

Development of a Community Coaching Program on Safe Handling of Agricultural Pesticides among Users

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Abstract: One of the major problems seeking change now more than ever within the community is unsafe handling of agricultural pesticides. People use pesticides in agricultural production to prevent or control pests, diseases, weeds and other plant pathogens in an effort to reduce or eliminate yield losses and maintain high product quality. This study aimed to develop a community coaching program on safe handling of agricultural pesticides among users. Pre - Experimental Research Design. The study was conducted at Bani Salama Village at Wady El Natron City El Beheira Governorate. Thirty agricultural pesticide users were conveniently selected and included into the study. Five tools were used to collect data included personal coaching skills self-assessment checklist, socio-demographic characteristics and health issues related to pesticides structured questionnaire, knowledge about safe handling of agricultural pesticide structured questionnaire, practices of safe handling of agricultural pesticide structured observational checklist and five steps of successful coaching skills structured observational checklist. Nearly one fifth of the potential coaches had satisfactory coaching skills scores. A significant improvement in the coaches' total mean knowledge scores of safe handling of agricultural pesticide where the mean % score was 26.04 ± 2.98 pre-coaching and improved to 72.58 ± 5.27 at immediate post-coaching. Moreover, significant improvement in their total mean practices scores where the mean % score was 10.98 ± 3.20 pre-coaching and improved to 19.76 ± 7.12 at 3 months post-coaching. Conclusion: the majority of coaches had a significant improvement in their total mean scores of coaching skills, knowledge and practices of safe handling of agriculture pesticides after program than before. Recommendations: introduce specific educational programs for all farm workers prior to engage them for pesticide application.

Key words: Agricultural Pesticides • Community • Coaching • Program • Safe Handling

INTRODUCTION

Growing concern about environmental protection, human health and food safety has brought renewed interest in pesticide use in agriculture. The world's population is expected to grow to almost 10 billion by 2050, boosting agricultural demand. This population growth, combined with the diet demands of a wealthier populace, is expected to double world food demand by 2050. Global pesticide production will be 2.7 times higher in 2050 than in 2000, exposing humans and the environment to considerably higher levels of pesticides [1, 2].

All over the world, the use of pesticides is considered the most attractive method of controlling pests. Recent researches has shown that pesticides may also have

negative impacts on public health [3]. Ideally a pesticide must be lethal to the targeted pests, but not to non-target species, including man. Disappointingly, this is not the case, so the controversy of use and abuse of pesticides has appeared. The extensive use of these chemicals, has performed disaster with human and other life forms. Pesticides can remain in the environment for many years and may be transported over a long distance and the excessive application of these compounds over the past half-century has posed serious risks to human health [4].

The key to reduce health hazards while using pesticides is to always limit one's exposure by wearing PPE and use a low-toxicity pesticide when available. Reading the label and practicing safe work habits will minimize hazards from the use of pesticides. It would also

be useful to minimize the use of pesticides and encourage alternative measures [5-7].

Prevention and intervention programs regarding the use of protective measures and monitoring the health status of farmers should be implemented [7].

Communities are currently seeking change more than ever and many are finding coaching to be an effective strategy to aid them in their efforts. Community coaching is defined as, “an adaptive process tailored to unique community contexts to guide systemic change via participant empowerment.” A popular definition is “a community coach is a guide who supports communities and organizations in identifying and achieving their goals” [8].

Community coaching differs in several ways from many other types of coaching. It helps to make the link between facts, analysis, opinions and judgment explicit. The following points have been important to community coaches in their coaching work [8]. Initially, community coaching requires a degree of detachment, catalytic and a reflective activity. It is an extremely efficient tool to help groups reframe their operating systems, develop new ideas, move to new leadership and negotiate partnerships, critical skills for successful community building efforts [9].

Furthermore, community coaching is not formulaic: successful coaches understand, intuitively and concretely, that there is no one size for everyone, that each community is unique and that each community must discover and nurture this uniqueness by building capacity and doing things [8].

In conclusion, coaching is becoming increasingly popular due to promising results. Although coaching initiatives are relatively young, many people believe that this process as life changing that it takes time and effort to make a lasting change. Effective community coaching recognizes that every individual has something to contribute, but people often need a catalyst to bring into a group innate wisdom. Coaching can open the door to a process of transformation that unlocks wisdom, intuition and group insight [8, 10].

One of the major problems is seeking change “now more than ever” within the community is unsafe handling of agricultural pesticides. People who use pesticides in agricultural production to prevent or control pests, diseases, weeds and other plant pathogens in an effort to reduce or eliminate yield losses and maintain high product quality [11]. These pesticide substances have both direct and indirect negative health effects on farmers or users and consequently their families [12].

Unfortunately, pesticides are stored in easily accessible home areas to family members especially

children. Often agricultural pesticide users cannot read labels and do not follow instructions. Most users do not use personal protective equipment because it is unsuitable for the climate, unavailable, too expensive or unaware of the necessity for using such equipment. Moreover, no washing facilities in the field where users spray pesticides and they seldom wash even when pesticides spill on their skin. Dramatically, users often reuse pesticide containers for storing or transporting their crops or for washing their utensils [13].

Solutions-focused coaching (OSKAR coaching model) is a very powerful approach to coaching. Its core is to help the coachee find solutions instead of problems, build on strengths instead of weaknesses and find positive ways forward instead of examining barriers. By directing energy positively to strengths and working towards a solution, a coachee feels motivated and energized instead of de-motivated and demoralized, a feeling you probably experienced when problems and difficulties are discussed and analyzed. Use an OSKAR coaching approach to provide a framework for navigating a route through coaching sessions and provide a way to get the session back on track if necessary. The five stages of OSKAR are: Outcome, Scaling, Know-How, Affirm & Action and Review [14, 15].

O-Outcome: Is the difference that the coachee wants to see as results of the coaching.

S- Scaling: Determines to what extent the coachee believes the current situation is working

K-Know-how & Resources: Enables the coachee to establish what factors are already contributing towards moving the situation closer to the desired out-come.

A-Affirm & Action: Helps to build the coachee’s self-belief, as well as enhancing their relationship with their coach.

R-Review: the review stage involves reviewing progress and takes place at the beginning of the next coaching session [15].

Communities often look to their primary care providers as important sources of information and guidance on suspected pesticide-related health conditions [16]. Nurse as primary care providers can play a key role in identifying and decreasing potential pesticide poisonings and exposure if they are prepared for this role. Providers must be able to problem solve with patients who think an exposure has occurred. With the potential

effects of pesticide exposure on health so widespread and consequential, an understanding of the pathophysiology and management of pesticide exposure and toxicity is important in all areas of health care practice, including assessment, diagnosis, planning, intervention and evaluation [16, 17].

Significance of the Study: Literature review showed that most researches focus on coaching of individuals or groups such as health coach. Community coaching is an uncommon approach in nursing science dealing with people in the community, enables their learning and development to occur and thus performance to improve.

Unsafe handling of agricultural pesticides due to direct or indirect exposure lead to huge side effects either acute or chronic and affect pesticide users and their family. Surprisingly, most research focused on individuals with direct exposure to pesticides and those indirect exposure was neglected because its' harder to find.

Based on "Egyptian vision 2030 of Health Pillar is all Egyptians enjoy a healthy, safe and secure life through an integrated, accessible, high quality and universal healthcare system capable of improving health conditions through early intervention and preventive coverage". There is crucial needs to empower the community to examine their needs for safe handling of pesticides and tailor the solution based on their resources.

Aim of the Study: The study aimed to develop a community coaching program on safe handling of agricultural pesticides among users.

Research Hypothesis: The coachees who receive community coaching program exhibit higher scores of coaching skills, knowledge and practice about safe handling of agricultural pesticides after the program than before it.

Operational Definition:

- Agricultural workers: is defined as any person who performs tasks related to growing and harvesting plants on farms or in greenhouses, nurseries, or forests
- Pesticide handling: is defined as process of mix, load, or apply agricultural pesticides; clean or repair pesticide application equipment; or assist with the application of pesticides.
- Crop Advisors: is defined as any person who is assessing pest numbers, damage, pesticide distribution, or the status or requirements of agricultural plants.

- Pesticide Dealer: stores bulk fertilizer or a restricted use pesticide for redistribution or direct resale, OR is in the business of applying any pesticide to the lands of another.

MATERIALS AND METHODS

Materials

Design: Pre- Experimental Research Design (One group pretest and posttest).

Setting: The study was conducted at Bani Salama Village which has the largest population number at Wady El Natron City- El Beheira Governorate. This city is the major agricultural land in El Beheira Governorate, Egypt.

Subjects: Agricultural pesticide users "community coachee" were conveniently selected based on the following inclusion criteria:

- Age 18-40 years
- Residence in the above mentioned village
- Read and write
- Expose directly or indirectly to agricultural pesticide during mixing or spraying
- No history of chronic diseases
- Have android mobile (personal or shared with family member)
- Pass in Tool (I) "Coaching Skills Self-assessment Structured Checklist" with 75% or more
- Agree and available to participate in the study "Community Coaching program" for a period of (8 months plus two weeks) and provide written consent.

Sample Size: The Agricultural pesticide users "community coachees" who accepted to enroll into the study were 185. Thirty community coachees were included into the study according to the previously mentioned inclusion criteria.

Tools of Data Collection: Five tools were used to collect the necessary data for the study:

Tool I: Coaching Skills Self-assessment Checklist[18]: It includes 33 Subtotal Self-assessment items of Coaching Skills representing 8 sections.

Scoring System: Coaching Skills question was scored as I do this very poor (0), I do this to some extent poor (1), I do this neutral (2), I do this well (3), I do this very well (4). This part was assessed on 5 frequency rating

questions ranged from 0 to 4. A total score for Coaching Skills was obtained by summing the scores of these 8 sections which ranged from 0-132 and was then levelled as follows:

- Unsatisfactory coaching skills: Score % <75%
- Satisfactory coaching skills: Score % =75%

Tool II: Socio-Demographic Characteristics and Health Issues Related to Pesticides Structured Questionnaire Sheet: It includes three parts of 14 items as follows:

Part (1): Socio-Demographic characteristics, include name, address, telephone number, age (year), educational level, marital status, occupation, family income.

Part (2): Health Issues Related to Pesticides, include age of family members at risk of exposure, ways of pesticide exposure, duration of exposure (year), current pregnancy, number of abortion

Part (3): Acute pesticide side effects as vomiting, nausea, headache.

Tool III: Knowledge about Safe Handling of Agricultural Pesticides Structured Questionnaire Sheet: It includes 97 items representing eight sections.

These sections are I) Pesticide label instructions (12 items such as what "danger, warning and caution" words means for human health in pesticide label), II) Protective Clothing (7 items such as what are the personal protective equipment used to work safely with pesticides), III) Storing of pesticides (11 items such as what are containers used for pesticide storing, characteristics of storage area to ensure human and pet safety), IV) Transporting pesticides (4 items such as bag pesticides separately from grocers, secure pesticide containers in an upright position to prevent accidents), V) Apply pesticides safely (30 items such as methods of mixing the pesticides, place of mix, children and pets out of the area and environmental condition permit pesticide mixing), VI) Safe disposal of pesticides and pesticide containers (14 items such as how to dispose unused pesticides and used containers and how to reuse empty containers), VII) Pesticide spills (10 items such as how to clean spill up promptly and equipment used) and VIII) First Aid (9 items such as measures used in case of emergency).

Scoring system: Each respondent was asked about the eight sections of pesticide knowledge. Each item was scored as 'yes' or 'no'. One mark was given to 'correct' answer and zero was given to 'incorrect' and "don't

know" answer. The total knowledge scores extended from 0 to 97 point and transformed into score % as follows:

- Poor knowledge: Score % < 60%
- Satisfactory knowledge: Score % 60 %-< 75%
- Good knowledge: Score % =75%

Tool IV: Practices of Safe Handling of Agricultural Pesticide Structured Observational Checklist: It includes 29 items representing three sections of pesticide handling. These sections are I) Practices performed before using pesticides (3 items such check the pesticide label, check right kind of personal protective equipment, remove food, dishes, pots and pans from the room before application of pesticide), II) Practices performed during application of pesticides (11 items such wash her hands with soap and water, open the windows, keep children and pets out of the application area), III) Practices performed after using a pesticides (15 items such wash her hands with soap and water immediately after applying a pesticide, wash all clothing worn during mixing and application separately from household laundry, use a heavy duty detergent and hot water, dry the clothes in a hot dryer or outside in the sun).

Scoring System: Each respondent was given scores according to their risk factor status onsite (home/farm) during handling of agricultural pesticides. Each item was scored done or not done. A score of 1 was given to "safely handling" and score 0 for "unsafely handling". The scores of total practice ranged from 0 to 29 point and were transformed into score % as follows:

- Unsafely handling of pesticides: Score % <75%
- Safely handling of pesticides: Score % ≥ 75%

Tool V: Five Steps of Coaching Process Structured Observational Checklist [19]:

The purpose of this checklist is to assess the coachees' strengths and weaknesses points during community coaching. It includes 19 items representing 5 steps of Successful Coaching process. These steps are started with I) Focus (5 items such Greet trainee, Determine what trainee knows, Encourage questions, Share an overview of the community to be taught, Discuss training safety consideration), then II) Explain and demonstrate (4 items such Explain the step (s), explain why, when and how, demonstrate how, encourage questions) and III) Observe (4 items such have coachee verbally walk through step, select a safe observation location, have coachee explain each step and then

demonstrate it, observe coachee demonstrating work), IV) Feedback (3 items such as trainee to do a self-assessment, give feedback on performance, assess your coaching progress), where coach and coachee discuss the performance in step 3. cycle through steps 2, 3 and 4 to- develop the expected performance and ensure understanding and move on. The last step is V) Higher level of management (3 items such establish coachee's readiness for evaluation, make arrangements for evaluation, based on outcome of evaluation and consider the next step).

Scoring System: Each participant was given a scores according to five steps of successful coaching skills process. The items discrete scores for coaching process scale were " correctly done" had score 2, "incomplete done" had score 1, "not done" had score 0", then the total items summed together, the sum of scores for each step and total score was calculated by summing the scores given for its responses. Ranged from 0- 38. All scores were transformed into score % as follows:

- Unsatisfactory coaching skills: Score % <75%
- Satisfactory coaching skills: Score % ≥ 75%

Methods:

- An official letter was directed from the faculty of Nursing- Damanhour University to undersecretary of Ministry of Health to obtain his approval about providing the maternal and child health center in the Bani Salama village as a popular place for implementation of the activities of the community coaching program activities (selection, planning, implementation and evaluation phases).
- The Tool I and Tool V were revised for content validity by 3 experts in the field of Community Health Nursing and tested for reliability using Cronbach's coefficient alpha, with reliability of 0.91 % and 0.89 %, respectively.
- Tools II, III and IV were developed and translated into Arabic language by the researchers after a review of the related literature.
- A jury composed of 5 experts in the related fields as Community Health Nursing and Agricultural Extension and Rural Society Departments were consulted to examine the content validity of the study tools and all tools verified to be valid.
- Reliability of tool III and IV were tested by using Cronbach's alpha test on 5 coachees. It showed

acceptable level of reliability 87% and 92%, respectively.

- A pilot study was done for (Tool I, II, III, IV and V) on 5 coachees that were not involved in the study subjects to test feasibility, clarity and applicability of the tools. Necessary amendments were done accordingly.

Community Coaching Program (Fig. 1): The community coaching program was divided into four phases: selection (once/week), planning (once/week), implementation (5 months) and evaluation phase (3 months). Implementation phase consisted 8 sessions (one discovery session, two workshop sessions for theoretical part, four onsite observational coaching sessions for practical part and finally one closing session).

One session per week for all sessions for 6 weeks except onsite coaching session was one session per month for 4 months. The sessions were conducted on Saturday of each week. Each session started at 9 AM to 12 MD. The researchers allow the participants to take break for half an hour at 10:30 then continue the session activities.

Selection Phase Activities:

- Selection of potential community coachee (once/week): The researchers conduct one day medical convey and screening for diabetes and hypertension in Bani Salama village to permit availability of large number of village's population. During this medical event, the researchers clarify characteristics of good coach, the importance of coaching for community change.
- After acceptance of potential coachee to participate in the study as a coachee, they were given Tool I and be selected in the study based on inclusion criteria.
- The incentives for coachee are in forms of a) financial incentives every month from researchers; b) psychological counseling for them and their family members in the psychological consultation center - Faculty of Nursing - Damanhour University; c) regular monitoring of Random Blood Sugar and Hypertension during the study period.
- Community coaches team finally were 30 coachee out of 185 as: 8 for Housewife (handling of pesticides at home), 10 for Farmer, 5 for Pesticides dealer/Local suppliers and 7 for Crop advisor/Agricultural extension agent. This team were invited to start the program next week in planning phase.

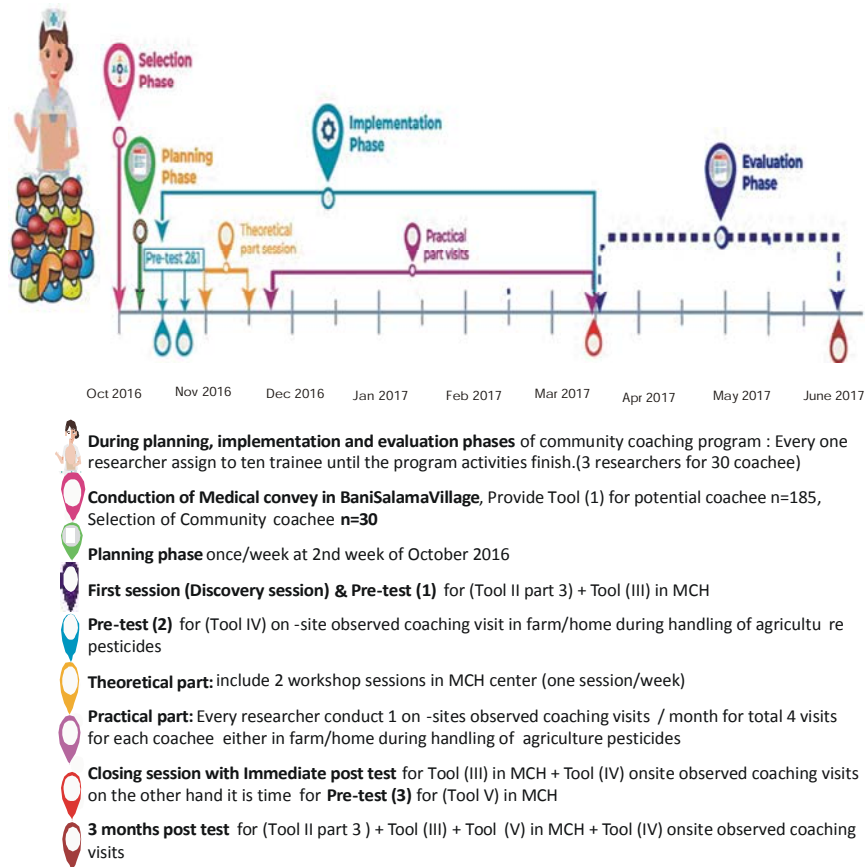


Fig. 1: Community Coaching Program and Data Collection Points

Planning Phase Activities: Planning phase of community coaching program in MCH between coach and their coachee, over 1 week (once /week) in the 2nd week that cover the following activities:

- Define goal of a Community Coaching Program regarding safe handling of agricultural pesticide
- Develop objectives.
- Develop activities to meet those objectives (activity list).
- Prepare community coaching scenarios.
- Determine resources needed to meet those objectives
- Prepare place of program and educational materials (brochure)
- Finalize plan.
- Determine tracking and assessment method.
- Identify responsibilities of coach and coachee during the study.
- Develop timeline session schedule

Implementation Phase Activities (Table 1): Implementation phase of Community Coaching

Program of 8 sessions based on solution-focused coaching approach (OSKAR coaching model) during session activities, over 5 months and divided into two parts:

Indoor workshop sessions in MCH to assess the following topic:

- Conduct intake/discovery session (1st session)
- Pretest for (Tool II part 3) and (Tool III) in MCH center
- Pretest for (Tool IV) (onsite observed visits during handling of agricultural pesticide) in farm/home
- Knowledge about safe handling of agricultural pesticide
- Five steps of Successful Coaching process

On-site observed coaching visits to assess practice of safe handling of agricultural pesticide.

Table 1: Timeline schedule of Community Coaching Program sessions [18, 20-22]

Session (1): First session/Intake session/ Discovery session (once/week in MCH center)

The most important aspect of the discovery session is to create relationship between coach and their coachee.

Learning objectives: Upon completion of this session, the coachee will be able to:

- Identify purpose of the study
 - Written agreement to participate in the study.
-

Content:

- Welcome and Introductions
 - The Coach/Coachee Relationship [Establishing a Relationship through Effective Communication includes Listening Skills, Asking Good Questions, Giving Feedback and Communication Skills Summary]
 - Purpose of the study
-

Activities:

- Start coachee introduce him/herself such as name, address, family members, occupation, values clarification, life purpose, passions, etc.
 - The coachee discuss what his/her expectations from community coaching program such as goals, objectives, or personal development areas
 - The researchers clarify the learning objectives of the program and the opportunity for each coachee to write down their learning needs and what they expect to achieve through the program.
 - The telephone numbers were obtained from the participants by the researchers in the first session to develop ways of distant contact and communication.
 - The researchers created Facebook and WhatsApp groups for continuing education, discussion, problem solving and appointment confirmation.
-

Materials: Flipchart paper, easel and markers.

Break: 30 minutes.

Pretest:

- Tool (II part 3) and Tool (III) 45 minutes -1 hour in MCH center
 - Tool (IV) (every 10 coachees assigned to 1 coach (researcher) to perform pretest through on-site observed coaching visit within 30 minutes at preset date during this week)
-

Theoretical Part (include 2 workshop sessions)

Session (2): Community Coaching

The corn stone of this session is present information about coaching in general and community coaching in particular.

Learning objectives: Upon completion of this session, the coachee will be able to:

- Identify coaching definition, coach styles, philosophy and values and benefits.
 - Define community coaching and its' importance
-

Content:

- What is Coaching and Why Is It Important?
 - Basic coaching skills
 - Coaching competencies and practices
 - How is community coaching different from other types of coaching?
 - Reasons for community coaching
 - Principles of good community coaching practices
 - Steps of Successful Coaching process
 - Community Coaching Tips
 - Responsibility of coach/coachee in the study
-

Activities:

- Icebreaking
 - Motivation of coachee to participate in session activities;
 - During all sessions of community coaching program, the Coachees were distributed into small equal groups (ten coachee for one researcher) that facilitate the group interaction.
 - At the beginning of each session, the coach documents the answers of coachee on a flipchart for content items of each session. After that, the coach discuss each content item and compare what is discussed to what was originally brainstormed by the cochee.
 - The group can organize their thoughts on the board, or on sheets of paper, or on post-it notes throughout workshop activities.
 - Reserve a room with a large wall or workspace where the group can write down their thoughts, physically display them on the wall and organize them.
 - Community Coaching Scenarios (Identify a well-demonstrated community coaching scenario and ask if the group would demonstrate their scenario in front of the class and encourage group discussion to analysis this scenario for strengths and weakens aspects).
 - Provide feedback at the end of session
-

Materials: Flipchart paper, easel, markers and tape

Session (3): Knowledge about Safe Handling of Agricultural Pesticide

Table 1: Continued

<p>Learning objectives: Upon completion of this session, the coachee will be able to:</p> <ul style="list-style-type: none"> Acquire knowledge related to safe handling of pesticides.
<p>Content:</p> <ul style="list-style-type: none"> Pesticide label instructions Protective Clothing Storing of Pesticides Transporting Pesticides Apply Pesticides Safely Safe Disposal of Pesticides and Pesticide Containers Pesticide Spills First Aid
<p>Practical Part (include 4 onsite coaching sessions/ one coachee, one session/ month)</p>
<p>This part used to learn the coachee about Safe Handling of Agricultural Pesticide</p>
<p>Learning objectives: Upon completion of this session, the coachee will be able to:</p> <ul style="list-style-type: none"> Apply safe handling practices of pesticides.
<p>Activities:</p> <ul style="list-style-type: none"> Providing opportunities to practice and refine performance. Observing performance and providing feedback at the beginning of the on-site coaching visit, the coach observe coachees' practice of handling of agricultural pesticides. Based on OSKAR model, the coach focus on strengths of their coachee to solve unsafe practice
<p>Materials:</p> <ul style="list-style-type: none"> Practices of Safe Handling of Agricultural Pesticide Structured observational checklist (Tool III) Personal protective equipment
<p>Closing session (once/week in MCH center)</p>
<p>Learning Objectives: Upon completion of this session, the coachee will be able to:</p> <ul style="list-style-type: none"> Evaluate the effectiveness of the community coaching program in achieving its objectives Discuss coachee's expectations about community coaching program. Perform immediate posttest after finishing of the community coaching program Summary and feedback Allocate time of post-test 3 months after finishing of the community coaching program in MCH center Share closing thoughts and impressions Obtain the agreement to be a community coach and conduct the program anywhere.
<p>Activities</p> <ul style="list-style-type: none"> Posters and brochures were prepared and disseminated by the researchers and included health information about "Do" and "Don't" activities with handling of agricultural pesticides. These health education materials had specific take-home information for lay people.
<p>Materials: Flipchart paper, easel and markers.</p>

Evaluation Phase Activities:

- For evaluation of community coachee about successful coaching process steps, knowledge and practices of safe handling of agricultural pesticides and acute pesticides side effects. The comparison was done between the same community coachee at pre, immediate and post-test for using Tool III and Tool IV, while using Tool II -Part 3 for pretest and post 3 months. To determine the program's effect using Tool V for immediate post-test and 3 months later.

The data was collected started from October 2016 to the end of second week of June 2017:

- 5 months plus two weeks for selection, planning and implementation of community coaching program and
- 3 months post- program for evaluation phase.

Ethical Considerations: Written consent was obtained from each study subject included in this study after appropriate explanation of the study purpose. Study subjects' privacy and confidentiality of the collected data was maintained.

Statistical Analysis: After collecting data, responses to each questionnaire item were entered into the Statistical Package for Social Sciences (SPSS) software version 20.0. The level of significance (p-value) was set at ≤ 0.05 . The following statistical tests were used:

Descriptive Statistics: It was used for representation and tabulation of data. Continuous variables were represented as means \pm SD while categorical variables were represented as frequencies and percentages. The mean percent scores for personal coaching skills, five steps of successful coaching skills, knowledge and practices about safe handling of agricultural pesticide were calculated.

Analysis of Numeric Data: The following statistical tests were used:

- Independent sample t-test: A parametric statistical test was used to compare the mean for two independent groups.
- Chi-square: used for comparison of qualitative variables between the studied groups
- One Way ANOVA test: Parametric statistical tests were used to compare the means for quantitative data of more than two independent groups and detect significant differences.

RESULTS

Table (2) presents that nearly half (46.5 & 41.6%) of the potential coachee have listened actively and were able for clarifying exact words and what others have said. While nearly one third (29.7%) of them perceived themselves as having the coaching skills of developing trust and and able for asking the best questions. The same table reveals that nearly one fifth (16.2%) of them had satisfactory coaching skills scores and this let them to be join into the study compared to 83.8% had unsatisfactory coaching skills scores, where the total self-assessment mean scores were 38.1 ± 26.1 .

Table (3) portrays that the majority (76.7%) of the community coaches were in the age group 18-<34 years, less than one fourth (23.3%) were in the age group of 34 to 40 years and 66.7% of them were male. In addition, one fifth (20.0%) of them had basic education and 23.3% had preparatory school education. While, less than half (40.0%) and 16.7% of coachee had secondary school and university education respectively. More than three quarters of them were single as well as more than one fourth of them (26.7%) were housewife who handling of pesticides at their homes. Exactly one third of coachee were (33.3%) farmer, (23.3%) crop advisor and (16.7%) pesticides dealer. A high proportion of the sample (63.3%) had enough family income, while 10.0% stated that their income not enough.

Concerning health issues related to pesticides, 23.3 and 26.7% of coachees reported that those less than 5 years and those above 60 years were the highest age at risk of exposure to pesticides respectively, where 60.0% of them had direct contact with pesticides for less than 2 years. Also, it was revealed that the majority of coachee were not currently pregnant and 50.0% of them hadn't previous history for abortion.

Table (4) represents that the majority (76.7%) of the community coachee had not any pesticides training before. Of those who previously attending pesticides training less than one fourth (23.3%) had attend training once or twice and more than half of them reported as training executed by agriculture cooperative society.

Table (5) shows that the community coachee had reported acute pesticides' side effect. The highest percentages of reported acute pesticides' side effect at pre-coaching were shortness of breath (56.7%), followed by itchy eyes (50.0%) and skin irritation (46.7%) versus to 16.7%, 26.7% and 16.7% at 3 months post-coaching respectively. However, at pre-coaching poor vision and dizziness were the lowest percentages reported acute pesticides' side effect by coachees were 6.7% and 10.0% respectively compared to the same percentages (3.3%) at 3 months post-coaching. In addition, stomach ache was reported by 26.7% compared to same percentages (23.3%) for nausea and coughing respectively. While these percentages were decreased after 3 months post-coaching to be 20.0%, 6.7%, 13.3% for stomach ache, nausea, coughing respectively.

Table (6) shows the coachees' knowledge about that "identify the importance of reading pesticide label instructions" was 2.65 ± 2.15 pre-coaching which improved to 8.95 ± 2.66 at immediate post-coaching and 5.95 ± 0.56 at 3 months post-coaching. Furthermore, their knowledge about importance of using protective clothes was 0.85 ± 1.03 pre-coaching and improved to 5.6 ± 1.22 at immediate post-coaching and became 3.6 ± 1.01 at 3 months post-coaching. Additionally, the coachees' knowledge regarding storing of pesticides (Ensure Human and Pet Safety) was 2.15 ± 2.06 pre-coaching, then improved to 8.99 ± 4.01 at immediate post-coaching and 7.95 ± 2.15 at 3 months post-coaching. Moreover, the coachees' knowledge regarding ways of safe transporting pesticides (Prevent Accidents) was 0.31 ± 0.41 pre-coaching and improved to 3.01 ± 1.33 at immediate post-coaching and reached 3.00 ± 0.21 at 3 months post-coaching. Regarding apply pesticides safely (Follow the Label and Use Precautions) was 9.86 ± 5.82 pre-coaching and improved to 20.6 ± 7.22 at immediate post-coaching and be came at 17.2 ± 5.03 at 3 months post-coaching.

Table 2: Distribution of potential coachee (selection phase) according to their coaching skills self-assessment (n= 185)

Items	Potential coachee (selection phase) (n= 185)	
	No.	%
Subtotal coaching skills self-assessment		
1. Developing trust	58	31.4
2. Being present	50	27.0
3. Listen actively	86	46.5
4. Clarifying	77	41.6
5. Empathizing	53	28.6
6. Being succinct	28	15.1
7. Asking the best questions	55	29.7
8. Giving feedback	44	23.8
Total scores of coaching skills:		
• Unsatisfactory personal coaching skills score % <75%	155	83.8
• Satisfactory personal coaching skills score % ≥75%	30	16.2
Mean±SD	38. 1±26. 1	

Table 3: Distribution of community coachees according to their socio-demographic characteristics and health issues related to pesticides (n= 30)

Items	Community Coachee (n= 30)	
	No.	%
Socio-demographic characteristics		
Age (year):		
•18 -	13	43.4
•26 -	10	33.3
•34 - 40	7	23.3
Mean ± S.D.	22.3±10.89	
Gender		
•Male	20	66.7
•Female	10	33.3
Educational level:		
•Read & write	0	0.0
•Basic education	6	20.0
•Preparatory	7	23.3
•Secondary	10	40.0
•University or higher	7	16.7
Marital status:		
•Single	23	76.7
•Married	4	13.3
•Divorced	2	6.7
•Widow	1	3.3
Occupation:		
•Housewife (handling of pesticides at home)	8	26.7
•Farmer	10	33.3
•Pesticides dealer/Local suppliers	5	16.7
•Crop advisor/Agricultural extension agent	7	23.3
Family income:		
•Enough	19	63.3
•Not enough	3	10.0
•Enough and saved	8	26.7
Health Issues Related to Pesticides		
Age of family members at risk of exposure		
•< 5 years	7	23.3
•5 -	4	13.3
•12 -	6	20.0
•18 -	5	16.7
•≥ 60 years	8	26.7
Mean ± S.D.	6.22±4.12	

Table 3: Continued

Items	Community Coachee (n= 30)	
	No.	%
Ways of pesticide exposure:		
•Direct	18	60.0
•Indirect	12	40.0
Duration of exposure (year):		
•< 2 years	18	60.0
•2 -	9	30.0
•5 - 10 years	3	10.0
Mean ± S.D.	1.66±2.41	
Reproductive health status: (no.6)		
Current pregnancy:		
•Pregnant	2	33.3
•Not pregnant	4	66.7
Number of abortion		
•No	3	50.0
•1	2	33.3
•2	1	16.7
Mean ± S.D.	1.01±0.21	

Table 4: Distribution of community coachee according to their previous pesticide training (n= 30)

Items	Community coachee (n= 30)	
	No.	%
Previous Pesticide Training:		
Have any pesticides training before		
•Yes	7	23.3
•No	23	76.7
How many times		
•N/A	23	76.7
•1	6	20.0
•2	1	3.3
•3 or more	0	0.0
Who introduce pesticides training		
•Agriculture cooperative society	4	51.1
•Agriculture directorate	3	42.9
•Crop advisor	1	14.3

Table 5: Distribution of community coachee regarding to their reported acute pesticides' side effect pre, immediate and 3 months post-coaching (n= 30)

Acute pesticides' side effect	Community Coachee (n= 30)					
	Pre-coaching		Immediatepost-coaching		3 months post-coaching	
	No.	%	No.	%	No.	%
Reported problems within the last year, experienced immediately after mixing or spraying pesticides: #						
•Headache	5	16.7	3	10.0	3	10.0
•Dizziness	3	10.0	2	6.7	1	3.3
•Skin irritation	14	46.7	7	23.3	5	16.7
•Nausea	7	23.3	2	6.7	2	6.7
•Itchy eyes	15	50.0	9	30.0	8	26.7
•Vomiting	6	20.0	2	6.7	4	13.3
•Coughing	7	23.3	3	10.0	4	13.3
•Shortness of breath	17	56.7	6	20.0	5	16.7
•Fatigue	6	20.0	2	6.7	3	10.0
•Stomach ache	8	26.7	1	3.3	6	20.0
•Excessive sweating	6	20.0	6	20.0	5	16.7
•Poor vision	2	6.7	2	6.7	1	3.3
•No health problem occurs	9	30.0	20	66.7	16	53.3
#More than one answer						

Table 6: Comparison between pre, immediate and 3 months post-coaching evaluation for community coachee regarding to their subtotal and total scores of knowledge and practices of safe handling agricultural pesticide (n= 30)

Items	Community coachee (n= 30)						t-Test	p-value
	Pre-coaching		Immediate post-coaching		3 months post-coaching			
	Mean±SD	Mean±SD	Mean±SD	Mean±SD	Mean±SD	Mean±SD		
Knowledge of Safe Handling of Agricultural Pesticide								
•Subtotal knowledge scores:								
Pesticide label instructions	2.65±2.15	8.95±2.66	5.95±0.56				12.65	0.001*
Protective Clothes	0.85±1.03	5.6±1.22	3.6±1.01				8.65	0.003*
Storing of Pesticides (Ensure Human and Pet Safety)	2.15±2.06	8.99±4.01	7.95±2.15				7.98	0.002*
Transporting Pesticides (Prevent Accidents)	0.31±0.41	3.01±1.33	3.00±0.21				6.88	0.004*
Apply Pesticides Safely (Follow the Label and Use Precautions)	9.86±5.82	20.6±7.22	17.2±5.03				10.6	0.001*
Safe Disposal of Pesticides and Pesticide Containers	4.65±3.25	11.3±2.62	8.23±0.22				9.05	0.001*
Pesticide Spills (Personal Safety First)	2.96±2.11	7.02±2.06	6.3±1.33				6.98	0.004*
First Aid	2.61±2.08	7.11±2.81	6.2±1.41				5.98	0.007*
Total knowledge scores:	No.	%	No.	%	No.	%	X ² 42.98	0.0001*
Poor knowledge (< 60%)	26	86.7	0	0.0	5	16.7		
Fair (60 < 75%)	4	13.3	9	30.0	13	43.3		
Good (= 75%)	0	0.0	21	70.0	12	40.0		
Mean ±SD	26.04±2.98	72.58±5.27	46.36±3.18				t=12.0	0.001*
Practice of Safe Handling of Agricultural Pesticide								
•Subtotal practice scores:								
Before handling pesticide	0.21±0.19	1.96±1.1	1.02±0.1	3.01	0.011*			
During handling pesticide	4.25±3.02	9.52±3.2	5.32±1.07		5.26	0.006*		
After handling pesticide	6.52±3.01	13.2±2.11	10.0±1.22		6.21	0.007*		
Total practice scores:	No.	%	No.	%	No.	%	X ² 68.2	0.0001*
Unsafe handling of pesticides (< 75%)	26	86.7	0	0.0	9	30.0		
Safe handling (=75%)	4	13.3	30	100.0	21	70.0		
Mean ±SD	10.98±3.20	24.68±5.73	19.76±7.12				t=6.71	0.001*

t: Independent sample t-test X²: Chi-Square test *Significant at P ≤ 0.05

A significant improvement is observed in the coachees' total mean knowledge scores of safe handling of agricultural pesticide. Where the mean % score was 26.04±2.98 pre-coaching and improved to 72.58±5.27 at immediate post-coaching and became 46.36±3.18 at 3 months post-coaching, with statistically significant relation (t=12.0, P=0.001).

A significant improvement in coachees' mean practices from pre to at 3 months post-coaching regarding different phases of handling of agricultural pesticide (before, during and after handling pesticide) is revealed in table (6). A significant improvement in the coachees' total mean practices scores of safe handling of agricultural pesticide where the mean % score was 10.98±3.20 pre-coaching and improved to 19.76±7.12 at 3 months post-coaching, with statistically significant relation (t=6.71, P=0.001).

Table (7) displays the observed coaching skills process exercised in program. Regarding immediate-post coaching, their ability to focus; the mean score of the coachee was 8.22±2.65 who agreed that the coach greet them, 7.62±3.12 who agreed that the coach determine what coachee knows before start, 7.01±2.65 who agreed that the

coach encourage questions, 7.92±2.87 who agreed that the coach share an overview of the job to be taught and 7.01±2.33 agreed that the coach discuss program safety consideration. These were improved at 3 months post-coaching to be 9.34±1.25, 8.36±2.12, 6.11±0.62, 7.91±1.23 and 8.71±4.23 respectively.

As regards to immediate-post coaching and the ability of coach to explain and demonstrate; the mean score of coachee was 7.09±3.25 who agreed that the coach explain the step (s) during coaching, 6.5±2.65 who agreed that the coach explain why, when and how to do, 7.01±3.01 who agreed that the coach demonstrate how to do and 6.98±2.65 who agreed that the coach had encourage questions. These were improved at 3 months post-coaching to be 8.39±1.23, 8.7±3.55, 8.71±4.12 and 7.58±3.25 respectively.

Concerning to immediate-post coaching and the ability of coach to observe; the mean score of coachee was 6.82±1.98 who agreed that the coach observe that coachee verbally walk through step during coaching, 6.98±2.11 who agreed that the coach select a safe observation location, 6.98±2.66 who agreed that the coach observe that coachee explain each step and then

Table 7: Distribution of coachee regarding observed coaching skills process (n= 30)

Items	Coachee			
	Immediate post- coaching		3 months post- coaching	
	Mean±SD		Mean±SD	
Step 1: Focus				
• Greet coachee	8.22±2.65		9.34±1.25	
• Determine what coachee knows	7.62±3.12		8.36±2.12	
• Encourage questions	7.01±2.65		6.11±0.62	
• Share an overview of the job to be taught	7.92±2.87		7.91±1.23	
• Discuss program safety consideration	7.01±2.33		8.71±4.23	
Step 2: Explain and demonstrate				
• Explain the step (s)	7.09±3.25		8.39±1.23	
• Explain why, when and how	6.5±2.65		8.7±3.55	
• Demonstrate how	7.01±3.01		8.71±4.12	
• Encourage questions	6.98±2.65		7.58±3.25	
Step 3: Observe				
• Have coachee verbally walk through step	6.82±1.98		7.01±1.09	
• Select a safe observation location	6.98±2.11		9.00±4.27	
• Have coachee explain each step and then demonstrate it	6.98±2.66		8.31±2.05	
• Observe coachee demonstrating job	7.28±3.12		8.55±3.22	
Step 4: Feedback				
• Ask coachee to do a self-assessment	7.23±2.33		8.66±1.43	
• Give feedback on performance	8.01±3.01		8.55±3.01	
• Assess your coaching progress	8.11±2.65		7.63±2.71	
Step 5: Higher level of management				
• Establish coachee's readiness for evaluation	6.58±2.08		8.09±2.16	
• Make arrangements for evaluation	7.11±2.65		7.38±2.05	
• Based on outcome of evaluation, consider the next step	6.99±3.05		7.55±2.43	
Total scores of coachee' observed coaching skills:	No.	%	No.	%
• Unsatisfactory coaching skills score % <75%	5	16.7	9	30.0
• Satisfactory coaching skills score % =75%	25	83.3	21	70.0
Mean ±SD	43.2±11.03		76.5±19.25	
	t =6.25 0.001*			

t: Independent sample t-test *Significant at P=0.05

demonstrate it and 7.28±3.12 who agreed that the coach observe coachee demonstrating job. These were improved at 3 months post- coaching to 7.01±1.09, 9.00±4.27, 8.31±2.05 and 8.55±3.22 respectively.

Relating to immediate-post coaching and the ability of coach to attain feedback from coachee; the mean score of coachee was 7.23±2.33 who agreed that the coach ask them to do a self-assessment, 8.01±3.01 who agreed that the coach give feedback on their performance and 8.11±2.65 who agreed that the coach ask them for assessing their coaching progress compared to 8.66±1.43, 8.55±3.01 and 7.63±2.71 respectively at 3 months post-coaching.

Pertaining to immediate-post coaching and the ability of coach to achieve higher level of management; the mean score of coachee was 6.58±2.08 who agreed that the coach establish coachees' readiness, 7.11±2.65 who agreed that the coach make arrangements for evaluation of coaching process and 6.99±3.05 who agreed that the coach consider

the next step during coaching progress based on outcome evaluation. These were improved at 3 months post-coaching to 8.09±2.16, 7.38±2.05 and 7.55±2.43 respectively.

In addition, Table (7) demonstrates the total mean scores of coachee' observed coaching skills differs from immediate to 3 months post- coaching regarding different steps and enhanced from 43.2±11.03 to 76.5±19.25, with statistically significant relation (t=6. 25, P=0. 001).

Table (8) shows that the relationship between coachee' socioeconomic data and knowledge, practices and coaching process regarding safe handling of pesticides. The table reveals that the mean scores of knowledge, safe handling of pesticides practices and coaching skills increased with age categories from 18 to less than 34 years. This difference was statistically significant for coachees' age, where knowledge (ANOVA= 18. 2, P= 18. 2), safe handling of pesticides

Table 8: Relation between coachee' knowledge, safe handling of pesticides practices and coaching skills process and their socioeconomic data

Items	Knowledge	ANOVA P	Practice	ANOVA P	Coaching skills	ANOVA P
Socio-demographic characteristics						
Age (year):						
18 -	82.6±7.21	18.2 0.013*	26.5±2.36	14.2 0.023*	76.1±8.2	12.88 0.005*
26 -	72.3±4.65		27.6±3.2		78.9±6.98	
34 - 40	61.3±5.22		25.6±3.1		68.2±10.2	
Gender						
Male	78.9±5.21	t=3.25 0.014*	19.8±2.6	t=4.01 0.011*	82.6±10.2	t=4.25 0.003*
Female	69.2±6.11		26.8±5.62		68.2±9.85	
Educational level:						
Basic education	58.6±2.69	22.1 0.001*	18.2±3.65	20.1 0.002*	65.8±12.2	10.98 0.017*
Preparatory	64.2±4.11		20.1±3.01		71.6±10.8	
Secondary	74.3±4.21		23.6±4.3		77.6±9.85	
University or higher	77.2±6.21		28.6±3.2		88.9±7.85	
Marital status:						
Single	72.6±6.25	3.25 0.14	22.6±4.12	4.01 0.32	82.6±9.58	9.58 0.026*
Married	74.2±5.1		21.8±3.65		75.2±8.69	
Divorced	76.2±6.1		24.6±4.6		72.6±10.2	
Widow	72.3±5.6		22.4±3.6		70.2±9.85	
Occupation:						
Housewife (handling of pesticides at home)	61.2±6.98	t=8.5 0.001*	18.9±2.32	t=6.2 0.003*	84.2±10.6	t=4.25 0.002*
Farmer	67.2±6.89		19.2±3.98		74.2±9.85	
Pesticides dealer	72.6±7.25		20.1±4.21		79.2±11.2	
Crop advisor	79.2±6.2		27.2±3.25		76.8±9.58	
Family income:						
Enough	70.2±6.98	16.2 0.009*	21.2±3.21	14.25 0.002*	71.6±10.7	14.8 0.0021*
Not enough	68.9±7.12		24.3±3.98		68.9±8.98	
Enough and saved	80.3±8.2		26.8±4.2		86.8±11.2	

t: Independent sample t-test F: One Way ANOVA test *Significant at $P \leq 0.05$

practices (ANOVA= 14. 2, P=0. 023) and coaching skills (ANOVA= 12. 88, P=0. 005). In addition, the mean scores of knowledge and coaching skills were higher in male than female, however safe handling of pesticides practices was more frequently observed in female. This difference was statistically significant for gender, where knowledge (t=3. 25, P=0. 014), safe handling practices (t=4. 01, P= 0. 011) and coaching skills (t=4. 25, P=0. 003).

The table also displays that the mean scores of knowledge, safe handling of pesticides practices and coaching skills were higher among university education. This difference was statistically significant for coachee educational level, where knowledge (ANOVA= 22. 1, P=0. 001), safe handling practices (ANOVA=20. 1, P=0. 002) and coaching skills (ANOVA= 10. 98, P=0. 017). Furthermore, the mean scores of coaching skills were higher in single coachee, however safe handling of pesticides practices and level of knowledge were more frequently observed in divorced coachee. This difference was statistically significant for coachee marital status and coaching skills (ANOVA=9. 58, P=0. 026).

The table conveys that the mean scores of knowledge, safe handling of pesticides practices

increased with different types of coachee occupation versus to coaching skills which increased only among housewife. This difference was statistically significant for coachee occupation, where knowledge (t=8. 5, P= 0. 011), safe handling of pesticides practices (t=6. 2, P=0. 003) and coaching skills (t=4. 25, P= 0. 002). The table also illustrates that the mean scores of knowledge, safe handling of pesticides practices and coaching skills were higher among those coachee have enough income and saved. This difference was statistically significant for coachee income, where knowledge (ANOVA= 16. 2, P=0. 009), safe handling practices (ANOVA=14. 25, P=0. 002) and coaching skills (ANOVA= 14. 8, P=0. 0021).

DISCUSSION

Agricultural experts and some scientists believe that without pesticides, the production of crops would decrease about 35 percent almost immediately[23]. Pesticides provide important benefits when used correctly. However, they can cause serious harm if used improperly. Previous literature on potential health effects of pesticides first focused on the risks of acute

intoxication among people with direct exposure. The availability of longitudinal data shifted the main concern to the risks of chronic intoxication and environmental contamination [24, 25].

Worldwide, about 25 million agricultural workers experience unintentional pesticide poisonings each year and it is estimated that approximately 1.8 billion people engage in agriculture and most use pesticides to protect food and commercial products that they produce [26]. Different risks associated with pesticides are often classified based on whether they have short-term effects (such as diarrhea, abdominal pain, headaches, nausea, vomiting, etc.) or long-term effects (such as skin diseases, cancer, depression, neurological deficits, diabetes, genetic disorders, or even death) [24].

Acute effects occur shortly after exposure, usually within 24 hours. Some pesticides produce acute toxic effects because of their corrosive or irritant properties. These can result in respiratory, skin, or eye irritation or damage [27]. Participants of the current study reported occurrence of acute pesticides' side effect as shortness of breath was 56.7%, followed by itchy eyes which reported by half of participants. Skin irritation and stomach ache were reported by 46.7 and 26.7% compared to 23.3 and 23.3% for nausea and coughing respectively. These health effects are different depending on the degree and the type of exposure. This result is consistent with Oluwole and Cheke work [28] who stated that their interviewed farmers reported multiple health effects such as nausea, headache, vomiting, eye irritation and skin problems and they considered these symptoms as common phenomena and had attributed them to fatigue and tiredness after working in the field. So, it is now better to understand that wearing PPE can reduce the potential for dermal, inhalation, ocular and oral exposure, this lowers the chances of pesticide injury, illness, or poisoning [27, 29].

In general, the effects are different for farmers who are directly exposed to pesticides, compared to those for farmers' relatives or people living in rural areas who are less directly exposed [24]. The present study showed that, 23.3 and 26.7% of participants reported that those less than 5 years and those above 60 years were the highest age at risk of exposure to pesticides respectively, where 60.0% of them had direct contact with pesticides for less than 2 years. This finding is congruent with Oluwole and Cheke work [28] who reported that the majority (91.3 percent) of farmers stated that they or someone in their family

had suffered from pesticide-related health symptoms during or after application of pesticides. In addition, Balen *et al.* [30] also stated that children are particularly vulnerable to exposure and health effects.

The present study revealed that as much as (76.7%) of the participants were in the age group 18-<34 years and one third of them were females. More than one fourth of them (26.7%) were housewife which handling of pesticides at their homes, while the rest work in farm and half of them had previous history for abortion. This result is in agreement with Arbuckle *et al.* [24] suggested an increased risk of fetal deaths associated with pesticides and maternal employment in the agricultural industry.

Any person applying or handling pesticides or working in pesticide treated areas must be knowledgeable about the safe use and handling of pesticides. Everyone must use safety equipment specified on pesticide labels [31]. Those working with pesticides need to know about occupational pesticide exposure and health risks, both for themselves as well as people living in the vicinity of places where pesticides are used [32]. The present study revealed a significant improvement in the participants' total mean knowledge scores of safe handling of agricultural pesticide where the mean % score was 26.04 ± 2.98 pre-training and improved to 72.58 ± 5.27 post-training, with statistically significant relation. This result is consistent with the Federal Worker Protection Standard of 1992 that for set both handlers and workers, the standard requires training, notification and information on the proper use of protective equipment. Handlers include those who apply, load, mix, transport, clean and repair pesticide application equipment, etc. Workers include persons who may physically come in contact with pesticides in treated areas while performing tasks related to production and harvesting. Both need to be trained on the recognition of pesticide poisoning symptoms, how to avoid exposure and emergency assistance, as well as, be provided personal protective equipment and transportation for medical assistance. While, handlers need additional training [31].

The correct use of pesticides is critically important. Too much of a chemical may damage or kill the plants or animals it was intended to protect, while too little may not provide adequate pest control. Many desirable plants and animals, including humans, can be harmed by the incorrect or careless use of pesticides. We must use them wisely, properly and safely [23]. Pesticides need to be handled, used and disposed of appropriately, in order to

minimize risk to human health and the environment [33]. The WHO [3] has recommended the use of pesticides only by trained people. Basic objective of the proper training or education on proper use of pesticides is to ensure that farm workers understand the health hazards of relevant pesticides, use protective equipment properly, practice personal hygiene measures, become familiar with and adopt proper work practices, recognize early symptoms of overexposure to pesticides and obtain first aid at the earliest time possible [3].

The present study revealed a significant improvement in participants' mean practices from pre to post-training regarding different phases of handling of agricultural pesticide (before, during and after handling pesticide). A significant improvement in the participants' total mean practices scores of safe handling of agricultural pesticide where the mean % score was 10.98 ± 3.20 pre-training and improved to 24.68 ± 5.73 post-training, with statistically significant relation. In contrast to Oluwole and Cheke work [28] who indicated that the farmers were well aware of possible health effects of pesticides, but their actions implied that they did not adjust their practices accordingly. This is also a common practice among farmers in Benin, Ethiopia, Ghana and Senegal [34] where African studies frequently highlight poor pesticide practice. This demonstrates that while farmers were not ignorant of pesticide hazards, they continued to carry out hazardous practices in the field and at home. Negligible use of protective clothing, pesticide storage in bedrooms, granaries and kitchens and use of empty insecticide containers to store food or drink was common.

The professional practice of coaching is still maturing. The perceptions of the effectiveness of coaching differ widely. It is clear that coaching has an impact on people and the individual coaching program has been a valuable investment [35]. The present study revealed a significant improvement in the total mean scores of coachee' observed coaching skills which differs from immediate to 3 months post-coaching regarding different steps and enhanced from 43.2 ± 11.03 to 76.5 ± 19.25 , with statistically significant relation ($t=6.25$, $P = 0.001$). These results are compatible with Burke and Day [35] in their meta-analysis of management training and development programs who reported that coaching is at least three times more effective than the typical training program in producing results.

In a perfect world, the evaluation process is integrally connected to the implementation process and both are driven by clear purpose and design [36]. Consequently, coaching facilitates the development of skills which

positively affects both the individual participant and the overall community. This was contrary to Peterson's study, where no significant change when measured at the completion of coaching or at follow-up 1 to 2 years later.

CONCLUSIONS

Based on findings of the present study, it could be concluded that the study hypothesis is accepted where the coachees who receive community coaching program exhibit higher scores of coaching skills, knowledge and practice about safe handling of agricultural pesticides after the program than before it. It was clearly that majority of coachees had a significant improvement in their total mean scores of coaching skills, knowledge and practices of safe handling of agriculture pesticides after program than before.

Recommendations:

- More research is needed to analyze the potential health effects of pesticides on people with indirect exposure.
- Expend the role of mass media related to community based education for the all farm worker about safe handling of pesticides.
- Government should intensify efforts aimed at registering and controlling distribution of pesticides and banning hazardous ones.
- Farmers need regular training to encourage appropriate practices for safe use and handling of chemicals and pesticides by educating them about the risks involved in the misuse and abuse of these poisonous materials.
- Anyone under 18 years old are prohibited from being a pesticide handler or doing early-entry work.
- People living in houses bordering agricultural land should have a legal right to be notified in advance of any pesticide spraying operations.
- In preconception and prenatal phase, counsel to reduce pesticide exposure and help reduce negative birth outcomes, neurodevelopmental problems and childhood asthma associated with prenatal pesticide exposure.
- Educate patients in occupations at high risk of pesticide exposure about the health effects associated with these exposures; identify patients, such as those with asthma or COPD, who may have special vulnerability to pesticide exposure.

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