

International Cooperation Initiative
by MINISTRY OF EDUCATION, CULTURE, SPORTS,
SCIENCE AND TECHNOLOGY(MEXT) - JAPAN

Community-Based Health Professions Education Module Incorporating Sustainable Development

Examples of Good Practices

Version 1.0

March, 2010

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This project is supported by International Cooperation Initiative by MEXT
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Case 1

Collaborative Field Training in Medical Education

Khon Kaen University (KKU), Thailand

Thailand established the primary health care oriented medical education. Khon Kaen University (KKU) has been running excellent program of community based medical education. Field training is essential for the community based medical education. Community is the suitable place to learn the concept of the sustainable development. Department of community medicine of KKU organized the whole program and evaluated the students' feedback (surveyed after the 10 days of the practical work).

Target of the students

The Collaborative Field training is prepared for the 3rd year medical student (pre clinical year) and other health related disciplines (associated medical technology, veterinary medicine, nursing and dentistry) at Khon Kaen University.

Objectives

To enable students to gain experience in working together, gain knowledge and gain a good attitude toward the community and working in the community, through the process of studying the community and working in the community.

Structure of the course

During the course of the training the whole class of 280 students will stay in a rural village for 10 days working along with other students from other health related sciences. During these ten days the student will have to study the way of lives in a rural village intensively both in a qualitative way and quantitative way. By doing this they will have a chance to understand all components; social, economic, and environmental. They will have to work with community leaders to solve a problem in the community. During these meeting with the community leaders the student will present to the community about what they have learned. The community will have a chance to clarify and make some adjustment to the student's understanding. This will create a better understanding both for the students and the village. The community will have the opportunity to see another view of their community through the eye of the outsiders. The students will be able to clarify some of their misconceptions as well. Then the whole assembly will use this information to create a short term community activities. During the planning of the activities the issues regarding socially acceptance, economical feasible or environmental friendly will come up. The students and community will have a chance to work with and discuss these sustainability development concepts in their meeting. Seven anthropological tools (*) for the community diagnosis are recommended to use in the program.

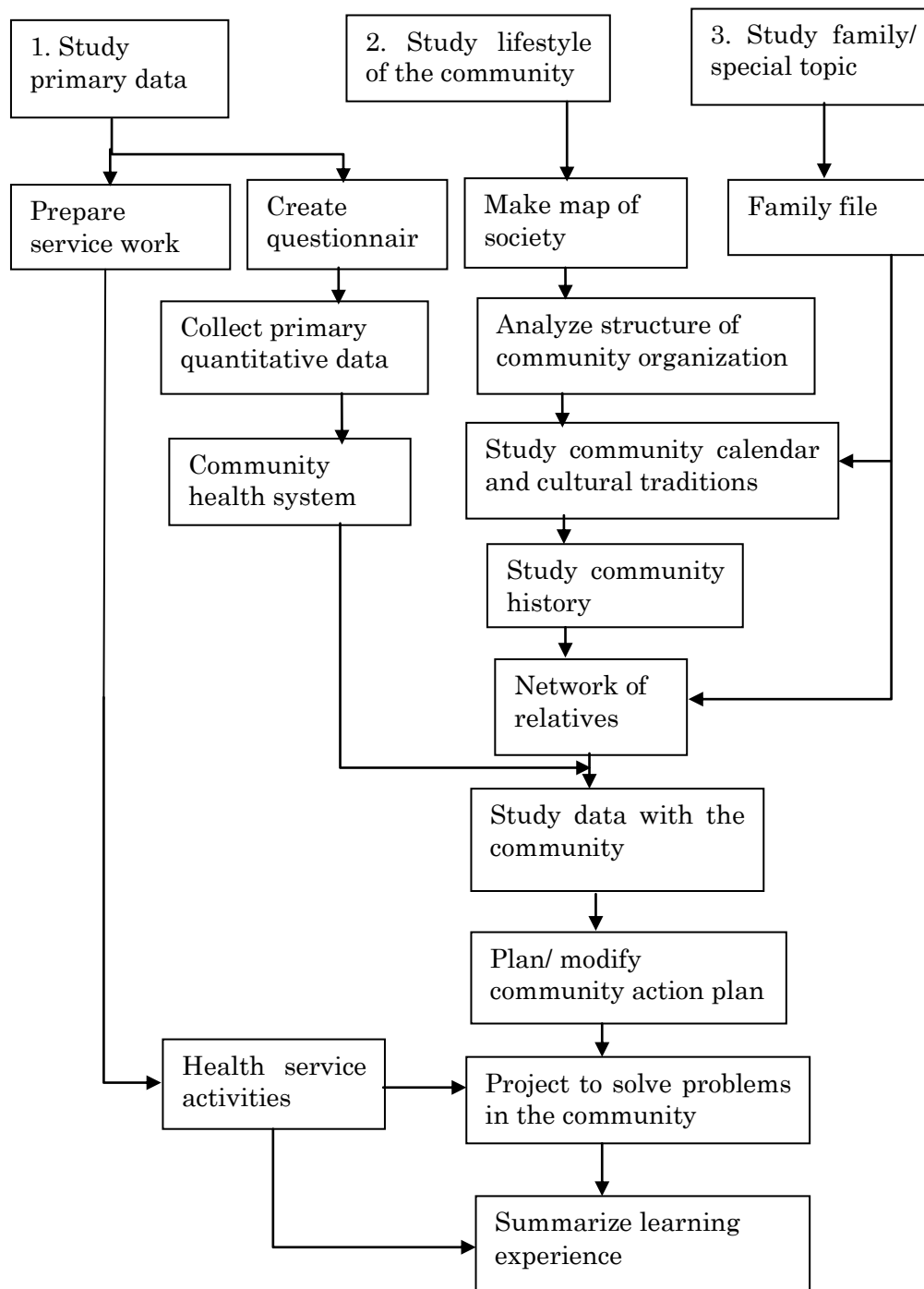
*Anthropological Tools for Community Study (Dr. Komatra)

- 1) Geo-social mapping
- 2) Genogram
- 3) Community Organization
- 4) Local Health systems
- 5) Community Calendar
- 6) Local history
- 7) Biographies: Life stories

Before the students start the program at the community, faculties gave an introductory lecture to the students, logistics, transportations, food and accommodations, security, cultural sensitivities and ethical issues of information/privacy.

This is a flow chart showing how each component of the activities fit together.

Process of learning experience



Expected Outcome of the program

- 1) Students gain good skills from working in the community with the population, leaders and related officials.
- 2) Students can efficiently provide service and develop the health of the community using their professional skills in the future.

Assessment

During a 21 day working at community, each team of students have to make a report of their works in the community and present to villagers and submit to teacher at UHS. The reports consist of three parts: 1) group's management Logbook, 2) Individual management look book and 3) community report of whole activities. (anex1)

Students' feedback

- 1) Students gain good skills from working in the community with the population, leaders and related officials.
- 2) Students can efficiently provide service and develop the health of the community using their professional skills in the future.

***See "7 anthropological tools in Teacher guide booklet"**

**** See the Appendix 1: "Program and students' community field work Khon Kaen University (KKU)"**

Case 2

Lao Community Health Field Work Project, The 5th year Medical, Dentist and Pharmacy Students

University of Health Sciences (UHS), Lao PDR

Background

Health policy is one of the Eight National Socio-Economic Priority Program of the Lao PDR. The Lao Health Master Plan calls for an integrated, effective, sustainable system to address basic needs and primary health care aiming at increasing the service coverage throughout the country. There are many opportunities to improve the country's health situation or to reduce the mortality and morbidity rate of Lao people. The University of Health Sciences (UHS) is the core actor and is one of the most suitable institutions to make the government goal real.

Community health fieldwork is one part of the powerful curriculum of learning and teaching of University of Health Sciences to train students with knowledge and skill on community health development work and to familiarize them with community situation before graduation and becoming a good health staff who understanding truly the health problem of local people. Moreover, good understanding of people's and country's health situation is a must for all new graduates. They have to understand the real living situation of people living in rural and remote areas and have to learn various approaches used to overcome difficulties encountered around the health issues of those people. Therefore, capacity building is connected to direct learning at the local level. The future medical doctors have opportunity to practice their knowledge acquired from classroom and working as a team in a circumstance with poor medical resourced facilities.

Goal of the Project

The development of an appropriate training curriculum to improve the capacity, skills and moral of the future graduated students is a requirement. Thus, the main aim of our university are:

To provide an opportunity for students to develop and improve their knowledge and skill on community health development work and together with give assistance community as well as learning with community.

Objectives

At the community level, students must:

- a. Immerse into the community by meet with community leaders and mingle with local people.
- b. Seek for the health problems by implementing a community health survey and analyzing data in order to diagnose community problems.
- c. Identify a range of priorities related to people's health in communities.
- d. Make community intervention and participatory planning to solve health problems by setting up project implementation.
- e. Conduct the community health solving project by provision for local people with basic knowledge on primary health care.
- f. Influence communities to change their behaviours and way of life and increase people's awareness in preventive rather curative approaches to health care.
- g. Provide on the job training to health volunteers, particularly in basic diagnostics and treatment.

- h. Monitor implementation of planned activities at the community level on regular basis for villages.
- i. Live and work with local people with different cultures, languages and with minimum livelihood opportunities and health facilities.
- j. Document lessons learnt and experiences from living and working with remote communities.
- k. Write a community report.

Location and Targeted Villages

Characteristic of targeted villages of the project are based on agreement between university and provincial administrators or local authorities. Most of villages are poor health condition setting and undeveloped of district or the province.

Duration of the Project

Community health fieldwork is a three year project continuously. Each year, students have to work at the communities for one months. However, their activities have still been processed by communities people.

Responsible Institution,
Community Medicine, dentistry and pharmacy departments, UHS.

Approved by
The president of UHS

*See the Appendix 2: “Students’ report of University of Health Sciences”

Case 3

Community Based Health Professional Education

Muhimbili University of Health and Allied Sciences (MUHAS), Tanzania

Background

Tanzania is located in Sub-Saharan Africa and is among the five countries that form East Africa. According to the 2002 population census, it has a total population of about 35 million of which 74% is rural. The country has seven medical training Universities/Colleges of which two are public. Muhimbili University of Health and Allied Sciences is the biggest and oldest public institution training health professionals at degree level. Human resources for Health in the country are still scarce. The training institutions have been training students on community based Health profession Education in line with the national policy on self sufficiency. However the concepts of education for sustainable development have not been adequately understood by both faculty and students due to lack of guidelines and manuals. As results the benefits of interdisciplinary approaches in the working environment are adequately achieved. Streamlining curriculum content will enable inclusion of the interdisciplinary approach and education for sustainable development thus comes up with professionals ready to work with community for the community. The end products will demonstrate the pillars of ESD that are environmental, economical and cultural acceptability.

Target students

All MUHAS students (Medical students, BSC Environmental Health, Doctor of Dental Surgery, BSc Nursing, Bachelor of Pharmacy, Bachelor of Medical Laboratory and Bachelor of Radiology) are trained in CBHPE. The school of Public Health and Social Sciences takes a leading role in training these students during the first two years. With exception of MD and Environmental Health Sciences courses the subsequent years of training for the rest of courses is taken over by the respective schools, which now continue with the Community Based Research.

Objectives of the programs

Build student competencies in:

- 1) Applying epidemiological methods in diagnosing and studying the health of communities in relation to ecological, socio-economic, cultural and political factors.
- 2) Describing and applying practical methods and programs for the control of major health problems.
- 3) Acquiring practical knowledge and understanding of the structure and organization of medical services.
- 4) Applying practically the appropriate methods and procedures of administration and operational managements.

Structure of the program

For the MD program, the CBME is taught through 1st to 4th school year out of 5 year MD program.

Semester 1 and 2: Sociology and Biostatistics (Semester)

Semester 3 and 4: Family case studies (10 weeks), epidemiology and nutritional research(4 weeks)

Semester 5 and 6: Communicable disease control program (4 weeks)
Semester 7 and 8: Community medicine rotation (12 weeks)
Semester 9 and 10 Clinical training in the wards under the School of Medicine

CBME for MD program is offered in the form of
Lectures, seminars, field practice
Community/site visits-including health facilities, national health programs, water treatment sites, waste disposal areas

Each Student has an opportunity to visit the community (primary school, dispensary, water source, and garbage dumpsite) and observe the life of the people. They also assess determinants of health at the community level, which include

- 1) Socio-economic
- 2) Food security
- 3) Water and sanitation
- 4) Other environmental and occupational determinants
- 5) Behavior
- 6) Health services

It is a good opportunity for the student to think about the possible solution that people can sustain in the community such as: How can they obtain safe water in the community? How can they get nutritious food in the household? Etc. Students are expected to realize that sustainable development is needed to solve the health problems in the community*.

BSc Environmental Health Sciences

The program is offered in six semesters in which CBHPE is taught throughout all courses as follows:

Semester 1 and 2 Development sciences, biostatistics and sociology

Semester 3 and 4 Epidemiology and research methods

Semester 5 and 6 Community Based activities and Research

These are students registered by School of Public Health and Social Sciences and all their activities aim to ensure that they practice to protect and improve the health of a community, as by preventive medicine, health education, control of communicable diseases, application of sanitary measures, and monitoring of environmental hazards.

***See the Appendix 3: “Community-Based Research (CBR), 5th year medical student report of Muhimbili University of Health and Allied Sciences (MUHAS)”**

Case 4

Community-Based Research (CBR), The 2nd year Medical Students

University of Sharjah, United Arab Emirates (UAE)

Community-Based Research

In Community-Based Research (CBR), students will undertake a year long group research on a health promotion based topic that will help to form the basis for students' understanding and appreciation of the importance of research in understanding, maintaining and enhancing health of the individual and community at large.

Early in the **first semester**, students will be assigned to work in groups of five or six members per group to develop a research topic of interest in relation to Health Promotion, refine the topic and formulate it into a workable plan and have the plan reviewed for ethical approval.

Each group will identify a topic indicating its importance and impact on health. This should culminate in defining focused clear objectives or researchable questions. i.e. feasible within the available time and resources. The workable plan of every group's research will be reviewed ethically and methodologically and should be approved.

In the **second semester**, research groups will do the field work. This year-long project will culminate in preparing and presenting a research poster.

Students will develop skills in communicating their research work orally, visually, and in written form to fellow students, and faculty.

Family Health Program (FHP)

The Family Health Program (FHP) introduces medical students to the focal point of the community “the Family”. Despite the major societal changes in the gulf, the family remains the basic social unit of the community.

Primary, secondary and tertiary health care are concerned about illnesses and diseases, while family health extends beyond illness orientations. Family health comprises the interactions that occur within a household environment, affect family members as they seek to obtain, sustain and regain maximum health. It also includes the relationships and processes between the family, health care providers, social services and socio-economic systems. The latter have potentials to maximize and enhance the well being of the family.

Family health is an important component of the Community Medicine Programme. It allows students to learn about how families' work, how they cope with life events, illnesses and social difficulties. It also helps students to appreciate community experience and to understand the importance of this in the context all family members' health. Moreover, the students learn about the effective delivery of health care. It is an opportunity for students to study the relationship between family health issues and social environment, and to understand the social network available to the family.

*See the Appendix 4: **“Students’ research project of University of Sharjah”**

Case 5

Collaboration of Non-governmental Organizations (NGO)

Okayama University Medical School and Graduate School of Environmental Sciences collaborate with TICO, Japan

Japan is the developed country and health standard is high. The life expectancy age is over 80 yrs. Due to the low fertility rate and aging, the populations are decreasing and the rural community are facing crisis of the community itself. The sustainable development is highly required for the society of Japan. Medical professions of Japan need to learn ESD for the future society. Department of public health, Okayama University medical school and graduate school of Environmental Science organize field visit program of the community health and international health in collaboration of TICO (Tokushima International Cooperation Organization) , NGO that is located at Tokushima and run the programs of the sustainable development of Zambia and Cambodia. Dr. Osamu Yoshida is a founder of TICO and he runs his own clinic (Sakura-clinic) at Yamagawa, Tokushima, Japan. He is promoting sustainable community both at Tokushima and Zambia. It is the good opportunity for the students to learn the concept and practice the sustainable development in the community.

Target of the students

4th year medical students.

Objectives of the program

- 1) Understand the role of Non-governmental Organization for the international development
- 2) Learn the linkage of the health problems and food/agriculture in the remote community
- 3) Understand the importance of the Education for Sustainable Development (ESD)

Structure of the program

Students choose the topic of the program and small group (3-5 students) will visit the field sites. Length of the program is 3 days.

- 1) Orientation of the course and lecture on ESD
- 2) Trip from Okayama to Tokushima
- 3) Seminar of International health, Kominkan/Community Learning Centers (CLCs) and ESD
- 4) Farming exercise at the farm located near the hospital to prepare the food for the hospital (Local production and local consumption)
- 5) Understanding the International health issues-case of Zambia (HIV/AIDS, poverty and tropical disease etc.) through the seminar and learning materials of card game. The students can learn the poverty, health problems (HIV/AIDS, Tuberculosis, and Malaria) and other social issues through this card game (Life in Zambia).



Fig1: Exercise of farming at the farm of the clinic (left)



Fig2: Harvest of vegetables will be utilized for the food of the inpatient ward (right)



Fg3: Seminar on ESD for the community people
(By Dr. Yamamoto)



Fig 4: Learning materials of Card game on Life of Zambia
(Photo by Mr. Goh Kimoto)

Students' response and feedback

- Before the program, we could not understand why International cooperation program was done from the remote area of Tokushima since I understand that international aid is done at Tokyo. Through the program, we realized the importance of the “sustainable development” as the key of the international development. TICO is trying the challenging attempt.
- After we completed this program, we realized that we need to cope with our earth and our future. We need to take some actions. It is not enough just thinking about the crisis of our society. We need to create the sustainable society both in the developing countries such as Zambia and also developed countries like Japan. We could learn ESD well after we participated in this program.

Appendix 1

Program and students' community field work
Khon Kaen University (KKU)

Overview

The Collaborative Field training is a course for third year medical student at Khon Kaen University. The third year is considered to be the non-clinical year. Objectives of the training are as followed.

To enable students to gain experience in working together, gain knowledge and gain a good attitude toward the community and working in the community, through the process of studying the community and working in the community.

During the course of the training the whole class of 280 students will stay in a rural village for 10 days working along with other students from other health related sciences. During these ten days the student will have to study the way of lives in a rural village intensively both in a qualitative way and quantitative way. By doing this they will have a chance to understand all components; social, economic, and environmental. They will have to work with community leaders to solve a problem in the community. During these meeting with the community leaders the student will present to the community about what they have learned. The community will have a chance to clarify and make some adjustment to the student's understanding. This will create a better understanding both for the students and the village. The community will have the opportunity to see another view of their community through the eye of the outsiders. The students will be able to clarify some of their misconceptions as well. Then the whole assembly will used this information to create a short term community activities. During the planning of the activities the issues regarding socially acceptance, economical feasible or environmental friendly will came up. The students and community will have a chance to work with and discuss these sustainability development concepts in their meeting.

Operation of activities for the year 2009

Activities from March to November 2009

Activities of the Collaborative Field Training Project Committee (March – September 2009)

- Prepare the site of the Collaborative Field Training Project
- Specify the form of the Collaborative Field Training Project, prepare equipment and tools for each division including producing the manual, academic information, essential educational aids for in the field and evaluation material.
- Locate lecturer heads for each area and lecturer activity advisors/ lecturer village advisors
- Train lecturer heads for each area and lecturer activity advisors/ lecturer village advisors
- Hold orientation for students and general academic lectures
- Students enter areas to survey accommodation and collect information to hold activities to serve the community.
- Students prepare equipment, collect, process and analyze primary data to diagnose the community health with village leaders and villagers.
- Students prepare tools and equipment related to the Collaborative Field Training Project.
- Meeting to inform lecturers and students before leaving for the project area.

Implementation of the Collaborative Field Training Project at the Project site (12th October – 22nd October 2009)

- Presentation of the results of the Field Training at Khon Kaen University by students (31st October 2009)
- Evaluation and conclusion of the Collaborative Field Training Project (November 2009)

Calendar of Activities for the Collaborative Field Training Program, Khon Kaen University, 2009 academic year.

Date	08:30-12:00	13:00-16:30
<i>11th July 2009</i>	<i>Orientation for students and lecturer advisors</i>	<i>Sub group meetings for students, lecturer advisors and lecturer area heads</i>
<i>12th July 2009</i>	<i>Academic lectures</i>	<i>Students meet lecturer area heads and area lecturers to discuss collecting primary data</i>
<i>18th July 2009</i>	<i>Student representatives collect primary data <u>part 1</u> survey accommodation and make detailed maps of the villages</i>	
<i>19th July 2009</i>	<i>General student meeting to analyze data and find preliminary problems</i>	
<i>8th August 2009</i>	<i>Student representatives meet villagers and the community and collect additional primary data <u>part 2</u></i>	
<i>9th August 2009</i>	<i>Students meet area lecturers to make field data collection instruments and arrange service activities</i>	
<i>29th August 2009</i>	<i>Students test instruments</i>	
<i>5th Sept. 2009</i>	<i>Students meet area lecturers to modify instruments and find form of activities for villager involvement</i>	
<i>Friday, 9th October 2009</i>	<i>Meeting with students to provide details before field training</i>	<i>Representatives collect materials, equipment and bedding</i>

<i>Monday 12th – Thursday 22nd October 2009</i>	<i>Collaborative Field Training Project in the village</i>	
<i>25th October 2009</i>	<i>Students meet area lecturer advisors to prepare reports and presentations about Collaborative Field Training Project</i>	
<i>31st October 2009</i>	<i>Students present about the Collaborative Field Training Project</i>	<i>Evaluation of the Collaborative Field Training Project</i>

Joint meetings at main meeting hall, Faculty of Veterinary Medicine

Calendar of field work for the Collaborative Field Work Project 2009

Date	Activity
<i>12th October 2009</i>	<i>1. Travel to village to meet house owners and family members 2. Survey the general condition of the community. Meet with villagers. 3. Introduce yourself to the community. 4. Survey the area of responsibility of the house.</i>
<i>13-14th October 2009</i>	<i>1. Collect primary data (basic data and lifestyle in the community) 2. Survey study families and special study topics to introduce area lecturer advisors</i>
<i>15-17th October 2009</i>	<i>1. Analyze quantitative study data 2. Students summarize health problems and rank problems 3. Present summarized data to the community members, and perform group process activities (AIC). 4. Draft a community plan with the community and rank problem projects. 5. Support/ coordinate/ join in activities with the community in implementing plans. 6. Study families/ special study topics 7. Summarize community lifestyle.</i>
<i>18th October 2009</i>	<i>- Present about the community lifestyle in the area</i>
<i>19-20th October 2009</i>	<i>- carry out prepared service activities</i>
<i>21st October 2009</i>	<i>1. Summarize work and present in the village 2. Carry out activities with villagers 3. Send report to village lecturer advisor</i>
<i>22nd October 2009</i>	<i>Travel back to University (morning)</i>

- * NB
- Activities to create bonds with villagers take place throughout the training
 - Writing daily records to be presented to the village lecturer advisor every two days
 - Activities from 15th-20th October can be swapped around according to what is appropriate in each area

Table showing overview of activities, objectives, results and student work.

Activity	Activity objective	Instruction for students	Time	Student work	Outcome
Activity 1 Quantitative data study	1. To be able to study community data 1.1 Get primary data 1.2 Create and prepare data collection instruments 1.3 Collect data	1. Study community data 1.1 Study primary data 1.2 Develop instruments and collect primary data	Before and at start of training	1. Students divide work in area 1.1 Finding primary data 1.2 Making questionnaire 1.3 Collecting data 1.4 Ranking problems	- Community data from primary sources - Instruments for community study (questionnaire) - Collected community data
Activity 2 Family study	2. Understand normal lifestyle and health system of population at the family level	2. Study case study families using observation and in depth interview covering - relatives network - relation with community - social economy and way of life in the community - cultural traditions of the community related to health	Through out training	2. Study one family including writing a report	- Report family study (1 family per house)
Activity 3 Special study topic	3. Study the community life according to the interest of the group	3. Study with conversation or observation/ in depth interview	Through out training	3. Study one topic with a written report	- Report special study topics (1 topic/ village)
Activity 4 Community lifestyle study	4. Understand the way of life of the community	4. Study the community completely by group discussion and/or observation/ in depth interview - Structure of community organizations and various groups in the community - the community health system - the history of the community - Society map - Community calendar and cultural traditions - Structure of relatives	13 th -18 th October 2009	4. Study the lifestyle of the community 4.1 Students divide the tasks in their area and summarize the overall data at the village level 4.2 Students collect data in their area of responsibility	Community study data - Community lifestyle data

Activity	Activity objective	Instruction for students	Time	Student work	Outcome
Activity 5 Analyze problems and help draft community plan	5. Present data analyzing problems and draft a community plan	5. Present collected data, analyze problems and draft a community plan. Make a service plan which is in line with the village problems and suitable for the time available using the principle of community participation	15 th -17 th October 2009	- Data to modify existing community plan - Modified community plan	5. Students in each area divide work to analyze problems and make a community plan
Activity 6 Projects to solve important village problems	6. Write a project according to community plan and hold activities with the community following the plan to solve important problems in the villages	6. Support and coordinate tasks to operate according to community plan as much as possible	17 th -18 th October 2009	Project to solve village problems in association with the community	6. Students in each area divide work to carry out projects to solve community problems
Activity 7 Community service activities	7. Carry out service activities	7. Provide service according to activities prepared from the University	19 th -20 th October 2009	Service activities	7. Students in each area divide the work in order to provide service to the community
Activity 8 Forming bonds with community	8. Students and villagers work together to carry out activities	8. Students carry out activities with the population, such as - Run exercises for children in the morning and give physical education - Public address - Develop villages - Traditional activities - Recreational activities and sport	Through out training	Activities to form relationships	8. Students in each area carry out activities with the community
Activity 9 Writing daily record	9 Students learn how to write a record of their experiences and things they have learned and express them to others	9. Analyze and summarize experiences in a written form for others	Through out traing	Daily record	9. Every student keeps a personal record

How were the students being evaluated?

Individually

- A record of their experiences and things they have learned.
- A formative test evaluated the concept of community work.

Group work

- Presentation on the village life
- Report on family life
- Summary report of the activities

Examples of KKU Students' Activities in 2008 At Baan Bak Village, Roi-et Province

Key Processes

Students conducted a community diagnosis with community leaders. Community participation was a major guiding principle to ensure sustainable development. Community leaders, groups and volunteers were involved in making decisions on community issues, implementing agreed development plans, evaluating results.

A-I-C (Appreciation, Influence and Control) technique was conducted to promote authentic participation. The technique allowed participants to dream of their future by drawing picture and then share it with others. They then discussed on how to make it reality. This approach stimulated exchanges among participants and enhanced ownerships. It ensured continuous efforts and expected high outcomes.

Presentation of community health problems

The results of community assessment conducted during the first 5-6 days were also presented to the community groups. They found that pesticide contamination, diabetes mellitus, zoonosis were major health concerns. Presentations were employed through poster presentation, dialogue and facilitation of group discussions. Community groups shared their experiences and added more locally relevant information about the problems.

The processes

1. Villagers were divided into 3 small groups. Each group was facilitated to talk on 2 things: 1) What are the current major health concerns; and 2) What kind of community future they would like to see? They presented the group works in forms of drawings, text, poet or songs.
2. Students facilitated the priority setting process. Categories of the community problems include health problem; economic problem; environmental problem and social problem. Priority setting process was performed by scoring and multi-voting system.
3. Villagers' dreams on the future of community and how to make them become true (development plans) were also categorized into 3 groups: 1) plans that can be done by villagers solely; 2) plans that can be assisted by local government and 3) plans that need other government agencies supports.
4. Only 3 feasible plans were required for the time available.

Problems arising from group sharing:

Villagers identified 25 problems as follows:

Health problems

1. body ache
2. breast cancer
3. liver cancer
4. dizziness during pesticide spraying
5. Avian flu
6. respiratory symptoms among children
7. Leptospirosis
8. dyslipidemia
9. lack of physical exercise
10. stomach pain
11. eating raw fish
12. headache
13. dental caries

14. diabetes mellitus
15. dengue hemorrhagic fever
16. diarrhea
17. zoonosis
18. allergic diseases
19. foot fungus

Social problems

20. teenagers misconduct

Environmental problems

21. pesticide contamination and toxicity
22. poor air quality
23. inappropriate use of pesticide

Result of priority setting process

Three priority problems were identified:

- 1) pesticide toxicity
- 2) diabetes mellitus
- 3) dengue hemorrhagic fever

Project conducted to alleviate the pesticide problem

Villagers and students arrived at the agreed plan to reduce the effects of pesticide toxicity.

The plan details included:

Activities	Target groups	Responsible body
Group education to increase awareness of pesticide toxicity	Household head 98 persons	Students, Local government and health center personnel
Personal Protection Apparatus	98 Households	Students and Local government
Blood test for Acetyl Cholinesterase	Farmers who use pesticide in tobacco growing	Students and Health center personnel
Local production of EM (effective microorganisms) to be used as safe method of insect prevention	98 Households	Students and Local government

Lessons learned:

Well plan and cooperation among students and villagers are very essential.

Preparations of involved students from the beginning ensured deep understanding and moving into the same direction.

The training for villagers should not last more than 3 hour otherwise they will lose interests.

Public relations and campaigns are needed to involve as many as possible villagers.

Project conducted to alleviate the diabetic mellitus problem

Students found that chronic diseases such as diabetes mellitus and hypertension are common in the communities. They agreed upon a project to stimulate group aerobic exercise.

Activities	Target groups	Responsible body
Pre-test and baseline evaluation of previous experience, BMI, symptoms and attitudes toward aerobic exercise	Diabetic and general population 80 persons	Students and health volunteers
Public campaign to attract participants	community	Students and health volunteers
Conducting group aerobic exercise in the evening 17.00 – 18.00 PM	Diabetic and general population 80 persons	Students and health volunteers
Group education after aerobic exercise	Diabetic and general population 80 persons who attend the aerobic exercise sessions	Students and health volunteers
Post-test and project evaluation	Diabetic and general population 80 persons	Students and health volunteers

Lessons learned:

Ninety percent of participants were satisfied with the activities.

Ninety seven percent of them would like to continue the activities.

The aerobic exercise can stimulate health awareness and enhance social interaction among villagers

Examples of KKU Students ' Activities in 2008
Zone 2 At Baan Bak Village, Roi-et Province

Project 1: Diet for diabetes Project**Rationale**

From the secondary data, there are a large number of diabetes patients in this community. These patients can not use only medication from the district hospital but they need to have a good understanding about the disease so that they can have a proper self health care. This project's aim is to provide the patients with knowledge concerning dietary need for diabetes emphasis on hand on experience.

Objective

1. To enhance the knowledge concerning dietary need for diabetes among the project participants.
2. To enhance understanding about hygienic cooking practices among the project participants to reduce the infection rate of food borne infections.

Target

Diabetes patients 30 persons
 General audience 50 persons.

Methods

Date	Time	Activities
15 October-21 October		Announcement of the activity Recruit the contestant team for the cooking contest
21 October	15.00-16.00	Explain the contest rule and provide knowledge about proper diets for diabetes patients
22 October	9.00-10.30	Cooking time
	10.30-11.30	Taste test
	11.30-12.00	Reward ceremony

Detail of the activities

- The students will visit the diabetes patient and invite these patients or their care provider to participate in the contest.
- Each team consist of 10 members
- Each team will receive 300 Bath to buy the ingredients
- Cooking utensil and gas stove is provided by the project

Criteria for judging

Use small amount of sugar fat and salt	4 points
Hygienic cooking procedure	3 points
Good taste	2 points
Creativity	1 points

Timing 3-4 days

Budget 2500 Baht

Prize reward 1500 Baht

Ingredient 900 Baht

Announcement brochure and hanging sign 100 Baht

Project evaluation

The contestants and the observers have the knowledge about proper cooking for diabetes. Evaluate by a short quiz.

The contestants are able to cook with a hygienic procedure.

Benefit

The participants have the correct knowledge about diet for diabetes patients and are able to apply the knowledge to everyday cooking.

Project evaluation report

Summary of the knowledge 10-question quiz

Pre-test mean =6.5, Post test mean= 8.75

35 persons participated in the project (34 female and 1 male)

Details of the evaluation questionnaire

Was there enough announcements for the contest? 86.49% answered: Very Good.

Did the student choose a safe and convenience location for the contest? 89.7 % answered: Very Good.

Did the participant found the contest interesting? 91.35% answered: Very Good.

Did the message given by the project easy to understand? 86.49% answered: Very Good.

Did the participants have better understanding about diabetes? 89.10% answered: Very Good.

Did the participant gain enough knowledge to apply to everyday living? 86.49% answered: Very Good.

Did the students able to transfer the knowledge? 88.11% answered: Very Good.

Did the contest enhance the bonding within the community? 92.97% answered: Very Good.

Overall satisfaction 96.22% answered: Very Good.

Comments for the villagers:

- The sound was not clear.
- The speaker talked too fast.
- Impossible please use the local dialect.
- Impossible we want the students to come back.
- The one who talk about cabbage was very entertaining.
- Wanted to know if the students are happy?
- Wanted the students to stay longer.
- Very good activity, come back again.
- If more diabetes patient came they would gain lots of knowledge.

Project 2: Good health starts from mouth

Rational

Health is the basic need of all human beings. Good healthy habit should start at very young age.

Objective

1. To enhance the proper health knowledge and self health promotion for better health.
2. To stimulate and create new trend toward self health care.
3. To enable the student to see relationship between health and sufficient economy.
4. To enhance the community working skill among the health sciences students.

Target

School age children (9 years old and older).

Method

Prepare, write, and hand in the project

Find the school

Prepare the material

Implement the project

 Create oral health club in school

 Find a location in school and create poster board

 Recruit club member

 Use walk rally as a method to convey the health message

 Follow up the club's activity

Teaching how to brush
 Hand out toothbrush and toothpaste
 Demonstrate the Modified Bass Technique brushing
 Test the plaque bacteria (basic fushin) before and after the activity

Indexes for project success

- Outcome of the project
- Questionnaire about health culture and satisfaction
- The plaque stain

Benefits

For students and the university

- The students can compare the differences between theory and practices and be able to learn from mistakes.
- Help the student to think systematically and work as a team.
- Khon Kaen University is recognized

For the community

The student gain better understanding and convey the knowledge to their family member.

The people are aware of self health promotion.

Corroborations between government and private sector

Teacher , students, and the community members has a chance to exchange and be a part of the health promotion activities,

Analysis

Participants

Age	Number	Percentage
8	10	27.0
9	7	18.9
10	7	18.9
11	10	27.0
12	3	8.1
total	37	100.0

Pretest/posttest result

Test	Minimum	Maximum	Average	Standard deviation
Pretest	4	14	9.22	2.462
Posttest	3	15	10.84	2.444

70.3% of the students had an increased score. 29.7 scored lower in the posttest.

Plaque index

The plaque index was measure with Basic fushin stain on the side of each tooth.

Test	Minimum	Maximum	Average	Standard deviation
Before	38.5	100.0	80.74	13.30
After	0	68.75	16.07	16.43

After accessing the position and the method plaque index was remeasured

Test	Minimum	Maximum	Average	Standard deviation
Position	8	100	71.68	24.66
Method	8	100	70.72	24.68

Problem during the project implementation

1. Meeting among student from different faculty was difficult. We only have 3 days before the project to assign the jobs. The project planning and preparation was done by one group of students. Lots of students did not understand the working process.
2. There was not much time to properly calibrate the Plaque staining measurement technique.
3. The student did not have time to find the target group before going to the field. So it was difficult to prepare the correct amount of the material needed.
4. We hope that the participants of the project will be the core member of the oral health club. But they need support from the teachers in their school.
5. The different age group made it hard to maintain the children concentration during the time of the project. There was lots of message to be conveyed. Some of the message was complex. Entertaining activities were needed to maintain the children concentration. However, we have a problem with the students who are responsible for this part of the project. Some of them were not present due to other obligations.

Details of the evaluation questionnaire

Criteria for evaluation: Very good more than 85%, OK 60-85%, Need improvement less than 65%

:

100% of the participants realized the importance of oral hygiene. This showed that the students can reach out to the children and motivate them to see the importance of oral health.

92% of the participants understood of the information given. This show that the student can not convey the information or some of the information might be hard and too complex for children to understand.

78.95 %of the participants able to brush correctly after the project. This result means that the children cannot properly brush. We thought that it is because they were too young to understand and cannot memorize the technique.

100%of the participants applied to everyday life. Although the children were not fully understand but they were willing to try to use this new method of brushing.

76.32% of the participants felt that they are able to teach other. This is because the children themselves cannot understand the technique, so they were not confident to teach the others.

100%of the participants found the activity interesting. This means that the activities were appropriate to this age group.

84.21% of the participants thought that the timing was appropriate. This is due to the fact that the children had limitation of the ability to learn. We were had to teach the method in a one by one manner not as a group demonstration.

97.37% of the participants satisfied with the project. This means that the project was successful.

Appendix 2

Students' report of University of Health Sciences (UHS)

Lao Students' Report of Community Field Work

During a 21 day working at community, each team of students have to make a report of their works in the community and present to villagers and submit to teacher at UHS. The report consist of three parts: group's management Logbook, Individual management look book and community report of whole activities. Here is one of the report.

Cases of report : three community reports of students conducted in Ban Nong Buaosai village , Xekhong province. Nahuaophou village , Bolikhamxay province and Muang Muei village, Vientiane province.

INTRODUCTION: A community is a social group determined by geographic boundaries and or common values and interests. Its members know and interact with each other. It functions within a particular social structure and exhibits and creates norms, values, and social institutions.

The health status of the community is a product of the various interacting elements such as population, the physical and topographical characteristics, socio-economic and cultural factors, health and basic social services and the power structure within the community. The interrelationship of these elements will explain the health and illness patterns in the community.

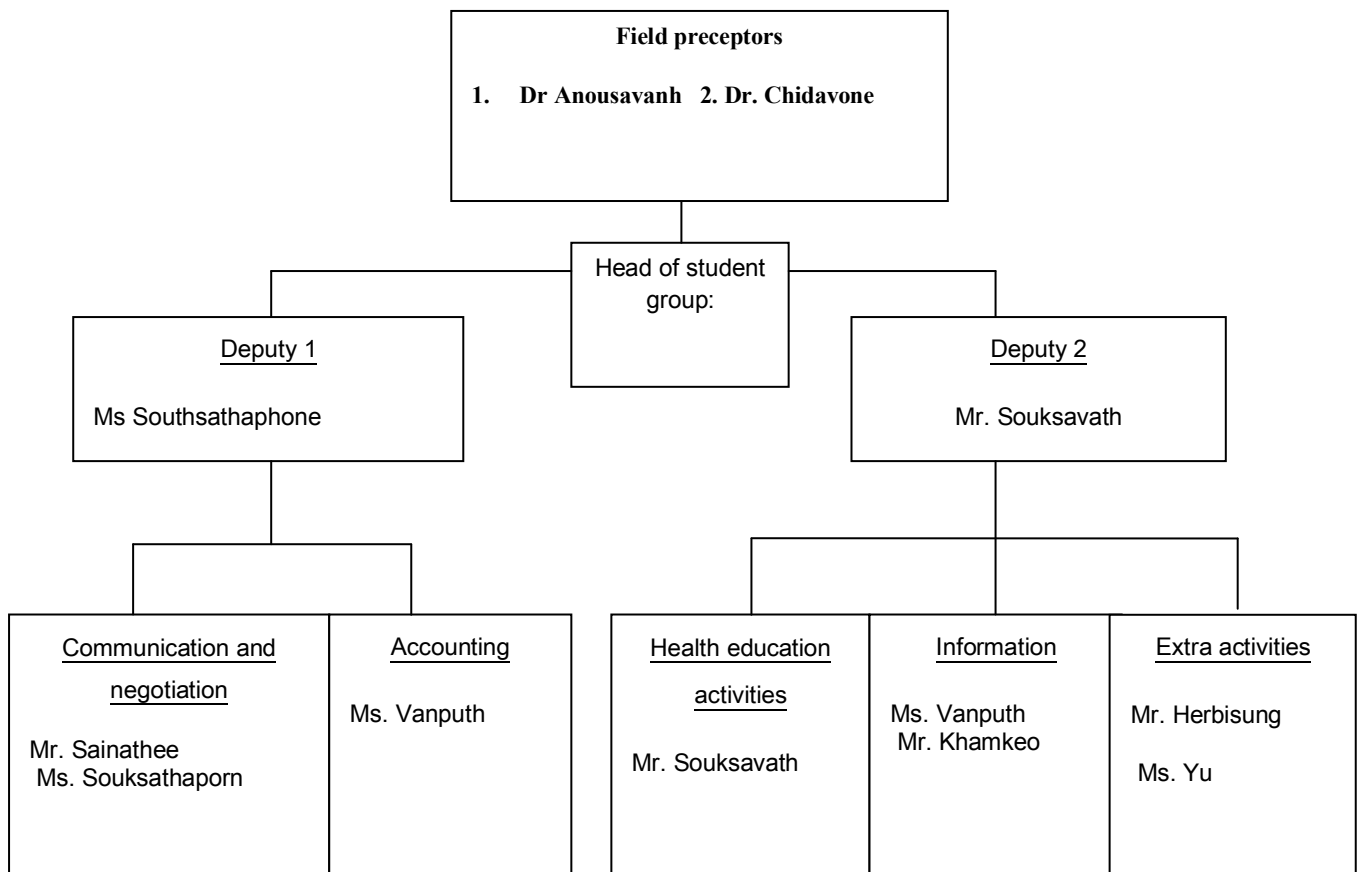
OBJECTIVE

To strengthen the health care system by enabling people's active participation and involvement for better health and self-reliance, and increasing opportunities and supporting conditions wherein people will manage their own health care, through partnership with and empowerment of the people.

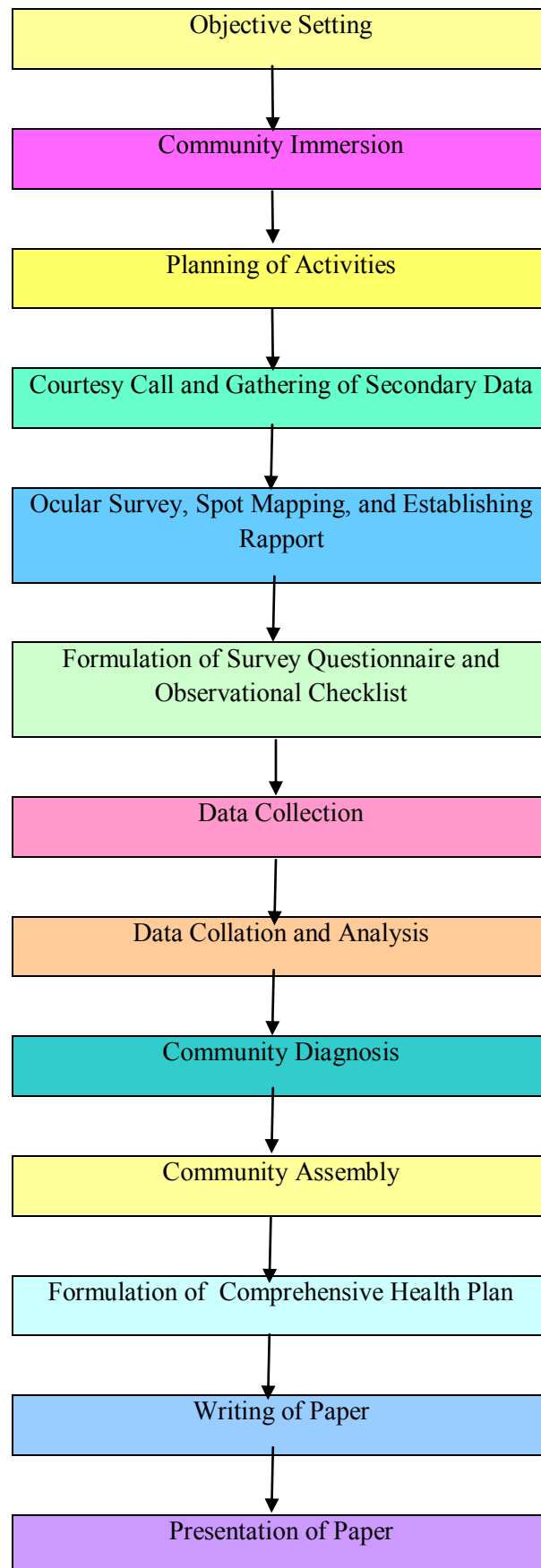
METHODOLOGY

The area of field was conducted in Nongbaosai village, Thateng district, Sekong province. Based on the actual house-to-house survey done by the group, a total of 246 households were recorded. The group was able to cover 41 households with 246 individuals. A total of 98.20% coverage done.

a. Organisational chart of students' teamwork



b. Flow of Activities



- c. **Immersion into Community:** Meet with community leaders and traditional health workers , Mingle with local people

The first two (2) days of community immersion were devoted to searching for a place to stay, buying of necessary things needed, and planning of activities for the 21days Community Health Management. Courtesy calls were then made together with head of district health office at the district health office, district Administrator, and head of village including Village Officials. The group was introduced and the objectives of stay were presented. Gathering of secondary data were also done as necessary for the community setting. Thereafter, a two (2) day ocular survey on all 36 households was conducted as well as courtesy calls on all village officials and establishing rapport with the people. Spot mapping was also done to determine the approximate number of households in the area and to plan out strategies for an efficient house-to-house survey.



- d. **Formulation of Instrument**

A survey questionnaire and observational checklist was utilized as means of data collection. This was patterned after the previous papers on community diagnoses conducted by students of the University of Health Sciences. Modifications were one as deemed necessary by the group with the help of field teachers. The instrument contained issues covering the demography, economic profile, environmental, social, and health indices of the community. Before the actual data gathering, the group discussed and analyzed each item of the instrument in order to standardize the approaches.



e. Data Collection

The collection of data was completed for 3 days. The study area was surveyed through house-to-house interview of an adult member of each household using the formulated instrument. The group composed of eight (8) members was subdivided into four (4) small groups, each of which has members that can communicate in different dialects to limit problems with communication and to ensure a comprehensive data collection, and for reasons with consideration of the member's safety. Each small group was assigned to cover a particular area together with the placement of house markers to ensure a complete coverage and to spell out the total number of households in every units. Documentation via pictures was also done to serve as evidence on the data presentation.



f. Data Collation and Analysis

The data gathered from the survey were collated, tabulated, and analyzed through frequency distribution, percentages, rates and ratio, and were presented in graphs and tables.



Formulation of Comprehensive Health Plan

The community assembly was held at the centre yard of Village. The group was glad to have the presence of village head, field preceptors of University and some residents of the community. There were a total of fifty-six (56) individuals who attended the assembly.

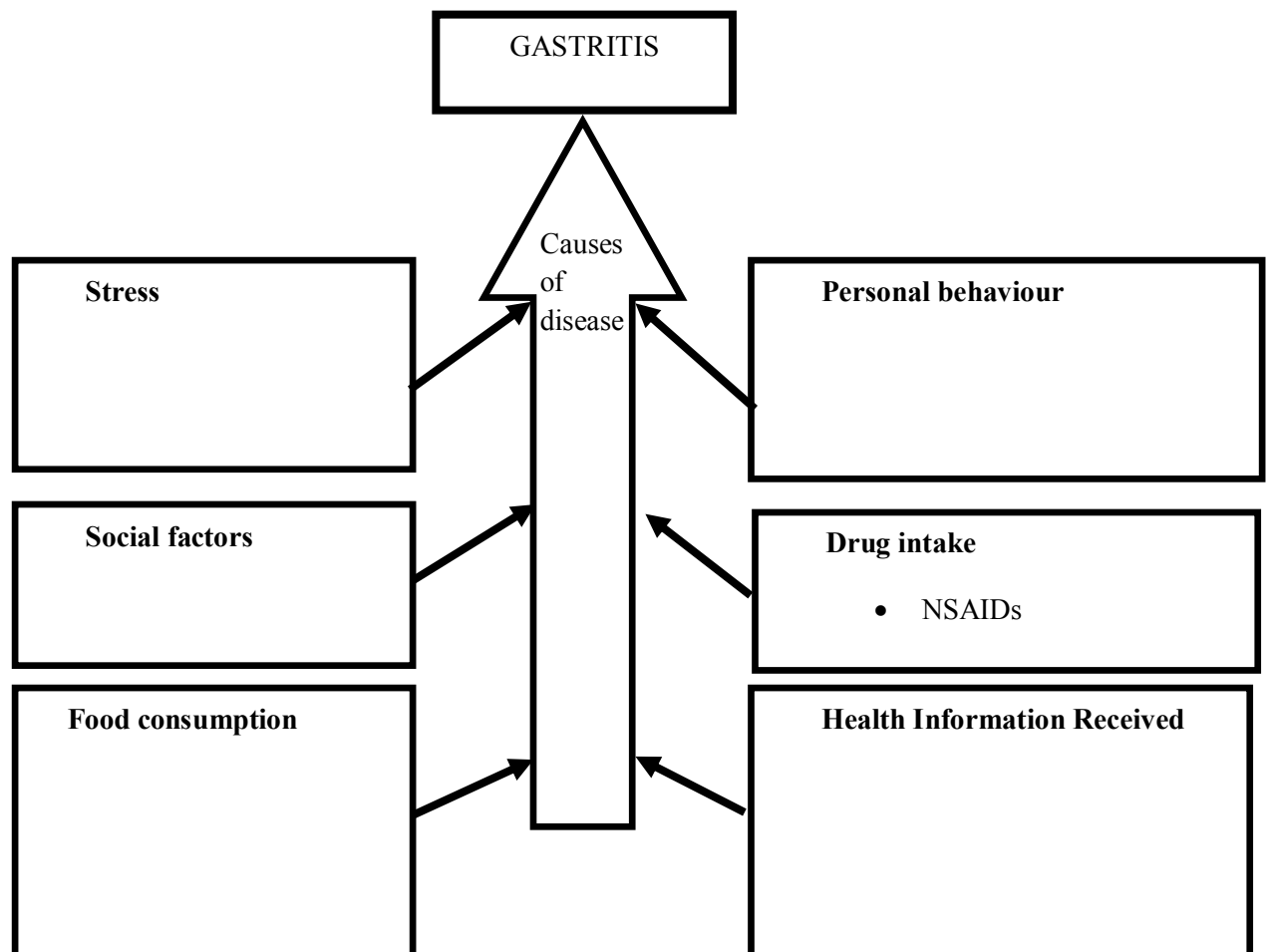
The community assembly conducted aimed to facilitate the people in identifying and prioritizing their felt needs, and come up with a comprehensive health plan. This was started by first explaining the objectives of the event and its importance to the community. Then followed by the presentation of the survey results along with some health education and explanation of the relevance of each data and its impact on the community's health status.

After the presentation of results, an open forum of discussion had started to come up with a list of identified felt needs in the area which they consider to be of importance. Different problems were hence identified, and this were analyzed and categorized into major groups in order to come up with the final list of identified felt needs. Together with the residents, objectives and strategies were made, manpower and time frames were identified to address the felt needs of the community.

Prioritization of the identified problems was done by the residents in two (2) respective events, at the community assembly and at the village leader's weekly meeting. The group also did a prioritization of the identified problems utilizing the Araceli Maglaya's guide to priority setting. This only serves as a comparison with a formal standard criteria. Then followed by the formulation of the comprehensive health plan which includes the identified problem, objectives, strategies, time frame, materials, persons involved, and evaluation indicator.



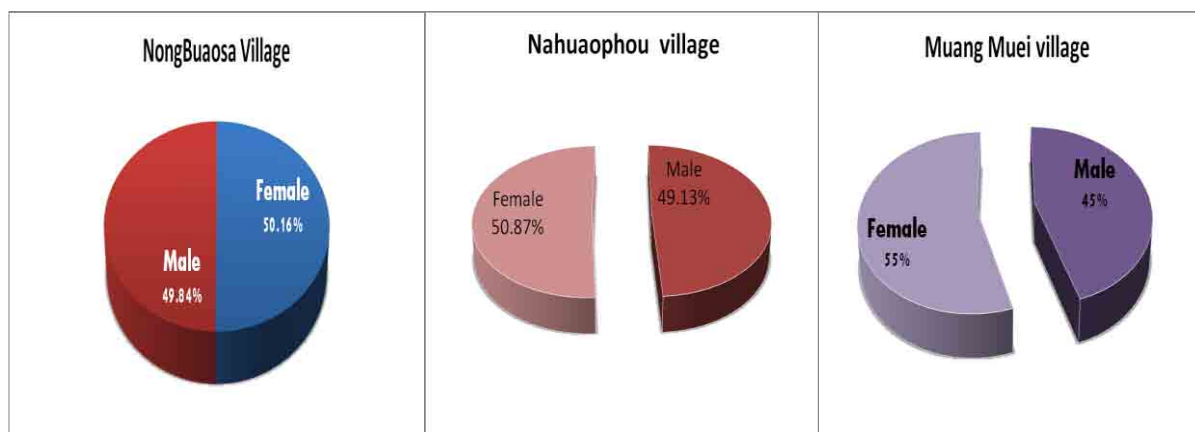
FISH BONE ANALYSIS



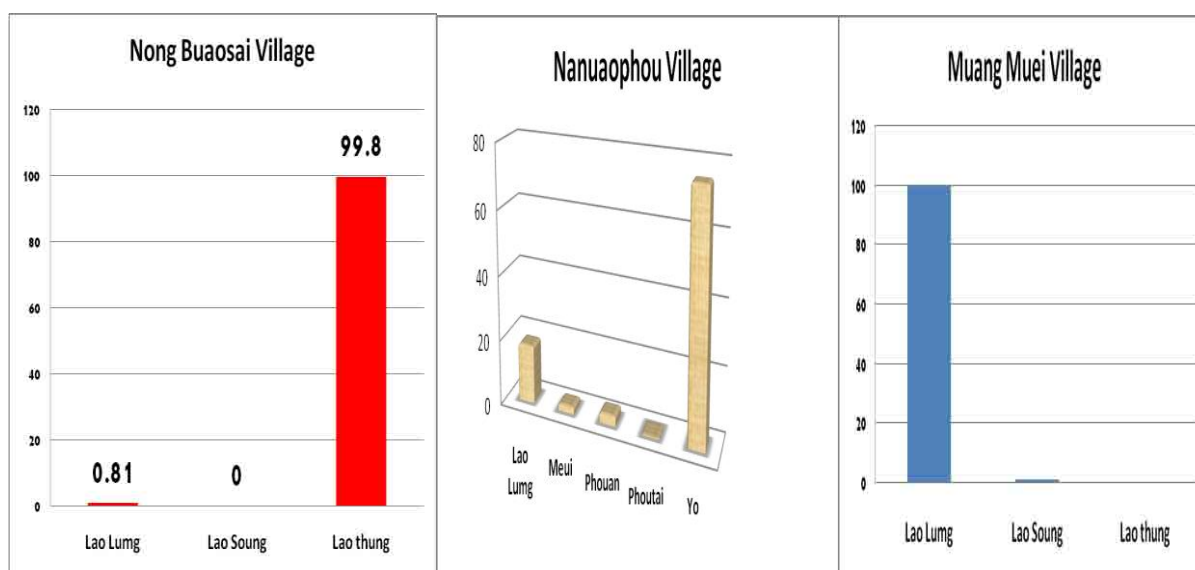
RESULTS OF COMMUNITY HEALTH SURVEY

Percentage distribution of socio-demographic characteristic

Sex Distribution



Ethnicity



Home Sanitary Condition

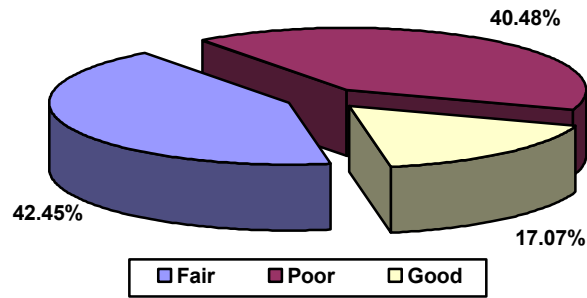
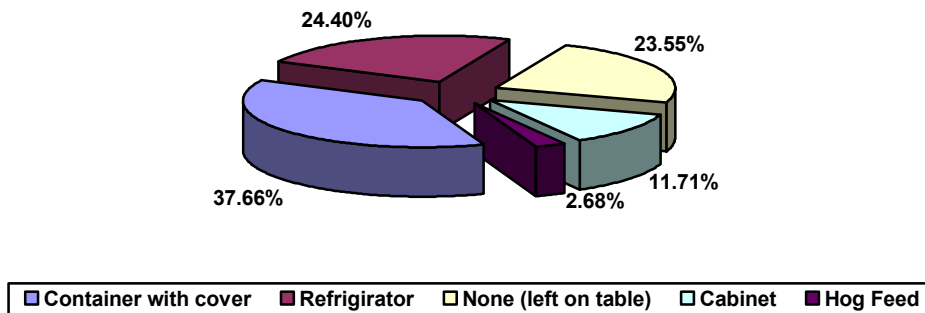
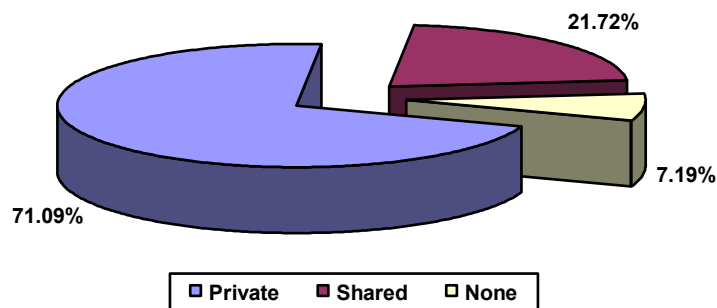


Figure shows that among the total households, only 17.10% have good home sanitary condition, while 42.45% have fair, and 40.45% has poor home sanitary condition. The sanitary condition of the house can contribute much on the health of the household members living in it. Uncleanliness facilitates the growth of certain microorganism, which in turn may invade the body, causing illnesses such as dermal problems, parasitism, diarrhea and other gastrointestinal diseases.

Methods of Food Storage and Preservation



Toilet Ownership



Presence of Garbage Container Inside the House

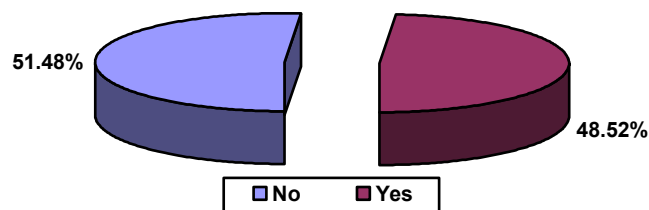


Figure shows that among the total households, only 48.52% have garbage container inside their houses while 51.48% do not have garbage container. Among those households with garbage container, majority 54.07% are covered. Garbage containers that are uncovered will attract flies which are known to be vectors of microorganism.

Primary Health Seeking Preference

Among the total households, 50.49% have mothers who make decisions with regards to health, 26.94% have both father and mother, and 21.02% have fathers. The rest 0.28% sons and 0.27% daughters. This indicates that majority of the households have mothers who makes decision with regards to health and this is true enough as mothers are considered the primary care provider of the family.

Majority of the households prefer self-medication either by use of over-the-counter drugs or herbals plants. Major reasons for these as verbalized by the households are seeking consult would waste them time and money since they already know what medicines to give and would disrupt their scheduled work and lessen their expected income.

Tooth Brushing Practices

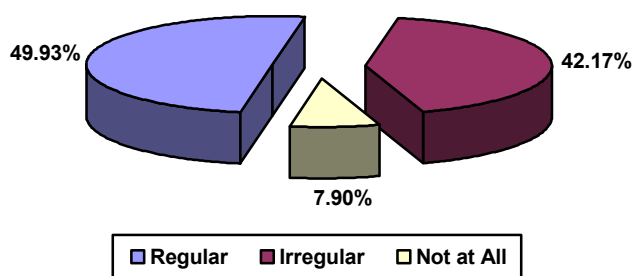
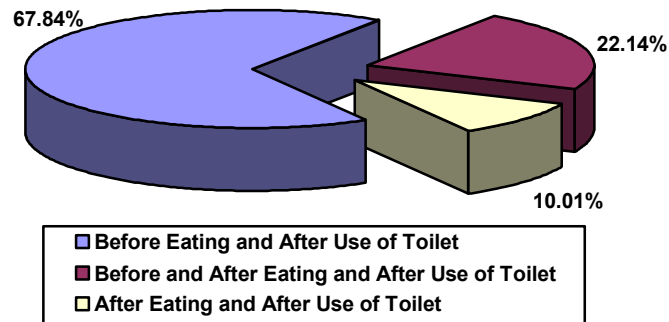
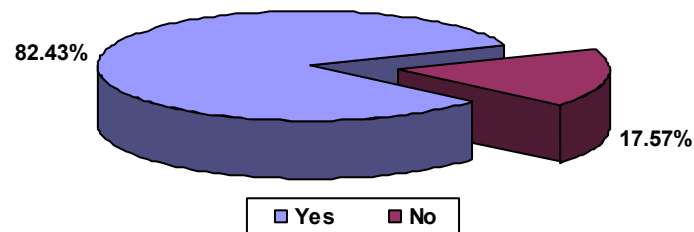


Figure shows that among the total households, 52.93% have all members practicing irregular tooth brushing, 39.17% practice regularly, and 7.90% do not practice such dental hygiene. Among those 653 households who practice tooth brushing, 90.20% use toothpaste and 9.80% use salt and water. In terms of dental check-ups, majority 77.01% of the households have never been to a dentist, 18.48% visits the dentist for tooth extraction or prophylaxis, and only 4.51% have regular every 3 months dental visits.

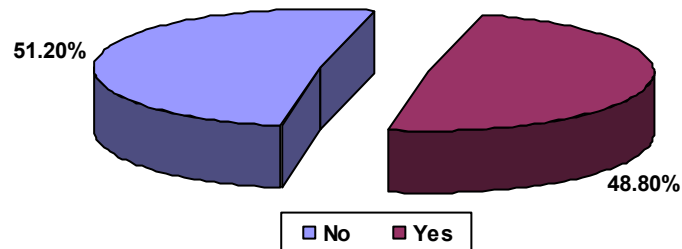
Hand Washing Practices



Herbal Plant Utilization



Superstitious Health Beliefs



Herbal Plant Utilization

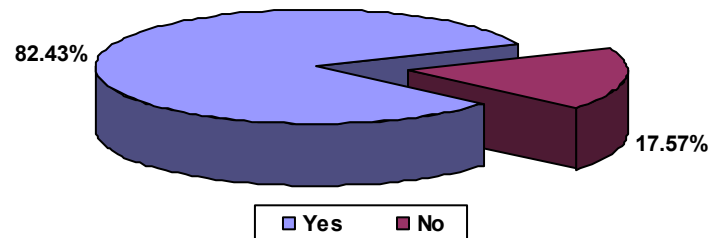


Figure shows that among the total households who are aware of herbal plants, majority 82.43% utilize it to treat common illnesses for accordingly, it is much cheaper as compared to over-the-counter drugs and it is readily available in the community, and only 7.57% does not utilize it due to the fear of its side effects and unaware of its uses and preparation.

COMMUNITY DIAGNOSIS

A healthy community means more than healthy individuals living in a particular community. The World Health Organization has defined health as not merely the absence of disease or infirmity but the complete state of physical, mental, political, and social well-being. While state of physical health of the people is very important, the state of social, economic, political, cultural, and environmental health of the whole community are equally important.

Based from the data obtained, Nongbuaosai, Nahuaophpu and Muang Muei villages are diagnosed as an unhealthy community.

A total of identified problems were included in the Comprehensive Health Plan of each group of students. These problems were prioritized by the residents of the community. The identified problems according to priority are; Absence of Health-Related Community Organization, Poor Environmental Sanitation, Increase Incidence of Acute Respiratory Infection, Increase Incidence of Diarrhea, Decreased Family Planning Acceptance, and Poor Nutritional Status etc.

COMMUNITY HEALTH PLAN

Problem: Poor Environmental Sanitation

General Objective: To improve the environmental sanitation of Nahuaophou Village, Bolikhamxay province by the end of year 2009.

Specific Objectives	Strategies	Time Frame	Materials and Money	Persons Involved	Evaluation Indicators
To assess and improve the knowledge, attitudes, and practice of the residents on proper garbage disposal and its effect on health, garbage segregation and profitable way of earning from garbage (recycling)	Inform proposed activity to the head of village for affirmation, support, and participation Conduct assembly of members of health-related community organization and village officials - state proposed	February, 2009	Village Hall or place for lectures on every village Pre and post examination sheet	Students Residents of the community Invited guest lecturers Officials and village	Post-exam results Lecture attendance at least 75.00% of the households in every purok Increase number of household practicing waste

	activity - planning and scheduling of activities per village Pre and post-exam Lecture on: - proper garbage disposal and its effect on health - garbage segregation and recycling		Lecture materials Snacks	Officials BHWs and members of health-related community organization	segregation from 70.10% to 80.00%. Increase number of households having garbage container from 48.52% to 60.00%
--	---	--	--	---	---

PROJECT IMPLEMENTATION OF COMMUNITY HEALTH PROBLEM SOLVING

1. Students provide people with environmental sanitation and its effect on health. Conduct community clean-up campaign with residents on their respective communities



2. Health Education Implementation:

The students conducted Information, Education and communication (IEC) campaign in villages with people attending. The contents of IEC included basic knowledge of diarrhea, malaria, tooth decay prevention, cause of tooth decay, demonstration of correct tooth brushing, MCH, essential drug use, combination between traditional and modern medicine, birth spacing.



3. Village health volunteers training



4. Health examination to communities



5. traditional medicine garden



6. Information board



In order to provide information education communication (IEC) to the community, IEC boards were constructed in target villages. Pamphlets, posters and other health information were stuck on boards which attracted women and children to look at the board.

7. Informal Curriculum Activities



Closing Ceremony



A "soo kuan" or sometimes called "Baci" ceremony is one of the most important part of Lao culture. It's a ceremony which may be held to mark any important occasion such as a wedding, birthday, illness, accidents, moving to a new house, the start or conclusion of a major journey (e.g. if someone is going overseas).

CONSTRAINTS

- Due to the ethnic group with different languages, it was difficult to communicate or conduct IEC. However, the students still had some convenience because local health staff at health centres, VHVs, and village organization assisted in communication.
- The majority of students are year five students who had more theory than practice in disease treatment. Therefore, the main focus of this field practice was directed to IEC and disease prevention. In reality of the community, disease treatment is highly needed. At the same time, the students had limited experiences about treatment and with the assistance of the teachers team they could overcome this problem.
- Field practice needs work as a team, so the students live at the same place. However, people live scatterly as a result time consuming for travel and they had less opportunity to work together.

LESSON LEARN

- Due to the differentiation of the project areas, different data collection techniques should be used such as the integrated of community participation assessment or opened end question to get opinion, the impression of the students receiving from the community. This will result in an efficient project evaluation.
- The establishment of traditional medicine garden has a risk of sustainability because VHVs who are responsible for the garden have low level of education and are not interested in taking care the garden. It is proposed in the future, the project should look for some one who has experiences with traditional medicine to take care this issue.
- VHVs training should focus on those who have ever trained in the past and provide refresh training for them.
- The District Health Office should organize a mobile health team to conduct health examination during the practice of the student in the community.

Appendix 3

Community-Based Research (CBR), 5th year medical student report
of Muhimbili University of Health and Allied Sciences

MUHIMBILI UNIVERSITY OF HEALTH AND ALLIED SCIENCES

CBME COURSE OVERVIEW

Muhimbili University of Health and Allied Sciences has five schools which are Medicine, Nursing, Dentistry, Pharmacy and School of Public Health and Social Sciences (SPHSS). Most of community based medical education is coordinated by SPHSS while community based training specific to each profession is offered by the respective schools.

Doctor of medicine degree is a five year programme which is divided in 10 semesters, CBME is taught from the first semester with courses which serve as foundation for community health training. These include development studies, medical sociology, psychology, biostatistics, research methods and epidemiology, which are taught in the first two semesters.

At the end of second semester students conduct community based research (CBR), this is conducted by the whole class which has about 200 students divided in small groups of 10-20 students, this is a nutrition field work, and students develop their research protocol in small groups and subsequently discuss them in the whole class in the presence of their facilitators. This nutrition field work is carried out in one month, the first week is for protocol development, the second two weeks are for data collection and the last one week is for data analysis and report writing. Usually students give feedback to the community leaders of the communities in which the field work was conducted and this is done soon after data collection as preliminary report. The final report is sent to the community after assessment.

During semesters 5 and 6 students also conduct another CBR which is carried out by the whole class. This is on communicable disease control. The students will select one prevalent communicable disease they want to do their CBR on. It is a four weeks community field work, whereby the first week is spent on protocol development, the second and third weeks are for data collection and the fourth week is for data analysis and report writing. Students will also give a preliminary report to the community and subsequently provide a final report after it has been assessed by the department.

During semesters 7 and 8 students have community field rotation which is 12 weeks rotation block dedicated to community health training. During this period students are divided into smaller groups of up to 20 students per group, and they visit rural dispensaries and health centres for one week each. Afterwards they spent two weeks in district hospitals where they learn the health care systems and their management. They also conduct CBR, in which they pick a topic of their interest, develop protocol, collect data, analyze and subsequently write their report and provide feedback to the communities.

At the end of semester 7 and 8 students conduct CBR individually. They choose their subject, and assigned supervisors, develop their protocols, collect data, analyze them and subsequently write reports and give feedback to the communities involved.

This course overview is for CBME for MD students. Dental students share some of CBME courses especially in the first four semesters. The attached report is a typical activity they undertake at the end of their 8th semester in medical training.

**MUHIMBILI UNIVERSITY OF HEALTH AND ALLIED
SCIENCES**



**SCHOOL OF PUBLIC HEALTH AND SOCIAL
SCIENCES**

**DEPARTMENT OF EPIDEMIOLOGY AND
BIOSTATISTICS**

RESEARCH REPORT

**TITLE: ASSESSMENT OF KNOWLEDGE, PERCEPTION AND
ATTITUDE TOWARDS HAZARDS DUE TO EXPOSURE TO
PESTICIDES AMONG WORKERS OF TENDERU FLOWERS
FARM, ARUMERU DISTRICT IN JULY TO AUGUST 2008.**

**AUTHOR: MATEMU SARAH
Reg No: 47516 T/2004**

ACKNOWLEDGEMENTS

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I further convey my appreciation to Tengeru flowers farm, Mr Mark Ngallo, the Executive Director for allowing me to conduct this study, the farm manager Mr Solomon for his assistance during data collection and all the workers for their support and co-operation.

Lastly to all the others who contributed in making this study a success.

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ABBREVIATIONS

- **ILO**-International Labor Organization
- **IPM**-Integrated Pest Management
- **PPP**-Public Private Partnership
- **TAHA**-Tanzania Horticulture Association
- **TPRI**-Tropical Pesticide Research Institute
- **WHO**-World Health Organization

ABSTRACT

Flower farms are new in Tanzania, and there is an intensive use of pesticides at the farms, despite the fact that control mechanisms are not yet in place. Given the frequency and variety of pesticides in flower farming in Tanzania, the size of risk of possible pesticide-induced illnesses is great. The concern about pesticides arises because they pose significant occupational health and environmental risks throughout the world

This study aimed to determine the knowledge, perception and attitude towards hazards due to exposure to pesticides among workers of Tengeru flowers farm in Arusha, Tanzania.

It was a cross-sectional study involving one hundred and twenty five(125) randomly selected workers between the ages 19-34years old. Majority were males (52%). Workers participated by answering a questionnaire on knowledge on pesticides and hazards due to exposure, attitude and perception on use of protective gear, symptoms and pesticide information acquisition.

Knowledge on pesticides was reported by 76% of the workers but only 10.4% reported being knowledgeable on the contents by reading labels on the container. Majority (94.4%) of workers know that exposure to pesticides is hazardous to health. Among the workers, 43.2% reported wearing protective gear all the time while at work and 48.8% reported symptoms of pesticide exposure.

This study showed that majority of the workers at Tengeru flowers farm in Arusha, Tanzania have knowledge on pesticides and good perception and attitude towards preventive measures towards exposure to pesticides. This study also revealed lack of knowledge on symptoms related to pesticide exposure.

According to the findings of the study there is still need to advocate for information dissemination, workers education on symptoms of pesticide exposure, increase workers training and adherence on the use of protective gear and pesticide reduction programs in flower farms by using other means of pest control such intergrated pest management.



Pic1. One of the greenhouse at Tengeru flowers farm.

INTRODUCTION

Pesticides are defined by Tropical Pesticide Research Institute Act no. 18 of 1979(**TPRI 1979**); *An authority on pesticide regulation in Tanzania* as; „Any matter of any description including acaricides, herbicides, insecticides, fungicides, molluscides, nematocides, hormonal sprays and defoliants used or intended to be used, either alone or together with other material substances for; The control of weeds, pests and diseases in plants or control of external vectors of veterinary or medical disease and external parasites of man or domestic animals or the protection of any food intended for human or animal consumption.

The concern about pesticides arises because they pose significant occupational health and environmental risks throughout the world (**Forget 1991, WHO1990**). Flower farms are new in Tanzania, and there is an intensive use of pesticides at the farms, despite the fact that control mechanisms are not yet in place.

Workers in these settings may be exposed to these pesticides while transplanting, pruning, cutting and packing flowers without protective garb may absorb pesticides through their skin. Dusting, spraying, and other applications of chemicals in enclosed spaces such as greenhouses may allow workers to inhale pesticides. Spraying workers are usually most highly exposed group because of inadequate clothing, drift of spray droplets, leaks and other defects in spraying equipment.

Pesticide hazards are frequent and severe in developing countries where pesticide use is wide spread. Pesticides can cause among other long-term effects cancer, birth defects, reproductive illnesses and neurological disease in humans. Given the frequency and variety of pesticides in flower farming in Tanzania, the size of risk of possible pesticide-induced illnesses is great. Workers at these farms are not aware of actual health risks due to pesticides in their surroundings and the ones handling chemicals do not know what chemicals they are using or their inherent dangers (**Riwa and Monyo 1999**).

Tengeru flowers - grower and exporter of high quality roses is a privately owned company. It is located at Usa River in Arumeru district in Arusha Region in Tanzania, strategically near Arusha town, with easy access to Kilimanjaro international airport and neighbouring towns (Arusha, Moshi) and Nairobi by Road. Tengeru flowers currently ships 500,000 stems of roses per month to the European Market. Tengeru flowers is a member of TAHA, whose policy recognizes that investment in safe work and employee health makes good economic sense and ensures long term environmental protection and reduces losses due to accidents and injury at work. However, realization of safe work policy requires workers who are knowledgeable, correct perceptive and with good attitude towards health hazards.

This study aims to assess the knowledge, perception and attitude towards health hazards due to pesticide exposure among workers of Tengeru flowers farm in order to ascertain if there are any areas that need improvement in relation to work and employee health.

LITERATURE REVIEW

The cut flower industry has exploded recently in Tanzania, where pesticide poisoning was already common. In the 1980s, according to an International Labour Organization (ILO 2002) report, 368,000 Tanzanian people were poisoned annually by pesticides. Tanzanian floriculture production soared from 98 million stems in 1994 to 322 million in 1998. The report on the cut flower industry cited a Tanzanian government study that listed the following deficiencies in pesticide handling: a shortage or lack of material safety data sheets and instruction manuals, worker ignorance of the identity and hazards of chemicals, improper storage of chemicals, lack of emergency treatment for accidental poisonings, no training for operators to recognize early signs of accidental poisoning, improper use and maintenance of personal protective equipment (when provided), and inadequate disposal of waste.

A study done in among 500 small scale farmers in Kilimanjaro and Arusha regions, Northern Tanzania indicated that coffee growing areas are exposed to hazards due to lack of knowledge and agricultural extension services. Among the problems included lack of protective gear reported by 13% and lack of appropriate knowledge on pesticides reported by 11% of the farmers (Ngowi et al. 2001). The study also reported 2.4% of the farmers indicated the necessity of reading labels on pesticide containers.

Riwa and Monyo in 1999 surveyed eight flower farms operating in Northern Tanzania. Participants, farm one 11.4%, farm two 10.0%, farm three 10.2%, farm four 11.2%, farm five 7.7%, farm six 4.7%, farm seven 4.4% and farm eight 11.4%. They reported that great variety of agrochemicals were in use in these farms. They further observed that material safety data sheets were not available and instruction manuals on proper chemical handling were scarce. Most workers who handled the chemicals during storage, mixing and spraying reported they did not know what chemicals they were using or there inherent dangers. The investigators also reported that chemicals were improperly stored. Emergency treatment to deal with accidental poisoning was reported to be lacking, and there were no instructions on the steps to be taken in the case of accidental spillage or body contact with chemicals. The survey also revealed that there was no training policy for workers or their supervisors on how to recognize early signs and symptoms of pesticide poisoning.

A study done by Claudette Mo between 1994 and 2000 described the occupational health situation in the Costa Rican floriculture industry as very poor due to over 50% of respondents who worked in fern/flower farms reported at least one of the symptoms of pesticide exposure--headache, dizziness, nausea, diarrhoea, skin eruptions or fainting. Also she reported, workers did not recognize these symptoms as pesticide exposure and the doctors who treated them "did not disclose the information due to lack of knowledge themselves or because they worked for the fern company."

Sylvia Joly in February 2002 reported on some of the problems in Ecuador's floriculture industry associated with pesticide use. According to Joly, many of the pesticides used in the industry have been banned from use in the United States or Canada, because of the hazard they present to humans. Regarding work practices, she reported workers being at high risk of exposure to pesticide by the testimony given by workers that there was never a delay for re-entry into the greenhouse after fumigation. Workers were seen going in and out. At a supposedly good greenhouse, there was a sign saying 'two hours delay' but some workers reported that in other greenhouses spraying was done while workers were inside.

STATEMENT OF THE PROBLEM

From a survey conducted at eight flower farms in Tanzania in 1999 (**Riwa and Monyo 1999**) reported that; A great variety of agrochemicals are used on the farms and most of the chemicals were not accompanied by material safety data sheets. Instruction manuals on proper chemical handling were not available. Also most workers who handled the chemicals during storage, mixing, and spraying did not know what chemicals they were dealing with; nor were they aware of dangers associated with the use of the chemicals. Some chemicals were improperly stored and emergency treatment procedures for accidental poisoning were in most cases not in place. There were no instructions as to what were the emergency steps to be taken in the case of accidental spillage onto workers (for example, emergency showers). There was no training programme to make operators capable of recognizing early signs and symptoms of pesticide poisoning arising from accidental pesticide exposure.

Acute health effects of a number of pesticides like organophosphates are well characterized (**Ohayo-Mitoko et al.1997**) but the long term health effects of routine, small exposure are uncertain. Based on hospital registries, World Health Organization estimated that three million cases of acute pesticide poisoning (two million suicide, one million accidental poisoning) resulting in 220,000 deaths, occur worldwide each year (**WHO1990**). The burden of pesticide related illness and injury is difficult to determine since many cases of pesticide poisoning remain undiagnosed and/or unreported (**Ballard and Calvert 2001**). Diagnostic problems are particularly prominent in developing countries (**Keyfer et al.1996**) due to insufficient medical training and a high level of background ill health.

There is neither a study nor survey that has been done to ascertain the source of information for workers in flower farms in relation to pesticides or the evaluation on what the common source of information is so as to use such a channel as forum for further education on hazards due to exposure to pesticides.

So there is a need for workers at high risk of pesticide exposure to have the awareness on hazards caused by pesticides and the importance on acquiring knowledge in relation to pesticides. Also to ascertain what the common source of information is so it can be used adequately.

RATIONALE

Flower farms are on the increase in Tanzania, currently there are about twelve. Pesticides are the only poisonous substances used extensively at the farms, but exposed workers can be adversely affected. Little has been done to assess pesticide hazards at flower farms in Tanzania but they are course of concern to workers and residents in areas surrounding the farms. This can be attributed to the fact that induced illnesses, whether accidental or occupational is not likely to recognize or investigate because of the secrecy and protective atmosphere prevailing at flower farms in Tanzania (**Ngowi 2003**).

Given the frequency and variety of pesticides in flower farming in Tanzania, the size of possible pesticide-induced illness is great but there are no strict rules governing the occupational health or medical monitoring on farm workers (**Ngowi 2003**).

This study pictures the degree of protection offered to workers in this flower industry in Tanzania. The results will be submitted to the school of public health and social sciences so as they can be used for planning of strategies to educate workers in several industries in Tanzania on safety from occupational health. The result also can be used by the to advice the Ministry of Health and Social Welfare and other health stake holders in the country on the extent of the problem, the proper interventions to be done and encourage more research in this particular field.

This study was also a part of my learning process as a medical student. It was to build up my skills in proposal writing, data collection and analysis. It was also keep me, as future doctor alerted on the extent and impacts of occupational health hazards and therefore be careful in early detection of symptoms of occupational health hazards and therefore make proper diagnosis and treatment.

It was also give a picture on the effectiveness of the current interventions for prevention of occupational health hazards and hence stimulate further studies on the adherence and effectiveness of preventive measures currently in place.

OBJECTIVE

Broad Objective;

To assess the knowledge, perception and attitude towards health hazards due to exposure to pesticides among workers of Tengeru flowers farm in Arumeru district.

Specific objectives;

1. To determine the proportion of workers knowledgeable on pesticides, hazards due to exposure and ability to translate material data sheet or the chemical labels.
2. To determine the proportion of workers knowledgeable on preventive measures against health hazards due to exposure to pesticides.
3. To assess worker's perception and attitude towards preventive measures against health hazards due to exposure to pesticides.
4. To determine the proportion of workers reported to have symptoms related to pesticide exposure.
5. To assess worker's source of information regarding health hazards due to exposure to pesticides.

METHODOLOGY

Study design; A descriptive cross-sectional study was conducted.

Study area; The study was conducted at Tengeru Flowers farm in Imbasini village at Usa ward in Arumeru district of Arusha region, Tanzania. The five thousand square meters farm with thirty two greenhouses each having ninety three flower beds was started in 2001. Among the four hundred workers; two hundred and eighty six were at high risk of pesticide exposure. Spraying was done six days per week and Tropical pesticide institute inspected the farm once per week to ensure adherence to pesticides safety measures.

Study population; The study population was workers (men and women) at high risk of pesticide exposure who were willing to participate voluntarily. Most were men (52%) aged between 19 and 34 years old.

Sample size; The sample size was calculated from the following formula;

$$N = \frac{Z^2 P (100 - P)}{E^2}$$

Where;

N=sample size

Z=standard normal deviation set at 1.96 (corresponding to confidence level of 95%)

P=proportion of target population which is at high risk of exposure to pesticide which is an average of 8.9% from a study done in eight flower farms in Northern Tanzania august 1999 (**Riwa and Monyo 1999**).

E=maximum error, assumed to be 5%

Therefore;

$$N = \frac{1.96^2 \times 8.9(100-8.9)}{5^2}$$

$$N = \frac{3.84 \times 8.9 \times 91.1}{25}$$

$$N = 124.589$$

$$N \approx 125$$

Sampling procedure; Random sampling method was done amongst workers doing various activities such as spraying, fertigation (irrigation), grading, packing, growers (plant management, pruning, harvesting and general cleaning), supervisors and those working in the store at the farm in order to obtain representative sample.

Data collection; A structured questionnaire was used to obtain the information. The English questionnaire was translated to Kiswahili, which is the national language to facilitate adequate communication of the questions and responses between interviewers and the interviewees. Also background information was collected on pesticide use and exposure. The information collected using a checklist included: general data on the farm, such as location, sources of pesticides, names of pesticides used and their active ingredient, staff particulars including health surveillance and complaints, work activities, safety measures and training programmes.

Data analysis and presentation; Questionnaires were coded by the author at the end of each data collection day. Data was entered into a computer and analyzed using EPI Info software version 6.0. Data presented in the form of tables of results.

Data handling; Follow up of the research activities was carried out on a daily basis by the principal investigator.

Study limitation;

- Recall bias on reporting of symptoms of occupational health hazards. So the form of questioning was targeted on the very recent symptoms so as to make it easy to remember.

Research clearance and Ethics

Permission to conduct the study was obtained from Tengeru flowers farm Executive Director.

Eligible subjects were informed about the purpose of the study and a verbal informed consent obtained.

Each participant was assured that all the information given is confidential and code numbers were used instead of respondent's name.

RESULTS

The farm being a member of the Fair Trade Organization which upholds workers' right to safe work environment, in the need to improve working conditions the farm works on trying to reduce the amount of pesticides used by replacing with biological pest control. The most common active ingredients of the pesticides used included insecticides and fungicides. Most of the farm's pesticides supply is from Nairobi Kenya and the use of these pesticides is consistently monitored by Tropical Pesticide Research Institute (TPRI) through weekly inspections. Material safety data sheets and instructions are available mostly to the workers doing spraying and to supervisors of specific departments; Chemicals are stored in closed container in a storeroom and disposal of empty chemical containers with other farm waste is by burning. Activities performed which are sources of exposure include: spraying which is done six days per week using different pesticides for different pests, irrigation, pruning, harvesting, grading, packing, general cleaning and storage. There was no report of any recent emergency poisoning. Also reported was availability of charcoal as first aid for accidental poisoning. All supervisors are trained to be able to recognize early signs of accidental poisoning. The farm lacks sufficient medical resources such as a dispensary for management of poisoning incidents which means sending a patient to a near by hospital if an incident occurs. Also reported was the farm's implementation of monthly staff training programmes on pesticides use and protective measures.

Knowledge, attitude and perception of workers were assessed and results are as shown in tables below:

Table1. Demographic characteristics of study population

Age (years)	Frequency - n (N=125)	Percentage (%)
19-24	67	53.6
25-29	34	27.2
30-34	24	19.2
Gender		
Male	65	52
Females	60	48
Education		
Primary	104	83.2
Secondary	20	16.0
University	1	0.8
Activity		
Growers	45	36
Spraymen	25	20
Fertigators	15	12
Graders	25	20
Packers	9	7.2
Greenhouse supervisors	5	4
Storekeeper	1	0.8

Majority of the workers are between the ages of 19-24 years old
 More than half (52%) of workers whom participated in the study were males.
 Only 0.8% reported having university education.
 Majority of the workers included in this study were growers (36%)

Table2. Frequency distribution table showing proportion of workers with knowledge on pesticides

Response	Frequency	Percentage (%)
Yes	95	76
No	30	24
Total	125	100

Lack of knowledge on pesticides was reported by 24% of the workers.

Table3. Frequency distribution table showing proportion of workers with knowledge on pesticide contents

Response	Frequency	Percentage (%)
Yes	13	10.4
No	112	89.6
Total	125	100

Only 10.4% of the workers reported to have knowledge of pesticide contents and all reported it was from reading the labels.

Table4. Frequency distribution table showing proportion of workers with knowledge on pesticide application method

Response	Frequency	Percentage (%)
Spraying on flowers	122	97.6
Do not know	3	2.4
Total	125	100

Few (2.4%) of the workers were not knowledgeable on pesticide application method.

Table5. Frequency distribution table showing proportion of workers with knowledge on the threat to health posed by exposure to pesticides

Response	Frequency	Percentage (%)
Yes	118	94.4
No	7	5.6
Total	125	100

Lack of knowledge on the threat to health posed by exposure to pesticides was reported by 5.6% of the workers.

Table6. Frequency distribution table showing where workers go during spraying

Response	Frequency	Percentage (%)
Stay in the greenhouse	25	20.0
Go outside	100	80.0
Total	125	100

Most of the workers (80%) reported going outside while spraying was taking place in any particular greenhouse.

Table7. Frequency distribution table showing proportion of workers with knowledge on importance of staying out of the greenhouse during spraying

Response	Frequency	Percentage (%)
Yes	111	88.8
No	14	11.2
Total	125	100

Knowledge on the importance of staying out of the greenhouse during spraying was reported by 88.8% of the workers.

Table8. Frequency distribution table showing proportion of workers using particular protective gear

Protective gear	Frequency	Percentage (%)
Gloves	92	73.6
Masks	43	34.4
Boots	112	89.6
Apron/coats	60	48

Majority of the workers reported wearing boots (89.6%) and gloves (73.6%). All gear is provided by the employer. (n=125)

Table9. Frequency distribution table showing when workers wear protective gear

Response	Frequency	Percentage (%)
All the time while at work	54	43.2
During spraying	25	20
While in the greenhouse	45	36
Other	1	0.8
Total	125	100

Most of the workers (43.2%) reported wearing protective gear all the time while at work. All of the workers (100%, n=125) reported that it is important to wear protective gear.

Table10. Frequency distribution table showing workers' attitude towards the need of education on pesticides, hazards due to exposure and preventive measures

Response	Frequency	Percentage (%)
Yes	124	99.2
Do not know	1	0.8
Total	125	100

Majority of the workers (99.2%) reported the need of education on pesticides, hazards due to exposure and preventive measures.



Pic2. Worker cutting flowers wearing protective gear

Pic3. Packers wearing protective gear.

Table11.a) Frequency distribution table showing proportion of workers reported having symptoms related to pesticide exposure

Symptoms	Frequency	Percentage (%)
Coughing	15	12
Pruritis	5	4
Headache	18	14.4
Fatigue	2	1.6
Dizziness	13	10.4
Abdominal pain	3	2.4
flu & backache	5	4
None	64	51.2
Total	125	100

Majority of the workers (51.2%) reported no symptoms while 48.8% reported symptoms.

Table11.b) Frequency distribution table showing proportion of workers reported having the common three symptoms and workers with none of the symptoms.

Job / symptom	Graders n=25	Growers n=45	Sprayers n=25	Fertigators n=15	Packers n=9	G'sh spvs n=5	Store n=1
Cough	3	7	3	-	2	-	-
Headache	2	6	4	3	2	1	-
Dizziness	2	8	3	-	-	-	-
No symptoms	14	15	13	12	5	4	1

Headache was the most common symptom reported by 14.4% of the workers followed by coughing reported by 12% then dizziness reported by 10.4%. Workers did not recognize these symptoms as pesticide exposure.

Table12. Frequency distribution table showing workers' source of information regarding health hazards due to exposure to pesticides

Response	Frequency	Percentage (%)
From the media	57	45.6
Work related seminar	51	40.8
Fellow workers	44	35.2
No information	7	5.6

The media was the major source of information regarding health hazards due to exposure to pesticides to most of the workers (45.6%, n=125)

DISCUSSION

Pesticides use as means of pest control in flower farms in Tanzania is a cause for concern with regard to occupational health because the rise of flower industry contributes to the country's employment status. The need for investment in safe work and employee health makes good economic sense and ensures long term environmental protection and reduces losses due to accidents and injury at work. However, realization of safe work policy requires the employer's commitment in ensuring safe and good working environment and workers who are knowledgeable, perceptive and with good attitude towards occupational health hazards.

In ensuring safe and good working environment the farm reported availability of material safety data sheets and instruction manuals on pesticide use, trained workers in recognizing early signs of accidental poisoning with presence of charcoal for first aid, storage of chemicals in closed containers in a storeroom, burning of empty chemical containers and farm waste and the monitoring of proper handling and use of pesticides done by TPRI. It is different from the ILO 2002 report on the cut flower industry that cited a Tanzanian government study that listed the following deficiencies in pesticide handling: a shortage or lack of material safety data sheets and instruction manuals, improper storage of chemicals, lack of emergency treatment for accidental poisonings, no training for operators to recognize early signs of accidental poisoning and inadequate disposal of waste. This shows improvement on pesticide handling and improvement in working conditions for flower farm workers.

As regards to knowledge of workers on pesticides, hazards due to exposure and ability to translate material data sheet or the chemical labels, lack of knowledge on pesticides was reported by 24% which is higher than that of 11% reported in a study done among small scale coffee farmers by Ngowi et al. 2001, and in this study only 10.4% of the workers reported to have knowledge of pesticide contents and all reported it was from reading the labels which is higher showing improvement compared to the same study among small scale coffee farmers by Ngowi et al. 2001 in which only 2.4% of the farmers indicated the necessity of reading labels on pesticide containers. But it is still low therefore there is still serious need of appropriate knowledge dispensing to workers on pesticides.

In another study Riwa and Monyo in 1999 surveyed eight flower farms operating in Northern Tanzania. From the average of 8.9% of the participants, most workers who handled the chemicals during storage, mixing and spraying reported they did not know what chemicals they were using or there inherent dangers which is higher compared to this study in which only 5.6% of the workers did not know that exposure to pesticide poses a threat to health. This could imply the improvement in awareness of pesticides and hazards due to exposure. Also the improvement of technology and increase in research with respect to pesticides with time may have contributed to increase in awareness.

In this study it was also found that workers were knowledgeable on preventive measures against health hazards due to exposure to pesticides. Most of the workers (80%) reported going outside while spraying was taking place in any particular greenhouse. 88.8% of the workers reported being knowledgeable on the importance of staying out of the greenhouse during spraying. While Sylvia Joly reported in February 2002 on some of the problems in Ecuador's floriculture industry. According to Joly, Regarding work practices, she said, "We had a lot of testimony from workers saying there is never a delay for re-entry [into the greenhouse] after fumigation. Workers were seen going in and out. At a supposedly good greenhouse, there was a sign saying 'two hours delay' but some workers reported that in other greenhouses spraying was done while workers were inside. The difference can be explained by the farm's participation in ensuring that workers adhere to the rules through supervisors who monitor the day to day activities and also frequent reminders through seminars for workers on the effects of exposure to pesticides.

Further more this study revealed good perception and attitude of workers towards preventive measure against health hazards due to exposure to pesticides. Majority of workers reported wearing protective gear such as boots (89.6%) and gloves (73.6%). 43.2% of the workers reported wearing protective gear all the time while at work. Majority of the workers (99.2%) reported the need of education on pesticides, hazards due to exposure and preventive measures. While a study by Ngowi et al. 2001 among small scale coffee farmers in Kilimanjaro reported lack of protective gear by 13% as one of the problems of prevention against pesticide exposure. This can be explained by the difference in study setting between a flower farm which provides the gear for the employees and individual small scale coffee farmers that provide the gear for themselves.

A study done by Claudette Mo between 1994 and 2000 described the occupational health situation in the Costa Rican floriculture industry as very poor due to over 50% of respondents who worked in fern/flower farms reported at least one of the symptoms of pesticide exposure--headache, dizziness, nausea, diarrhoea, skin eruptions or fainting. Also she reported workers did not recognize these symptoms as pesticide exposure which is similar to this study in which 48.8% reported symptoms of pesticide exposure, headache being the most common symptom reported by 14.4% of the workers followed by coughing reported by 12% then dizziness reported by 10.4% where workers also did not recognize these as symptoms related to pesticide exposure.

With regard to source of information regarding health hazards due to exposure to pesticides, the media was the major source of information reported by 45.6% of the workers. This implies that more talk on pesticides should be encouraged through the media by airing programmes on awareness of pesticides and hazards due to exposure.

CONCLUSION

This study confirmed that majority of the workers at Tengeru flowers farm in Arusha, Tanzania have knowledge on pesticides. Also most of them have good perception and attitude towards preventive measures towards exposure to pesticides because majority of the workers reported on being knowledgeable on the importance of staying out of the greenhouse during spraying and reported wearing protective gear all the time while at work. It also revealed that workers that reported symptoms related to pesticide exposure had no knowledge that the symptoms are related to pesticide exposure. There is therefore an urgent need for education on symptoms of pesticide exposure and regular medical examination for workers because some may be experiencing slow poisoning and not reporting. Also there is a need of introducing other means of pest control so as to minimize the use of pesticides in order to improve working conditions.



Pic4. Flowers in the greenhouse

RECOMMENDATIONS

This study has proven that the emerging floriculture industry is a potential sub-sector for improving socio-economic conditions of communities in developing countries like Tanzania. The following are the recommendations from the study for a more competitive floriculture industry in Tanzania and for improved workers productivity in flower farms:

First is through continuous training and development programmes; As indicated in the study, most of the employees in the flower farms have a low level of education (primary education). So they are more likely to do things out of ignorance calling for very extensive supervision by the farm management despite the fact that most employees reported to be knowledgeable about pesticides. This study recommends for a continuous training programmes for these employees on the use of chemicals, health and safety measures, fertigation and many other issues that are part and parcel of their working in the farm. It also came to light during the study that Tanzania Horticultural Association (TAHA) in collaboration with various service providers organizes technical training programmes for workers in the industry and it is therefore highly recommended that companies like Tengeru Flowers and others should be participants in these types of trainings.

Second is through exchange visits with other flower farms; Networking between farms is among the very important learning tools to improve productivity at the farms. This was not a common practice. The study recommends that farms should organize for exchange visits to neighboring farms to learn on what others are doing in the aspect of pest control and use of pesticides in the farms. Through this kind of inter-relationships, workers can as well learn from each other on various techniques employed in other farm, a situation that may impact positively on the workers perspective or ways of doing things.

Third is by the use of safety gears; Employees should always be provided with safety gears like gum boots, masks, overalls, gloves and also proper training on the use and handling of these gears. Strict measures should be taken to those who deliberately refuse to wear the gear as a manifestation to others on the importance of wearing the safety gears at the work place.

Fourth is certification by local and international standards; The study shows that farms that are registered with Fair Trade Organization, for instance, accrue so many benefits to employees and the neighboring communities. The study has revealed that compliance to various social, environmental and markets standards are vital to improve on the working and living standards of their employees and the communities in general. These standards include registration to international certifiers like MPS, Maxhaveller, and markets standards like traceability. In order to improve on their compliance with some environmental and human rights standards, and also to secure other international markets, the study recommends that the farms register with these certifiers.

Once a company is in compliance to some of these standards, there shall be annual audits by the respective certifier that include analysis and evaluation of employees at different levels on the understanding of various issues including pesticides hazards, etc. Despite the costs involved, this is therefore a very imperative tool in ensuring that employees are well trained.

Fifth is through Government participation-PPP; Compliance to various local and international standards is a national obligation. One of the viable ways to realize this objective is to establish a strong and strategic Private-Public Partnership (PPP). Government and its respective institutions like Plant Health Services (PHS), Tropical Pesticides and Research Institute (TPRI), Selian Research Institution (SARI) should also effectively play their respective roles in making sure that workers are well protected, educated, and working in a healthy environment. The government should also avail the necessary support and services to the farms to enable them to comply with market and other local standards. The services provided by the government institutions like inspectorate services, research and training, etc, should be very focused and effective. The Government should make sure that inspectors for example are equipped with adequate knowledge and facilities to enable them perform their respective jobs.

Sixth is by testing employees' health on a regular basis; The farms should make sure that workers working in sensitive departments like chemical spray and fertigation are tested frequently to determine the levels of chemicals residues and hormonal changes. The farms should identify a laboratory that can conduct these tests and the results should be shared openly between the expert and the respective worker. Workers affected by the products should be well taken care of as directed by the experts (DOCTORS). When there is transparency in this exercise, positive psychological contracts will be built between employees and employers.

Seventh is through efficient use of sign posters; Employee's positive attitude can also be built by site demonstrations. Sign Posters for instance, on the entry and exit time in the greenhouses after application of chemicals greatly help to educate workers on the danger of different products. This can display loudly with red color "DANGER" with the name of the product applied, application time, and entry time. The use of scouting poles with different flag Colour per pest or disease can also be a vital tool in telling workers what is happening at that particular area with some meaning like ***"do not pass here"***. This kind of signs can help to reduce the transmission of pests and diseases from one area to another due to knowledge imparted on workers.

Last but not least; Eighth is by application of other pest control mechanisms like integrated pest control mechanism like integrated pest management (IPM); Flower farms should also be exposed to other technique of controlling pests and diseases like IPM. IPM entails the use of other measures like biological control, cultural methods, cleaning, rotation of crops, to name but a few, in the control of pests and diseases while at the same time reducing significantly the use of chemicals. This will reduce significantly the potential negative effects of chemicals to the environment and workers while at the same time increase farm's compliance to Maximum Residual Levels (MRLs), a current burning market requirement. Psychologically, workers will feel safe and individual and farms productivity will be enhanced.

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Appendix 4

Students' research project of University of Sharjah

25th January 2010

RESEARCH ORIENTED CBME

The six research projects conducted by students in Year Two are examples of the “Research Oriented CBME” Taxonomy. They are all related to the concept of “CBME Oriented Towards Sustainable Development” through health promotion, prevention or reducing the burden of illness.

PREVALENCE OF HEAVY SCHOOL BAGS AMONG PRIMARY SCHOOL CHILDREN

ALKAABI F., MATTAR A., ALHUSSAIN H., AMMEN K., HUSSAIN E.
College of Medicine, University of Sharjah, United Arab Emirates

Research Advisors: Dr. Nahed Abdelkhalek and Mrs. Amal Hussein

1. The study on “**Prevalence of heavy school bags among primary school children**” reflects a common phenomenon among young school children in UAE. This may lead to serious back problems at a later age and does needs urgent intervention.

Abstract:

Objective: The purpose of the study was to identify the proportion of primary school children carrying heavy school bags in Sharjah.

Methods: The study had a Cross-sectional design. A convenient sample of 385 primary school students was selected from two governmental and one private school in Sharjah. A questionnaire was developed filled up by the students' parents. A scale was used to weigh students and their school bags. A school bag was considered to be heavy if the ratio (R) of its weight to the student's weight was $\geq 20\%$. Data was entered and analyzed using SPSS 15.0. Level of significance was set at 5%.

Results: The proportion of students carrying heavy school bags was 60%. When calculated in different grades, it was found to be decreasing as students move to a higher grade. The proportion of students carrying ≥ 10 books was 91% of whom 67% were from governmental schools and 24% from private school. Fifty eight percent of the students were carrying all the books every day to school.

Conclusion: Heavy school bags constitute a real problem that needs urgent intervention. A School Bag Awareness Day should be held to aware students, parents and schools in general about heavy school loads and the ideal weight of the school bag. Time table should be modified to reduce the number of books carried daily. Schools may also provide lockers for students to store their books.

Prevalence of Heavy School Bags Among Primary School Children

Alkaabi F.M, Abdullah K.A, Hussain E.M, AlHussain H., Mattar A.

College of Medicine, University of Sharjah

Research Course Advisors: Dr. Nahed Abdel Khalek & Mrs. Amal Hussein.

INTRODUCTION:

Carrying heavy school bags may contribute to the high prevalence of musculoskeletal symptoms observed among primary school children. (Montmans, 2006). To our knowledge there have been very few scientific studies on school bag-related problems. This study can identify the proportion of primary school children carrying heavy school bags which will help in achieving better understanding of one of the risk factors (heavy school bags) of health problems experienced by primary school children.

PROBLEM STATEMENT:

What is the proportion of primary school children carrying heavy school bags relative to their body weights in Sharjah?

METHODS:

-Design: Cross-sectional study

-Sampling: A convenient sample of 385 primary school students was selected from two governmental and one private school in Sharjah.

-Instrument: A questionnaire including questions about the way the students carry their school bags, bag contents, number of books and the periods during which students carry their bags was filled up by the students' parents. A scale was used to weigh students and their school bags. A school bag was considered to be heavy if the ratio (R) of its weight to the student's weight was $\geq 20\%$ (Xuereb, 2000)

-Analysis: Data was entered and analyzed using SPSS 15.0. Percentages, Mean, Standard Deviation were used to describe univariate analysis. Chi square test was used to correlate two categorical variables. Level of significance was set at 5%.

RESULTS:

• A total of 225 students from primary schools in Sharjah, participated in the study.

• Proportion of students carrying heavy school bags was 60%.

• Proportion of students carrying ≥ 10 books was 91% of whom 67% were from governmental schools and 24% from private school.

• 58% of the students were carrying all the books every day to school.

• 31% of students reported both back and shoulder pain while 44% reported back pain alone,

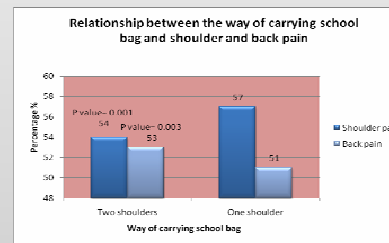
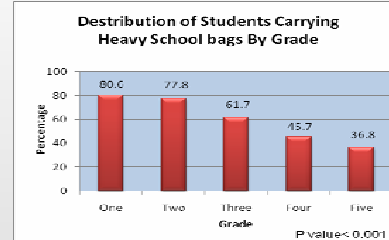
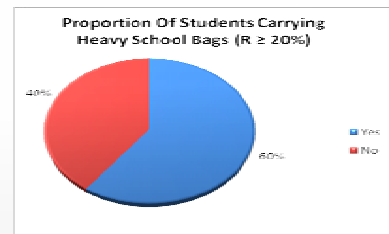
• The proportion of students carrying heavy school bags was 80.6%, 77.8%, 61.7%, 45.7%, 36.8% in grades 1-5, respectively.

• Among students carrying school bags on two shoulders, 54% reported shoulder pain and 53% reported back pain (p value = 0.001) While among those carrying school bags on one shoulder, 57% reported shoulder pain and 51% reported back pain.

• No relationship was found between number of books and school type, grade, back/shoulder pain,

• There is no significant correlation between the percentage of students carrying heavy school bags and school type, gender, number of books, back/shoulder pain.

Variable		Number	%
Gender	Male	93	41.3%
	Female	132	58.7%
Sector	Governmental	163	72.4%
	Private	62	27.6%



Discussion:

- The proportion of students carrying heavy school bags (60%) was high compared to the Italian Backpack Study (1999) that found that the average load weighed 22% of their body weight and that 34.8% of students carried more than 30% of their body weight at least once during the week (AOTA, 2002).
- The proportion decreased as students moved to a higher grade, probably because of the increase in students' weights as they grow up without a parallel increase in the number of books they carry.
- The heavy load carried by the students forced them to lean their bodies forward which in turn may have caused back pain.

CONCLUSION:

Heavy school bags constitute a real problem that needs urgent intervention. A School Bag Awareness Day should be held to aware students, parents and schools in general about heavy school loads and the ideal weight of the school bag. Time table should be modified to reduce the number of books carried daily. Schools may also provide lockers for students to store their books.

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ACKNOWLEDGEMENT:

Our sincere thanks to the following people for their generosity of helping us conducting our study: Um Salama primary school, Al Ghatfya primary school, Sharjah private school, students and their parents. Without their help, this work would never have been completed.

KNOWLEDGE AND PRACTICES RELATED TO OVER-THE COUNTER MEDICATION AMONG UNIVERSITY OF SHARJAH STUDENTS

AL-HAJ S., MIRMOGHATADEI M., AL-OWAIS A., AL-DHAHRI A., ABDULLAH K.

College of Medicine, University of Sharjah, United Arab Emirates

Research Advisors: Dr. Nahed Abdelkhalek and Mrs. Amal Hussein

2. The study on “**Knowledge and practices related to over-the-counter medication among University of Sharjah students**” has shown the need for a Health Awareness Campaign to educate the community about the use and abuse of over the counter (OTC) medications.

Abstract:

Introduction: In recent years, there has been an increasing use of Over-the counter (OTC) medications.

Objective: The aim of this study was to assess the state of knowledge and describe the practices of University of Sharjah (UOS) students regarding the use of OTC medications.

Methods: In this cross-sectional study, quota sampling method was used to select 372 students to participate from all colleges at UOS. Students suffering from chronic illnesses and non-English speakers were excluded. Data was collected by using a self-administered questionnaire of 30 questions about demographic characteristics (7 items), knowledge (8 items), attitudes (5 items), and practices (7 items) related to OTC medications. SPSS 15 was used to enter and analyze the data. Percentages, means and standard deviations were used to conduct univariate analysis. Chi-square test was used to correlate two categorical variables. Level of significance was set at 5%.

Results: Forty one percent of the total sample subjects (N= 372) were males and 59% were females. The use of OTC medications was reported by 30% (n= 112) of UoS students. Among the OTC users, 43% reported using it when pain is severe, 89% read OTC medications instructions before use and 42% of the study sample reported taking the pharmacists advice before choosing OTC medications. In case OTC was not effective, 56% of participants said that they would visit a general practitioner. 76% of the subjects were aware that OTC medications may cause addiction, and 84% believed that they can become ill from taking OTC medications.

Conclusions: The results of this study have shown the need for health awareness campaigns the aim of which is to educate the students about side effects, and appropriate usage of OTC medications.

Knowledge and Practices Related to Over-the-Counter Medication Among University of Sharjah Students

Al-Haj S., Mirmoghtadaei M., Al-Owais A., Al-Dhahri A., Abdulla K.

Research Course Advisors: Dr. Nahed Abdelkhalek & Mrs. Amal Hussein

1. Introduction

In recent years, there has been an increasing use of Over-the counter (OTC) medications (Coombes,2005). It is important that the public be aware about the risks associated with the use of OTC medications. The aim of this study is to assess the state of knowledge of university of Sharjah students regarding the use of OTC medications and describe their practices related to the use of OTC medications.

2. Problem Statement

What are the knowledge and practices related to OTC medications among University of Sharjah students?

3. Methods

•Design

The design of this study is cross sectional descriptive.

•Sample

Quota sampling method was used to select 372 students to participate from all colleges at UOS. Students suffering from chronic illnesses and non-English speakers were excluded from this study.

•Instrument

A self-administered questionnaire was used for data collection. It included thirty questions including students' demographic data (7Qs), knowledge (8Qs), attitudes (5Qs) and practices (7Qs) related to OTC medications.

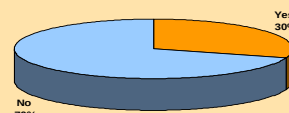
•Data analysis

SPSS 15 was used to enter and analyze our data. %, means and standard deviations were used to conduct univariate analysis . Other test were used like χ^2 test to correlate 2 categorical variables (Significance level was set at 5%)

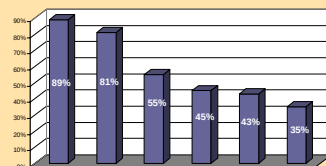
4. Results

- A total of 372 students participated in the study; 41% (n=153) were males and 59% (n=153) were females.

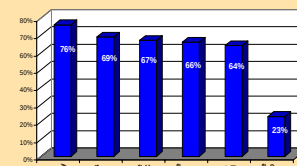
Proportion of Study Participants Using OTC Medications



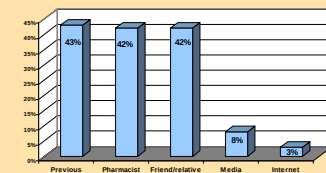
Practices of Study Participants Related to the Use of OTC Medications



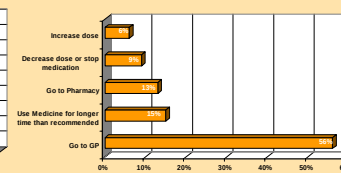
Participants Knowledge Related to the Use of OTC Medications



Source of Information behind Choosing OTC Medications



Action taken if OTC Medication was not effective



- Among the participants who said that they read the safety instructions on the package, 79.2% were aware of the fact that some OTC medications may cause addiction, and 84.1% believed that they can become ill from taking OTC medications.
- There was no association found between the college of enrollment or the level of education of the parents and the state of knowledge of the participants.

5. Discussion

- The results emphasize the accessibility of the pharmacy and its primary role in educating the public to make the best use of those medications.
- The results of this study were consistent with what was reported by Wazaifya et al (2005) that approximately 30% of people were buying OTC medications regularly and taking advice from friends and relatives, which may reflect the public's growing confidence in self-care. This is alarming especially with increasing availability of potent medications without prescription and the increased potential for interactions.
- Previous experience and advice from friend or relative were the main factors influencing the students' choice of OTC medication.
- The study showed high awareness related to the importance of reading OTC drug instructions before using it. This shows that the majority of people were aware that these medications had side-effects.

6. Conclusions

Health awareness campaigns need to be done to educate the students about side effects, appropriate dosage and effectiveness of these medications.

7. References

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8. Acknowledgment

We would like to thank the students who participated in our study for their cooperation.

OSTEOPOROSIS KNOWLEDGE AND PREVENTIVE MEASURES AMONG UOS FEMALE STUDENTS

ABDULLA D., HAMAD H., HABIBA M., SALAMIN N., BRICH S.

College of Medicine, University of Sharjah, United Arab Emirates

Research Advisors: Dr. Nahed Abdelkhalek and Mrs. Amal Hussein

3. The study on “**Osteoporosis knowledge and preventive measures among UOS female students**” indicated that female university students lack the knowledge related to a common health problem in women. Proper attention to preventive measures such as calcium intake would prevent Osteoporosis or at least reduce its risk.

Abstract:

Introduction: Osteoporosis is a silent disease mainly affecting elder females. It can be prevented by undertaking certain preventive measures early in life. Such measures include calcium and vitamin D intake, exercising, avoiding smoking and alcohol drinking.

Objective: The aim of this study is to explore the level of knowledge and preventive practices related to osteoporosis among university of Sharjah female students.

Methods: A total of 385 self-administered questionnaires were distributed among a convenient sample of female students between ages of 18-25 enrolled at University of Sharjah (UoS). The questionnaire inquired about demographic data, preventive practices and knowledge related to osteoporosis. Data was entered and analyzed using SPSS 15. Chi-square test was used to conduct bivariate analysis and level of significance was set at 5%.

Results: Eighty six percent (N=296) of students responded by filling out the questionnaire. Of the study subjects, 17% had a family history of osteoporosis. Although 86% of the study participants reported knowing that osteoporosis is a silent disease affecting the bones, 42% of them showed lack of knowledge about its risk factors. Among the medical students, 74% knew about osteoporosis compared to 33% among the non-medical. Students with a positive family history of osteoporosis were more likely to practice preventive measures against the disease (61% compared to 39%). Among the preventive measures practiced by students against osteoporosis included taking healthy diet (27%), drinking milk daily (22%), and Exercise (19%). Eighty percent of the students who did not undertake preventive measures were willing to change their habits by attending awareness programs.

Conclusions: University of Sharjah female students generally showed poor knowledge related to osteoporosis and its risk factors. Furthermore, preventive measures against the disease were practiced only by a few students. We recommend launching health awareness programs that target females in their early adulthood stage of life to increase their knowledge about osteoporosis, its risk factors, and methods of its prevention.

Osteoporosis Knowledge and Preventive Measures Among UOS Female Students

Abdulla D. ,Hamad H. , Habiba M., Salamin N. ,Brich S.

College of Medicine , University of Sharjah
Research Course Advisors :Dr. Nahed AbdelKhalek & Mrs. Amal Hussein

INTRODUCTION

- Osteoporosis is a silent disease mainly affecting elder females.
- It can be prevented by calcium and Vitamin D intake, exercise , avoiding smoking and excessive alcohol.
- The majority of osteoporosis prevention programs are focused on women in mid-life. The concern is that young women may not be aware of osteoporosis and its risk factors, and therefore will not engage in preventive behaviors.

Aim: To explore the level of knowledge and preventive practices related to osteoporosis among University of Sharjah female students.

RESEARCH OBJECTIVES

- 1) To describe the level of knowledge related to osteoporosis.
- 2) To describe the preventive measures taken by University of Sharjah female students against osteoporosis.

METHODS

▪ **Design:** Cross Sectional Design.

▪ **Sample:** A total of 385 questionnaires were distributed to a convenient sample of female students between ages 18 – 25 enrolled at University of Sharjah.

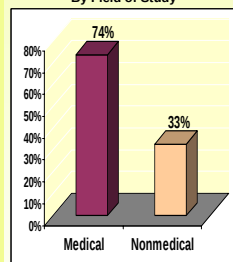
▪ **Instrument:** A self administered questionnaire was used for data collection. It included a number of questions on demographic data, preventive practices and knowledge related to osteoporosis.

▪ **Data Analysis:** SPSS 15 was used for data entry and analysis. Chi – square was used to conduct bivariate analysis and level of significance was set at 5%.

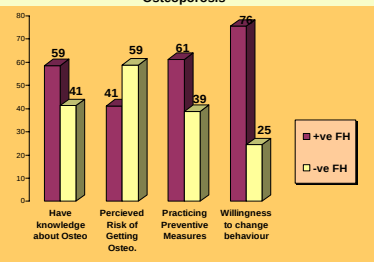
RESULTS

- The response rate to the questionnaire was 86% (N= 296).
- 85.8% of female students had heard about osteoporosis regardless of their major.
- 17.3% (N= 51.2) of the study subjects reported a positive family history of osteoporosis.
- 41.6% of the students who reported knowing osteoporosis as the silent disease that affects the bones of elder women, showed lack of knowledge in terms of its concepts and risk factors.
- 75.3% of students knew that women were at a higher risk of getting osteoporosis.
- Television and radio were the main sources of knowledge.
- 68.2% of students considered themselves not at risk of developing osteoporosis.
- 38.9% of the students that reported engaging in preventive practices had strong beliefs in undertaking the precaution adoption process.
- 80% of women who do not undertake preventive measures were willing to change their habits by attending awareness programs.

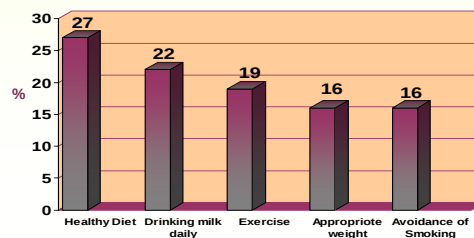
Knowledge Related to Osteoporosis By Field of Study



Knowledge & Practices of Subjects By Family History of Osteoporosis



Preventive Measures Practiced Against Osteoporosis



DISCUSSION

- In this cross- sectional study, it was observed that female students of the University of Sharjah lacked the required preventive practices although they had adequate knowledge.
- Having a positive family history enhanced engagement in preventive practices and also showed increased awareness due to the visible perception of the consequences.
- Our research may have been biased due to a limited population sample, and to the fact that there may have been some decreased focus and liability while the questionnaires were answered.

CONCLUSION

- Female students who lack knowledge about osteoporosis, due to either a negative family history or other factors, don't engage in preventive practices and therefore have an increased risk of developing osteoporosis in the future.
- Female students who have misconceptions about osteoporosis and its risk factors are least considerate in executing preventive practices and showed least apprehension.
- To help reduce the risk of osteoporosis, it is essential to increase awareness programs thereby increasing knowledge as well as preventive measures undertaken.

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ACKNOWLEDGMENT

We would like to thank the students who filled out the questionnaires and thus made this research project possible.

KNOWLEDGE AND PRACTICE OF ANTENATAL CARE IN THE UAE

ALKHATEEB A., BONNI B., SULAIMAN A., MOHAMMED H., EID M.,
ABDELHAKIM W.

College of Medicine, University of Sharjah, United Arab Emirates

Research Advisors: Dr. Nahed Abdelkhalek and Mrs. Amal Hussein

4. The study on “**Knowledge and practice of antenatal care in the UAE**” is an example of a health system research. It showed the poor compliance of pregnant women to attend antenatal clinics due to low satisfaction level of the services provided at the MCH centers.

Abstract:

Introduction: Antenatal care aims at detecting any potential problems early on in the course of pregnancy. Thus compliance with antenatal care services is essential during pregnancy.

Objective: The aim of this study is to describe women's awareness and compliance with antenatal care services.

Methods: The design of this study is cross-sectional in nature. A convenient sample of 153 pregnant women attending maternal and child health (MCH) centers in Sharjah, Fujairah, Dubai and Abu Dhabi were invited to participate in the study. An 18-item structured self administered questionnaire was used for data collection. The questions mainly inquired about demographic data, knowledge, practices and compliance to antenatal visits and medical advice. SPSS 15 was used to analyze the data. Descriptive statistics were used to summarize data and inferential statistics like Chi-square test was used to correlate categorical variables. Level of significance was set at 5%.

Results: Among study participants (N=153), 81% were locals, 42% were working, 40% had secondary level of education and 36% had university degrees. Seventy-five percent of all pregnant women reported attending antenatal care visits regularly. The "timings of appointments scheduled at MCH center" was the main reason preventing women from regular attendance of visits as reported by 89% of study subjects. Of the total sample, 91% strongly agreed that antenatal care was important, while 21% of them reported that they did not follow the advice regarding antenatal care given by the doctor. Pregnant women satisfied with the antenatal services they received were more likely to comply with antenatal care than women who were not satisfied (87% versus 4%, p-value = 0.002). Among non-working women, 60% reported compliance with antenatal care visits compared to 29% among working pregnant women (p-value= 0.025).

Conclusions: Although pregnant women attending MCH centers in the four emirates showed good level of knowledge related to the importance of antenatal visits, compliance with antenatal care was low mainly due to low satisfaction level with the services provided and the appointment system followed at these centers. Thus improving the services provided at the MCH centers is highly recommended to increase compliance of pregnant women to antenatal care visits.

Knowledge and Practice of Antenatal Care in the UAE

Alkhateeb A., Bonni B., Sulaiman A., Mohammed H., Eid M., Abdelhakim W.
College of Medicine, University of Sharjah
Research Course Advisors: Dr. Nahed Abdelkhalek and Mrs. Amal Hussein

Introduction

Antenatal care aims at detecting any potential problems early on in the course of pregnancy, informing the mother of what to expect during pregnancy and labour, and preparing the couple for childbirth and child rearing (Al-Nahi, Dale, Brown & Anderson, 1984). Women who comply with antenatal care have less complications during pregnancy (Mackey & Alexander, 2003). The main aim of this research is to describe women's awareness and compliance with antenatal care services.

Problem Statement

What is the knowledge and practices of expecting women regarding antenatal care?

Methods

Design:

The study design was cross sectional.

Sample:

A convenient sample of 153 pregnant women attending Maternal and Child health centers in Sharjah, Fujairah, Dubai and Abu-Dhabi were recruited in this study.

Instrument:

The data was collected through self-administered questionnaires that had included 18 close-ended questions; four questions were related to demographic data whereas the rest of the questions focused on assessing the knowledge, practices and the compliance to antenatal visits and medical advice.

Data Analysis:

Data entry and analysis were done using SPSS 15. Descriptive statistics such as frequencies, percentages and charts were used to represent findings. Chi-Square test was used to correlate categorical variables. Level of significance was set at 0.05.

Results

- A total of 153 pregnant women were included in the study.
- ❖ **Practice:**
 - 42% (n=64) of women reported that it was their first pregnancy.
 - 21% of women did not follow the advice regarding antenatal care given by the doctor.
- ❖ **Knowledge :**
 - 91% of pregnant women strongly agreed that antenatal care is important.
 - The majority of the women were knowledgeable about antenatal care (90%).
 - 68% of pregnant women were aware that ultrasound test, discussing delivery time and nursing should be done for antenatal care.

Characteristics of Study Subjects

Variable	% / Mean
Nationality	
Locals	81%
Occupation	
• Working	42%
• Not Working	58%
Education	
• Primary/ Preparatory	24%
• Secondary	40%
• University	36%
Age	29 years
No. of children	4
No. of pregnancies	5
Antenatal visits	5

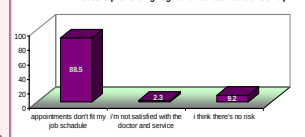
Factors Related to Compliance to Antenatal Care

Factor	Compliance	P-value
Satisfaction with Service		0.002
• Satisfied	86.7%	
• Not Satisfied	4.4%	
Education		0.031
• Primary/Preparatory	59%	
• Secondary	30%	
• University	48%	
Occupation		0.026
• Working	29%	
• Not Working	60%	
Number of Pregnancies		0.077
• <= 3	38%	
• 4 or 5	12%	
• >= 6	7%	

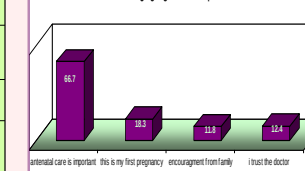
Percentage of Women Who Attended Antenatal Care Visits Regularly



Factors preventing regular antenatal care check up



Factors encouraging regular check ups & advices



Discussion

- Subjects showed high level of knowledge related to the importance of antenatal care, similar to what has been reported in other studies (98%) (Nigenda, Langer & Kuchaisit, 2003).
- Compliance to antenatal care was highly affected by satisfaction with the services provided.
- Religiously speaking, parents belief that there is a destiny, whether god sends a healthy or a handicapped baby, so they don't need to seek antenatal care.
- Culturally speaking, women don't like to announce their early pregnancy, and so they will miss their initial antenatal care visits.

Conclusions

- Workshops, lectures, media programs should be established to increase the level of compliance of the low-educated and working women to antenatal checkup visits.
- Brochures may be effective in increasing women's level of awareness related to importance of antenatal care.
- Improving the services provided at the MCH centers is highly recommended to encourage pregnant women comply with their antenatal care schedules.

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The authors would like to thank the Maternal and Child Health centers in Sharjah, Fujairah, Dubai, and Abu-Dhabi for their co-operation. They also thank Mr. Mohamed Hamad Sulaiman and Mrs. Moza Mubarak for their support and assistance.

CALCIUM INTAKE AMONG ADOLESCENT FEMALES IN SHARJAH

ALKHALIDI A, ALRAWI S, HUSSAIN A, IBRAHIM SH, MANSOUR A

College of Medicine, University of Sharjah, United Arab Emirates

Research Advisors: Dr. Nahed Abdelkhalek and Mrs. Amal Hussein

5. The study on “**Calcium intake among adolescent females in Sharjah**” highlights the importance of calcium intake among adolescent females as it is a primary preventive measure against Osteoporosis.

Abstract:

Introduction: Calcium (Ca) is an important mineral for various physiological processes in the body including building the peak bone mass during adolescence.

Objective: The aim of this study was to assess the adolescent females' knowledge about calcium, and their daily consumption of it.

Methods: A cross-sectional study was carried out. Self administered questionnaires were distributed to a convenient sample of 392 adolescent females, (ages 15-19), from government and private schools. Data was entered & analyzed using SPSS 15.0.

Results: Importance of calcium intake in the diet was appreciated by 95.3% of the study participants. Most (86.6%) recognized that Ca is important for bones, nearly half (48.1%) supported teeth health while only few (4.8%) appreciated its role in preventing osteoporosis. The majority (82.4%) regarded milk & dairy products as main dietary sources of Ca. Their knowledge was attributed mainly to schools (75%). While 94.4% adolescents knew that each age group has different daily Recommended Dietary allowance (RDA) of calcium, 100% of private & 89.6% of government schools, only 23.8% knew the exact amount for their age group. The streams seem to affect the adolescent females' knowledge regarding the RDA of Ca as shown from the reports of the students belonging to science (66.7%), art (14.3%) and grade 10 (0%). Of the population, 43.9% reported not drinking. The main reason given for not drinking milk was dis-likeness (36.5%). Only 18.9% of the study population consumed the appropriate amounts of calcium relative to the age group.

Conclusions: Educational programs & extracurricular activities directed towards building awareness about the importance of calcium intake and its daily RDA, should be conducted

CALCIUM INTAKE AMONG ADOLESCENT FEMALES IN SHARJAH

Alkhalidi, A., AlRawi, S., Hussain, A., Ibrahim, Sh., Mansour, A.
College of Medicine, University of Sharjah
Research Course Advisors: Dr. Nahed Abdelkhalek & Mrs. Amal Hussein

1 INTRODUCTION

Later in their life, females are at risk of developing diseases like osteoporosis as a result of hormonal changes that affect the bone (Martin, et.al, 2004). Calcium (Ca) is the mineral that protects against Osteoporosis as it aids in building the peak bone mass (PBM) in adolescence (Hernandez-Rauda & Martinez-Garcia, 2004). Furthermore, correct patterns of eating behaviors are formulated during this age.

For proper calcium intake and practice, only knowing about calcium's importance is inadequate; awareness of the recommended dietary allowance (RDA) of calcium and the appropriate resources for it is also needed to accomplish the maximum benefit from calcium intake.

The aim of this study is to assess the adolescent females' knowledge about calcium, and their daily consumption of it.

2 PROBLEM STATEMENT

What are the knowledge, and the practices of calcium intake among adolescent females in Sharjah?

3 METHODS

Design: Cross-sectional study design was used.

Sample: A convenient sample of 392 adolescent females (ages 15-19), who attended one governmental and one private secondary schools in Sharjah, was selected to participate in this study. Students who were taking calcium supplements or were taking calcium as a medication were excluded from the sample.

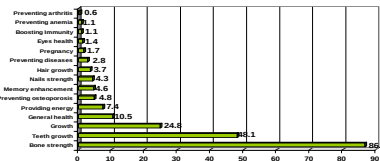
Instrument: A self administered questionnaire comprising of 22 questions was used to assess the adolescent females' knowledge on importance of calcium, its RDA and its food sources. It also asked about the individuals' inclusion of Ca-rich foods (like milk, cheese and yoghurt) in their diet. The questionnaire contained tables that were used to calculate the students' intake of Ca from Ca-rich foods.

Data analysis: Data was entered & analyzed using SPSS 15.0, frequencies & percentages were used to describe the sample, whereas Chi square test was used to correlate categorical variables & a p-value of less than 0.05 was considered statistically significant.

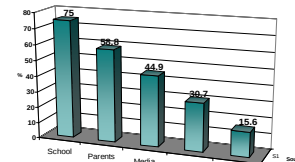
4 RESULTS

- A total of 392 subjects participated in the study. (32 were not eligible according to the exclusion criteria).
- 95.3% of the study population appreciated the importance of calcium in the diet.
- 94.4% of the general study population knew that each age group has different RDA of calcium (100% of private school students as compared to 89.6% of government school students (p -value < 0.005).
- 89.3 % among the local students knew that the daily RDA of calcium intake differs for different age groups compared to 99.4 % among the non-locals (p -value < 0.005).

Ca Importance as Perceived By Adolescent Females



Sources of Information Related to Calcium Intake

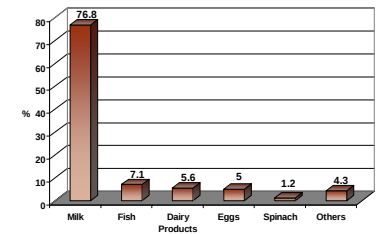


- 23.8% of the students knew the exact daily RDA of calcium intake for their age.
- 66.7% among science students (juniors & seniors) were knowledgeable about the RDA of Ca for their age compared to 14.3% of art students (juniors & seniors) & none of the sophomore students (p -value=0.012).
- 43.9% of the study population did not drink milk.
- Study population revealed that locals (50.3% of population, N=181) showed a similar intake of milk to that of non locals (49.7% of population, N=179).

Among students who reported that they do not drink milk, 80% stated that the main reason is that they do not like milk, 2.3% stated that drinking milk is not important, 1.1% didn't drink because their friends did not, and 1.1% stated that it's not available at their residence.

We found that only 18.9% were consuming normal or above normal levels of calcium in their daily diet.

Sources of Calcium As Perceived By Adolescent Females in Sharjah



5 DISCUSSION

- Harel et al (1998) found that while adolescents are aware of the main health benefits of calcium, they lack specific information about daily requirements, and this was similar to our findings.
- Private school students showed better knowledge about the fact that the RDA of calcium intake differs for different age groups. The difference may be accounted for by the higher quality of Health promotion programs conducted for the students in the private school.
- Students in the science stream were more knowledgeable about the RDA of Ca for their age compared to students in other streams, suggesting that the academic curriculum can be targeted to improve students' level of knowledge regarding Ca.
- 56.1% of the study population did drink milk & this constitutes a protective factor against long term bone complications as evidenced by some researches that stated that calcium or milk supplementation in adolescence is beneficial for bone health for a long term, even after discontinuation of supplementation. (Kalkwarf, 2007)

6 CONCLUSION

The extent of knowledge on the importance of calcium among adolescent females lacked the specific details of calcium intake, as most of them did not know its RDA & did not recognize its importance in preventing chronic diseases like hypertension, colon and breast cancer. Health promotion programs are recommended regarding calcium that inform of its daily RDA in respect to the age groups and the significance of calcium in various aspects. Nearly half of the sample did not drink milk and this should be given special attention by carrying out awareness programs in schools such as a "school breakfast or brunches" containing calcium-rich foods.

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PREVENTIVE MEDICAL CHECKUP PRACTICE AMONG ADULTS IN UAE

EISSA A., AL-GHAFLI A., AL-ZAABI S., EASA N., OMAR I.

College of Medicine, University of Sharjah, United Arab Emirates

Research Advisors: Dr. Nahed Abdelkhalek and Mrs. Amal Hussein

6. The study on “**Preventive medical checkup practice among adults in UAE**” indicated the need to address the importance of routine medical checkups for early detection and prevention of common health problems such as cardiovascular diseases, breast and prostate cancer.

Abstract:

Introduction: Routine medical checkup includes clinical preventive services delivered by primary health care clinicians to persons with no signs and symptoms of illness. The aim behind it lies in the early detection and treatment of any potential health problem.

Objective: This study aims at exploring whether medical checkup is a common practice among adults in UAE.

Methods: In this cross-sectional study, a snowball sampling method was used to enroll a total of 385 subjects. Self-administered questionnaires were distributed to students and employees between 18-60 years old in different universities in UAE. The 28-item questionnaire inquired about the respondents' demographic information, past medical history, personal knowledge and practices related to routine medical check-up. SPSS 15 was used for data entry and analysis.

Results: A total of 369 subjects participated in this study (response rate = 95%); 20% males and 80% females. The mean age of study respondents was 20 (range 18 to 60). Among the study subjects, 42% reported doing routine medical checkups: blood pressure (70%), vision checkup (60%), dental examination (50%), blood sugar level (46%), blood cholesterol level (31%), and heart function test (23%), breast examination (15% and bone scan (14%) Among those doing routine checkups, 60% did it once a year. The main factors that prevented subjects from doing routine checkups were lack of time (14%) and the perception of being healthy (9%). Having a family history or past medical history of disease was not significantly related to the practice of preventive medical checkup. Eighty-five percent of study participants were interested to know about the importance of medical checkups.

Conclusions: Less than half of the study participants reported doing routine medical checkups. National campaigns, TV programs and radio talks addressing the importance of routine medical checkups might play a role in increasing the awareness of the community about the importance of medical checkups and consequently encouraging them to pursue preventive healthcare services.

Preventive Medical Checkup Practice Among Adults in UAE

Eissa A., Al-Ghafli A., Al-zaabi S., Eesa N., Omar I.

Research Course Advisors: Dr.Nahed AbdelKhalek and Mrs. Amal Hussein

1 Introduction

The routine medical checkup includes clinical preventive services usually delivered by primary health care clinicians to persons with no signs and symptoms of illness as part of a routine health care process (Culica, Rohrer, Ward, 2002). Regular medical check-ups will detect any possible problems, in order to take steps in either preventing them or starting early treatment. The aim of this study was to explore people's perception about the importance of medical checkup, identify the reasons that may prevent it from becoming a common practice and assess the prevalence of doing annual medical checkup among adults in UAE .

2 Problem statement

Is medical checkup a common practice among adults in UAE?

Materials and Methods

Design: The study design had a cross-sectional design.

Sample: A non-probability, snowball sampling method was used to enroll study subjects. 385 questionnaires were distributed to students and employees who were within the age limit of (18-60) years old in 3 different universities in UAE.

Instrument: Data was collected by using self-administered questionnaires. The questionnaire included 27 questions, which were divided into three sections: demographics, past medical history, personal knowledge and practice related to routine medical check up.

Data analysis: SPSS 15 was used to enter and analyze the data. Percentage, mean and standard deviation were used in univariate data analysis. Chi-Square test was used in bivariate data analysis .A p-value of (0.05) or less was considered statistically significant.

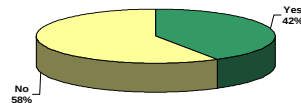
4 Results

Demographic Data

	Male	Female	University Education
Number	74	295	346
%	20.10%	79.90%	93.80%

- Response Rate was 94.85 % (N= 369)
- The mean age among study subjects was 20 years (range 18 to 60).
- Out of the participants who reported doing medical checkup (N=153), 73.2% did the checkup in UAE, and 59.5% did it once a year.
- Main factors preventing participants from doing medical checkup were lack of time (14%) and feeling healthy (8.5%).
- 66.7% (n=246) of the participants had an idea about what medical checkup referred to.

Percentages of Study Participants Doing Medical Checkup



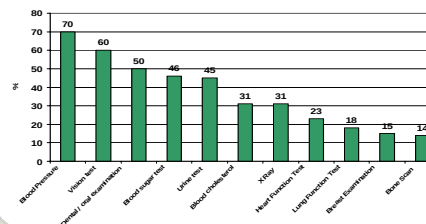
4

- Among (66.7%) of subjects who know what is medical checkup, (80.9%) do the medical checkup.
- No significant relation between age, time consumed by checkup, hospital environment during the examination and the equipments that are used and frequency of medical checkup.
- No significant relation between doing medical checkup and family history of any diseases and past medical history of any disease.

4

- Among (369) subjects, 58% (n=214) reported shortage of campaigns for the medical checkup in UAE.
- 85.4% (n=315) of participant would like to increase their awareness about the medical checkup.

Tests That Are Done During the Medical Checkup



5 Discussion

- The results of this study demonstrated that most adults in UAE (94.3%) believed that the medical checkup is important to be done every 1 year. That supported one of the study done in 1997 and 1998 that 66% of the 1200 adults believed that an annual physical examination was necessary (Oboler et al, 2002) .That reflects people's awareness and the good knowledge about medical checkup although the practice was (41.5%) in UAE which is low as compared to other studies in USA (62%) (Culica tal, 2002).
- Level of education, monthly income and having health insurance in UAE were not influencing people's decision about doing medical checkup contradictory to what was found in a study done in USA(Gherrington et al, 2007), because of cultural differences.
- The snowball sampling method did not result in a representative sample of the population; it included mostly university educated subjects,

6

Conclusion

People's knowledge about medical checkup and their beliefs about the importance of doing the checkup are the most important factors effecting people's decision in doing the checkup. So, we recommend national campaigns, TV programs, radio talks and websites to increase people's awareness about medical checkups.

7

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Project members

- Japan : Yuko Takeda, MD, PhD
Dept of Community-oriented Medicine, Mie University School of Medicine, Mie
Hideki Yamamoto, MD, MPH, PhD
Graduate School of Environmental Science, Okayama University, Okayama
Eugene Boostrom, MD, MPH, DrPH
Meio University Research Institute, Okinawa
Katsuhiko Ando, PhD
Center for Medical Education, Mie University School of Medicine
Hiroki Hori, MD, PhD
Center for Medical Education, Mie University School of Medicine
Sumiko Ogawa, MMed Sci, MPH, PhD
Faculty of Human Health Science, Meio University, Okinawa
- Thailand : Department of Community Medicine, Faculty of Medicine, Khon Kaen University
Pattapong Kessomboon, MD
Sauwanan Bumrerraj, MD
Piyathida Kuhirunyaratn, PhD
- Lao PDR : Division of Community Medicine, Faculty of Medicine, University of Health Sciences
Kamphanh Prabouasone, MD, DTM&H, MCTM
Anousavanh Sanaphay, MD, MPH
- UAE : Dept of Community and Family Medicine, College of Medicine, University of Sharjah
Nahed Abdelkhalek, MPH, DrPH
- Tanzania : Muhimbili University of Health and Allied Sciences
Anna Tengia Kessy, MD, MMed
Dept of Community Health, School of Public Health and Social Sciences
Simon Mamuya, PhD
Dept of Environmental and Occupational Health, School of Public Health and Social Sciences
Francis Fredrick Massawe, MD
Dept of Pediatrics and Child Health, School of Medicine