Sigma Theta Tau International
28th International Nursing Research Congress
2017

Title: Effects of Insecticide Exposure Prevention Program on Exposure and Blood Cholinesterase Levels in Thai Farmers

Presenters: Sukanda Worapitpong, MSN, RN and Noppawan Piaseu

Purpose: The present study aimed at investigating the effects of an insecticide exposure prevention program on exposure and blood cholinesterase levels of farmers.

Specific research objectives were:

1) to compare insecticide exposure levels between the experimental and the control groups after the program

2) to compare blood cholinesterase levels in the experimental group before and after the program

3) to compare blood cholinesterase levels in the experimental and the control groups after the program.

Methods: This Quasi-experimental research aimed at investigating the effects of insecticide exposure prevention program on exposure and blood cholinesterase levels of farmers. The conceptual framework was guided by Donabedian and the RAMA Model including four components: Raising Awareness at the individual, family and community levels, Aiming at target outcome, Mobilizing change and innovation, and Assuring synergy for home visits and assessments by health teams. Through convenience sampling with inclusion criteria, the sample included 49 radish farmers exposed to Organophosphate consisting of experimental group (n=25) and a control group (n=24). The experimental group participated in a 12-week insecticide exposure prevention program. The Raising Awareness included group process at the individual and family levels, and focus group with community leaders, stakeholders, supporters, and healthcare team. Aiming at target outcome included community participation aimed to determine problem and set a mutual goal to protect insecticide exposure in community. Mobilizing change and innovation consisted of group activity aimed to promote a use of protective equipments, demonstrate role model, encourage a positive reinforcement and exchange of experiences to prevent insecticide exposure. The innovation emerged in this study was the insecticide exposure prevention strategies and environmental safety regulation in the community. Assuring synergy involved home visits by health team, prevention of insecticide exposure toward the community rules, and management of the problem. Unexpectedly, during the data collection process, the experimental group experienced the insect outbreak, therefore, they used insecticide more frequently. The control group received a guide book for farmers and routine nursing care. Data were collected from April to July, 2016. Data were then analyzed using descriptive statistics and inferential statistics including Chi-square test, Paired t-test, Independent t-test, Mann Whitney U test.

Results: Results revealed that mean age of the experimental group was 37.04 years (SD = 6.74) and that of the control group was 37.71 years (SD = 9.90). There were more male farmers in the experimental (72%) and the control (70.8%) groups. The insecticides used by the farmers were organophosphate, avermectin, pyrazole, phenylpyrazole, and chloroacetamide. Most of the samples had been using these insecticides for 6-10 years, 3-4 times a week. The subjects' characteristics were not statistical different between the experimental and control groups.

Since the mean scores of insecticide exposure between of the experimental (38.52) and the control (40.83) groups were significantly different before the program ($t = -2.135$, $p = .038$), mean differences between the experimental and the control groups were compared using Independent t-test revealing that mean difference of insecticide exposure was higher in the experimental (9.72) group than the control (2.63) group ($t = 6.612$, $p < .001$). The experimental group had insecticide exposure levels at 38.52 before and 28.80 after the program. The Paired t-test showed that after the program, the experimental group had less insecticide exposure level when compared to that before the program ($t = 10.924$, $p < .001$).

The experimental group had blood cholinesterase levels at 7.01 before and 6.59 after the program. The Paired t-test showed that after the program, blood cholinesterase levels of the experimental group were not significantly different when compared to that before the program ($t = 1.315$, $p = .201$). Blood cholinesterase levels between of experimental (6.59) and the control (7.46) groups. The Independent t-test showed that after the program, blood cholinesterase level in the experimental group was not significantly different from the control group ($t = 1.343$, $p = .186$).

Conclusion: The results suggest that community nurse practitioners apply the principle of Raising awareness, Aiming at target outcome, Mobilizing change and innovation as approaches for insecticide exposure prevention program in the "farmers' health clinical", along with outcome monitoring for sustainability.

References:

American Association for Clinical Chemistry. (2016). Cholinesterase Test. [Online]. Retrieved from http://labtestsonline.org/understanding/analytes/cholinesterase/tab/test/

Ministry of Public Health, Department of Disease Control, Bureau of Epidemiology. (2013). The Occupational health manages guide book for public health team: farmers health clinic. Bangkok: Agricultural cooperative printing of Thai Ltd.

Raksanam, B., Taneepanichskul, S., Robson, M. G. & Siriwong, W. (2014). Health risk behaviors associated with agrochemical exposure among rice farmers in a rural community, Thailand: a Community-based ethnography. Asia-Pacific Journal of Public Health, 26(6), 588-595.

Siriphanich, S. (2013). Situation and Health Effects Related to Pesticides, 2013. Weekly Epidemiological Surveillance Report, 44(44), 689-692.

Thepphukhieo, S. & Daenseekaew, S. (2013). Community participation in chemical pesticides prevention for flowers planting and garland making. Journal of Nurses' Association of Thailand, North-Eastern division, 31(1). 80-89.

Tritipsombut, J., Gabklang, P., Boonkerd, S. & Oapsuwan, A. (2014). The study of knowledge attitudes and pesticide usage behaviors among the agricultural workers at Huay sam kha village, Tub ruang sub-district, Phra thong kum district, Nakhon Ratchasima province. Srinagarind Medical Journal, 29(5), 429-434.

World Health Organization. (2004). Guidelines on the prevention of toxic exposure. N.P.: World Health Organization in collaboration with the United Nations Environment Programme and the International Labour Organization.