produc tion is imperative to protect public health and promote agri cultural sustainable development. To this end, studying per ception of pesticide dangers and beliefs pertaining to the us of pesticides can be a first act for interventions to reduc pesticide use and associated risks in the rural communit (Yuantari et al. 2015; Shams et al. 2015). Previous research in Iran showed that greenhouse holders viewed pesticides a

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are dea pre	In many developing countries, including Uganda, agro-input dealers (hereafter referred to simply as agro-dealers ‡) the primary conduit of pesticides and a key source of plant health information to farmers. [7] [8] [9][10] Thus, agro- lers can play an important role in mitigating the risks of pesticides to humans and the environment. While a few vious studies have investigated agro-dealers' role in pesticide risk reduction, they focussed mostly on pesticide wledge and practices of agro-dealers and the advice they give to farmers
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61 Sim	oyment of information sources was positively related with farmers' intention to handle pesticides safely in Iran. ilarly, information sources were among the main factors underpinning pictogram understanding on pesticide n Iran. 33 The main source of information for farmers of the study regarding pesticides was the pesticide s
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	knowledge, risk perception, and use of information were positively correlated with experience in spraying. y, farming experience was significantly correlated with farmers' safe use of pesticides (Bondori et al., 2021).
	ncing risk in the face of natural hazard plays a major role in safety behavior because it makes people aware of nerabilities, thus increasing their perception of risk (Terpstra et al. 2011;Bronfman et al., 2020)
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