



## Ministry of Health & Population

### Sector of Integrated Services & Nursing

### Integrated Nutritional Health Program

Minia Governorate

In Collaboration with

**TAHSEEN-Pathfinder International**

&

Health Care International, *HCI*

## Final Report

December 2005

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**Sector of Integrated Services & Nursing**  
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## **List of Acronyms**

<b>ASCE</b>	Adolescents and Social Change in Egypt Survey (National Survey of Egyptian adolescent)
<b>BMI</b>	Body Mass Index
<b>DHS</b>	Demographic Health Survey
<b>gm/dl</b>	Gram/deciliter= gm/100 ml
<b>H</b>	Height
<b>HB</b>	Hemoglobin
<b>HCI</b>	Health Care International
<b>HDI</b>	Human Development Index
<b>HIO</b>	Health Insurance Organization
<b>MOE</b>	Ministry of Education
<b>MOHP</b>	Ministry of Health and Population
<b>N</b>	Numbers
<b>NCHS</b>	National Center for health statistics
<b>NGO</b>	Non-Governmental Organization
<b>Std. Dev</b>	Standard Deviation.= S.D.
<b>W</b>	Weight
<b>WHO</b>	World Health Organizations

**COMPREHENSIVE REPORT**  
**ON**  
**KAP ASSESSMENT OF NUTRITIONAL HEALTH**

**A. Background and Introduction**

The KAP Assessment of Nutritional survey in Minia Governorate is a collaboration of Tahseen/Pathfinder International with MOHP/HIO, in association with HCI. The KAP Assessment of Nutritional survey was conducted in November and December 2005 to provide a baseline assessment as a pre-requisite for the design and implementation of nutrition programs; an essential goal for improving health status of those vulnerable groups and to achieve a healthy life and proper development of those groups.

Malnutrition is one of the priority health problems in Egypt, which is more prominent in some groups as children under 5 years, children of school age, adolescents and women in reproductive age

Many studies in Egyptian villages showed negative effect of malnutrition on growth, performance, mental capabilities and disease resistance ,which in turn have its bad effect on health.

Malnutrition due to protein deficiency (PEM) is still one important health problem affecting children. The DHS 2003 results showed that 16% of children under 5 years are stunted and 6% are severely stunted. Rural children are more likely to be stunted than urban children (17% vs. 14%). The percentage stunted varies by place of residence from 10% in urban Lower Egypt to 22% in rural Upper Egypt. Overall, 4% of Egyptian Children are wasted. Differences in wasting levels are generally minor across the subgroups. Nine percent of the children under 5 years are underweight.

The trends of the nutritional status suggest that the nutritional status of young children in Egypt has improved since the early 1990s in which the stunting rate improved from 26% in 1992 to 16% in 2003.

The 1997 National Survey of Adolescents found that 17% of adolescents were stunted and 9% were wasted. On the other hand, 10% of adolescents were found to be at risk of over weight.

Micronutrients deficiency also poses an important threat to children, adolescents and women in reproductive age. Three deficiencies: vitamin A, iron and iodine are of particular concern. The serious adverse effects of the deficiencies are also well documented.

High levels of vitamin A deficiency lead to night blindness. Even mild levels of vitamin A deficiency impair the immune system, reducing children's resistance to diarrhea and measles, and increasing infant mortality by as much as 25 percent. An estimated 12% of young children are deficient in vitamin A according to a national survey conducted in 1995, with only minor regional variations, which means that vitamin A deficiency is of moderate public health importance according to global WHO epidemiological criteria.

Severe anemia is life threatening for young children while moderate anemia in pre-school years even if treated, permanently reduces coordination and balance, limits attention spans and shortens memory capacity. Most Egyptian children suffer either mild anemia 19% or moderate anemia 11% but severe anemia is relatively low 0.2%. Anemia levels are highest in the frontier governorates and Upper Egypt and are higher in rural compared to urban through the country.

Inadequate iron intake is the main cause of anemia. A 1995 study found that 90% of children consume iron-rich food (meat, fish and poultry) less than three times a week and that 70% do not get their recommended daily allowance of iron.

The DHS 2000 found that iron deficiency anemia (mostly mild) affects close to third of Egyptian adolescents ranging regionally from 38% in frontier governorates to 27% in Urban Lower Egypt. The survey found that the prevalence rate was slightly higher among boys (30%) than among girls (29%). The 1997 National Survey of Adolescents found an even higher level (47%) of anemia among adolescents. It also found that children with anemia were more likely to be stunted and underweight.

Iodine deficiency also constitutes an important public health concern. Sub-national surveys have found rates of goiter ranging from 52% to 82% of children in New Valley Governorate and from 12% to 43% of children in other regions (1999).

A study conducted in 2004 by MOHP in some primary schools in Giza governorate showed that goiter was found in 8.6% of urban children and 12% of rural children.

Some health surveys conducted in 2000/2001 by the Community Component of Integrated Management of Childhood Illness Program (IMCI) found that among community members' particularly mothers', nutritional behavior and health awareness had a great effect on the health status of family members (children, students and mothers) e.g.

- Late starting of breast feeding
- Early introduction of weaning foods
- Low level of practicing exclusive breast feeding for the first six months of age
- Lack of correct information about feeding and malnutrition among community members especially mothers.

Malnutrition and feeding problems could be due to direct and indirect causes:

***The Direct Causes***

- Inadequate quantity or quality of foods
- High morbidity rates among children (diarrhea, ARI diseases ...etc.)
- High prevalence of intestinal infestation.
- Low nutritional awareness among community members.

***The Indirect Causes***

- Lack of food availability
- Lack of care for the vulnerable groups.
- Poor environmental status (safe drinking water, good sanitation .....etc.)

A comprehensive program is needed to overcome the malnutrition problems among vulnerable groups. This program aims at:

1. Increasing health and nutrition awareness among the different categories in community.
2. Improving the nutritional activities in the health facilities and schools
3. Evaluating the level of community nutrition awareness
4. Assessing the nutritional status of children, students and females in reproductive age on regular basis
5. Improving environmental situation

***Study Site Background***

*(Minia Governorate)*

Minia governorate is one of the Upper Egypt governorates. Minia's current population of 3.7 million is primarily rural, only 19% lives in urban areas. The governorate ranks near the bottom in the Human Development Index and its population has among the lowest life expectancy of any of Egypt's governorates (65.4 years).

Minia governorate is divided administratively into nine districts. Three-quarters of Minia's households live in free-standing dwellings. This compares to 43% of all households in Egypt as a whole. The majority of households in Minia own the houses or apartments in which they live. Nearly all households (97%) have electricity and 75% use gas for cooking. Kerosene is the predominant cooking fuel among households not using gas.

Almost half of the households (49%) live in dwellings that have dust floors, this is three times more than the national figure of 15%. Within the governorate, dust floors are much more common in rural dwellings (58%) than in urban dwellings (17%).

Drinking water and sanitation facilities directly influence the health and well-being of household residents. Minia's households are less likely to have access to piped water in their residence than households in Egypt as a whole (68% and 86% respectively). Households that lack access to piped water within dwelling obtain water from a public tap (13%) or covered well (18%).

Urban households are much more likely than rural households to have access to piped water in the dwelling, 91% and 61% respectively. Minia's households are much less likely than households in Egypt as a whole to report that their dwellings are connected to a public sewer system (6% and 54% respectively); all of them are found in urban areas in the governorate.

Less than half of all households with toilets have a place for hand washing adjacent to the toilet and only 16% have all the items (water tap, soap/ash, a basin, and towel cloth) considered necessary for hand washing. Urban households are much more likely than rural households to have a place for hand washing near the toilet and to have the appropriate other hand washing materials.

With regard to disposal of kitchen waste and trash, 22% of Minia's households have their waste collected from home or from containers in the street compared to 39% of household nation wide. Within Minia, waste collection is more common among urban households (60%) than rural households (11%).

Households in rural Minia are significantly poorer than urban household, nearly 60% of rural households in the governorate rank in the bottom wealth index quintile compared to 16% of urban households.

Gender differences in school attendance levels favor males in Minia and in Egypt as a whole. However, the gender gap is much larger in the governorate than in the country as a whole. Among children age 6-15 years, the difference in attendance rates between boys and girls during the 2002-2003 school year was 14%. Points in Minia are more than twice the difference observed for the country as a whole (5% points).

## **B. Objectives**

*HCI* technical approach focused on achieving the following objectives in the selected 8 communities in the three districts of Minia Governorate to achieve the following objectives:

### ***General Objective***

The goal of the study is to improve the health and nutritional status of community members through raising nutritional awareness.

### ***Specific Objectives***

- Identify the level of nutritional awareness among different community categories:
  - A. Health providers
  - B. School teachers
  - C. PHC attendants
  - D. Community leaders and NGOs members.
- Evaluate the nutritional activities provided in health facilities and schools (primary and preparatory).
- Assess the nutritional status of a sample of school children (primary and preparatory) through comprehensive clinical examination, laboratory investigations (urine, stool, blood) and anthropometric measures (weight and height).

## **C. Methodology**

Within the overall framework of TAHSEEN/Pathfinder objectives and activities, the *HCI* worked closely with TAHSEEN/Pathfinder specialists and MOHP staff to fulfill the following activities:

### ***Activity I:***

KAP study of different target groups at 8 communities in Minia Governorate.

### ***Activity II:***

Medical examination and laboratory investigation for school students selected from the 16 schools to assess their general health status and identify malnutrition problems.

The program started by reviewing the already designed tools, documents and reports needed for developing the implementation plan. Protocols and guidelines were fully reviewed and put into consideration. Preliminary work plan and time table were prepared and study tools were initially identified. As part of the close collaboration with TAHSEEN-Pathfinder International and MOHP, and to maximize the benefit of previous efforts conducted, HCI utilized some of MOHP designed tools to be used in the study in hand; that is the six forms of the study questionnaire. Such forms were tailored to meet the study's main objectives. The process of designing the data capture files on SPSS was completed. Required official communications and authorizations were obtained.

- ***Conducting a Preparatory Meeting:***

All involved parties were invited to a preparatory meeting in the Ministry of Health & Population on November 6<sup>th</sup>, 2005. Participants included key representatives of MOHP, MOE, and HIO. Dr. Essmat Mansour, Head of Integrated Health Care Sector, headed the meeting. The meeting focused on preparing a protocol for coordinating the Community Nutritional Awareness Program, identifying the role of all participating organizations and funding agencies. The Protocol was presented to all concerned agencies – including Health Insurance Organization (HIO), National Institute of Nutrition, and Ministry of Education (MOE) – for their approval. A central supervisory team from the MOHP was assigned to conduct a two-day visit to Minia Governorate set on November 19<sup>th</sup> – 20<sup>th</sup>, 2005 to oversee the Program's preparatory phase.

- ***Conducting a Two-Days Workshop:***

A two-day orientation workshop was conducted in Minia Governorate on November 19<sup>th</sup> – 20<sup>th</sup>, 2005 for all concerned parties, and was overseen by the MOHP supervisory team – as stated above. Participants included representatives of the Ministry of Health and Population, local health leaders of Minia Governorate, Ministry of Education, 8 Non-Governmental Organizations, scientific experts, and other nominated participants. The workshop aimed at acquainting the participants with the study's main objectives, target groups and tools to ensure their full commitment and official support. In this respect, the study's preliminary work plan and timetable prepared by **HCI** were presented for consensus (see Annex III for Work Plan and Timetable). Moreover, the study tools were discussed and amended based on the participant's feedback, and a semi-final questionnaire form was prepared for the pilot survey. A final agreement on the study sites and the pilot study samples was reached.

**HCI** had selected the research team from the nominated participants. The selected research team participated in an orientation session on conducting the study using the suggested instrument tools. The orientation focused on training the research team on implementing the study in hand, identifying their exact role in the study, and clarifying any inquiry they had concerning the study in general. After the orientation, the research team was expected to apply the set research methods on the pilot study. During this initial phase, **HCI** provided full guidance and support to the research team for detection of any obstacles or inquiries from the team's side concerning the implementation.

- ***Development and Approval of the Implementation Plan:***

The Implementation Plan was finalized and approved based on the preparatory meeting discussions and the feedback of the meeting participants. The Plan indicated the selected study areas, the target respondents, the study team, the study tools (including the finalized questionnaire forms), and an actual timeframe for implementation. The survey methodology included the medical examination of the students. A consensus on the pilot study sample and the quality assurance survey was also reached.

- ***The Pilot Study***

The pilot study was conducted to test the appropriateness of the study tools to the local setup subject to study. It was also meant to add to the experience of the selected team and benefit from their feedback during the actual implementation.

Hence, needed improvements were performed prior to the actual implementation of the study. The pilot study sample was extracted from the target groups as follows:

From students, teachers, and educational kitchen:

- Grade 4 was selected from the following 2 primary schools:  
Salah El-Din Primary School and Language Primary School.
- Grade 1 was selected from the following 2 preparatory schools:  
Suzan Mubarak Preparatory School and Language Preparatory School.

From Healthcare providers, mothers, and community leaders: the following four HCUs were selected:

- Medical West Center,
- Medical East Center,
- Child Care Center – first; and
- Child Care Center – second.

The Pilot Study Extracted Sample was as follows:

<b>Selected Sample</b>	<b>Study Conducted</b>	<b>Number of Respondents</b>
2 Primary and 2 preparatory school students (for both primary and preparatory grades)	KAP Interview	100
2 Primary and 2 preparatory school students (for the same group)	Medical Examination	100
HUs health care providers (physicians, nurses, lab technicians, and "raaidat")	KAP Interview	19
Community representatives (women in reproductive age visiting HUs, teachers, and community leaders)	KAP Interview	48

Through the extracted sample, the instrument tools were field tested. Furthermore, each team involved in the pilot study was required to provide an overall feedback on

all technical and administrative constraints faced during the implementation. The pilot study therefore resulted in major reconsiderations on both technical and administrative levels. Technically, instrument tools were readjusted to facilitate the field work of the study team, and to guarantee more clarity to studied community groups. Administratively, roles of each team member were reemphasized and clearly specified to avoid any probable overlapping in responsibilities.

- ***Conducting a Post-Pilot/Pre-Implementation Meeting:***

A second orientation meeting was conducted in Minia on November 28<sup>th</sup>, 2005 for involved parties. Participants included six representatives of HIO, two MOHP representatives, Minia MCH Director, and MCH Deputy Director. The meeting's objectives were: to review and agree upon the final version of the instrument tools, to answer any additional inquiries concerning the implementation phase, to finalize the logistical and administrative issues, and to approve the final Implementation Plan, including the actual Work Plan and Timetable for the study. The meeting outcome included a final implementation schedule for the actual initiation of the study.

- ***Implementing the Survey:***

The actual starting date was set on Saturday, December 3<sup>rd</sup>, 2005 for 3 days. After three days of the study startup, another meeting was planned on December 6<sup>th</sup>, 2005 to discuss work progress. The actual fieldwork restarted on Wednesday, December 7<sup>th</sup>, 2005 as demonstrated in the work plan and timetable schedule (Annex III)

- ***Conducting a Follow-up Meeting:***

A follow-up meeting was conducted in Minia on December 6<sup>th</sup>, 2005 for representatives of all involved parties. The main objective of the meeting was to follow-up on work progress and to update the participating agencies with latest developments. The action plan was discussed with detailed illustration on the formation of the research teams, the study areas covered, the number of questionnaires filled, and the actual time for filling them. Accordingly, deadlines for finalizing the survey activities were set. The initial results of the Quality Assurance survey were also presented, providing a clear indicator of the quality of work

conducted so far. The meeting discussions revealed some major constraints that faced the research team during the implementation. Therefore, one of the meeting's positive outcomes was the recommendations reached to overcome such constraints.

- ***Field Visits:***

Frequent field visits by the supervisory team from both HCI and involved parties had a remarkable impact on the quality of the survey. Through such visits, a close follow-up on the work progress was achieved; facilitating the process of detecting any upcoming obstacles facing the implementation phase. Corrective actions/measures were taken; guaranteeing a continuous quality improvement process.

- ***QA Survey:***

The QA survey was one of the major elements of the study in hand. It provided the research team with solid indicators on the quality of the data collection process, which is a significant step to assess the quality of the final output. The QA team was formed of MOHP, HIO, and HCI, and supervisors. The data collection phase was validated through a quality assurance survey conducted on a random sample extracted from the total selected sample. Around 5-10% of the respondents were re-interviewed and the results were verified against their corresponding conducted interviews.

### ***QA Survey Outcome***

There was a fairly high level of concordance between quality control results and original survey results. The overall non-concordance (disagreement) was 9% for Form A (medical history, medical examination, anthropometry and laboratory findings of primary and preparatory students), 18% for Form B (knowledge, beliefs and practices of primary and preparatory students), 15% for Form C (knowledge, beliefs and practices of health care providers) and 12% for Form D (knowledge, beliefs and practices of community members<sup>1</sup>). This percentage of disagreement, although within the acceptable range may be due to several factors:

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<sup>1</sup> For quantitative data (such as height and weight), correlation coefficients (r) were calculated between original survey data and quality control data. For heights and weights the correlation was very high (r= 0.973 for height and r = 0.967 for weight).

- a. The interviewed person may have changed his/her mind between the original interview and the quality control interview, this could be more frequent with children (therefore the B form has the highest non concordance of 18%).
- b. The interviewed person may have been sensitized by the interview and tried to seek information in between the interviews.
- c. Many questions refer to giving examples for food sources for certain items or certain malnutrition deficiencies. The interviewed person may prefer to give other examples in the second interview, especially so if he discussed the issue with others in between the two interviews.
- d. Certain clinical findings may change between the two examinations (chest findings, functional non-organic hemic murmurs, or pediculosis). Taking into consideration the above mentioned sources of response variation, the overall concordances between the original survey findings and those of the quality control falls within the acceptable realm.

- ***Data Management Phase***

*Data Collection:*

After identifying the study sites, the targeted community groups and the study team, in addition to specifying the pilot study sample – as detailed earlier – the data collection process had started. Filled forms were gathered from different studied sites and were sorted to be ready for data entry process.

*Cleaning and Coding:*

A specialized team was assigned to scrutinize the data collected for any missing or unclear information. Missing data were completed through direct contacts with field researchers. Invalid forms – which represented an insignificant percentage of the total forms – were discarded. The coding process then started and a Coding Book was developed by a specialized professional (See Annex II). The first section of the developed Coding Book included the overall coding policy applied on the six forms of the questionnaires; that is, each mentioned item was given the same code number in all the six forms. Then, a specific coding policy was developed for each of the six questionnaire forms for items not included in the general coding table. Such coding policy was meant to unify the coding of mentioned items in all the forms in hand;

thus avoiding unnecessary recoding. All gathered forms were then coded with the guidance of the developed Coding Book.

*Data Entry:*

The data entry process was conducted by a group of specialized database administrators to guarantee accuracy.

*Data Analysis:*

The data were then analyzed using SPSS Software Program version 11.5 to reach the accurate results.

## **Overall Methodology**

### **The Study Team:**

*HCI* recruited an MOHP team and an HIO team for each district. Each team included one supervisor and the data collectors relevant to each targeted category. For interviewing mothers, students, teachers, NGOs staff, and community leaders, *HCI* assigned social workers. Physicians were assigned to interview physicians, nurses, and health workers (including laboratory technicians and assistant technicians) in the PHC units. Conducting medical examination on selected students required four-member teams of a physician, a nurse, a laboratory technician, and a dentist.

### **Selected Sites:**

The following three districts were selected from Minia Governorate: Minia, Samaloot, and Mallawi. A total of eight rural sites - representing eight "communities" - were selected from the above three districts as follows: two sites from Minia (Sawada and Saft El-Gharbia), four sites from Samaloot (Tiba, Terfa, Shoosha, and Al-Amoudein), and two sites from Mallawi (Touna El-Gabal and Deir Abou Hennis). Two schools were selected from each of the eight rural sites: one primary school and one preparatory school; which forms a total of 16 schools in all selected sites. One class was selected from each school, with a total of 16 classes.

### **Identified community target groups:**

The target groups were selected from the following categories:

- Schoolchildren at preliminary and preparatory schools;
- Women in reproductive age among mothers visiting PHC units;
- Health teams in PHC units;
- Teachers;
- Natural leaders including religious leaders; and
- NGOs' representatives.

The gender of the studied sample members was also put into consideration in the implementation phase. The study team aimed at achieving a balanced presentation of both males and females, whenever possible.

The exact number of interviewed respondents per each form is listed below:

Form A: a total of	826 respondents
Form B: a total of	788 respondents
Form C: a total of	83 respondents
Form D: a total of	669 respondents
Form E: a total of	16 respondents
Form F: a total of	8 respondents

### **The Study Tools:**

- **Questionnaire**

One of the major study tools was the six-form questionnaire (See Annex I). *HCI* utilized the already-existing six forms developed by MOHP to be used on the study in hand. Significant adjustments were done to tailor the six forms to suit the identified target groups. Amendments included language simplification to meet the respondents' educational and social level. Some questions were also rephrased – based on the researchers' feedback – to guarantee clarity and avoid confusion among both respondents and interviewers. Some open-ended questions were redesigned to provide suggested choices in a way that served the data analysis phase. The final questionnaire output was as follows:

Form A: Students' Medical Lab Examination Questionnaire: This form was designed to indicate the student's medical history and dental examination. Signs of nutritional deficiencies were also detected. In addition, anthropometric assessment and other related investigations were conducted. Medical information in hand was correlated to the student's anthropometric data to indicate the effect of nutrition awareness on students' health (as illustrated in the data analysis section). Form A's target respondents were schoolchildren at preliminary and preparatory schools (first targeted category).

Form B: Students' Nutritional Awareness Questionnaire: This form was used to indicate the students' daily nutritional practices. It examined students' general information on nutrition related issues such as meaning of "malnutrition", balanced meal, and benefits of food elements to human health. Through gathered information, students' nutritional awareness was assessed. Form B was also prepared for

schoolchildren at preliminary and preparatory selected schools (first targeted category).

Form C: Nutritional Awareness of Health Care Service Providers Questionnaire: This form assessed the nutritional awareness of health care service providers in selected research areas. It targeted health teams in PHC units.

Form D: Community Awareness Questionnaire: The form was designed to assess the community nutritional awareness. Its respondents were selected from women in reproductive age among mothers visiting PHC units, teachers, natural leaders including religious leaders, and NGOs' representatives.

Form E: Questionnaire on Nutritional Services Provided at Schools: This form was developed to assess the nutritional services provided at targeted schools, indicating kinds of food available and students' choices of available kinds. It also measured the level of nutritional awareness within the school community, and adequacy of hygienic conditions in the school cafeterias, if any. It targeted teachers and school administrators from selected schools.

Form F: Questionnaire on Nutritional Awareness Services Provided in Health Facilities: This form assessed the role of health facilities in promoting nutritional awareness in the community. It targeted health teams in PHC units.

- **Medical Examination & Lab Investigation Tools**

Students' medical examination: The medical examination was conducted at the schools of the target community through teams each consisting of a physician (internal medicine specialist), a nurse, a dentist, and a lab technician. The medical examination included: general medical history, general examination, anthropometric measurements (height, weight), dental examination, and lab investigations (HB, urine analysis, stool examination).

Sampling of target groups: Target groups from each school were the same students' grade 4 and grade 7 who were interviewed for KAP assessment.

Methodology: The physician performed standardized medical examination focusing on malnutrition manifestations. The dentist performed a standardized dental examination. For anthropometric measurements (height, weight), Maternal Child Health(MCH) scale was used; student bared foot, with removal of heavy clothes before weighting the student, and the height was measured by centimeters through

standard approach. As for the lab investigations: Hb was measured by Drabkin's method. Urine analyses, and stool examinations were performed in the schools by experienced HIO lab technicians. Vision is measured at 6 meters distance using standard eye chart (Snellen chart.).

## D. Key Findings

- I. Among rural primary and preparatory students in Minia:
  - Malnutrition problems are prevalent.
  - The most important malnutrition problems identified were:
    1. Anemia (about half of preparatory students and more than half of primary students).
    2. Stunting (reduction in stature below 3<sup>rd</sup> percentile by international measures): about a quarter for all subgroups, except preparatory female students, where stunting affects about one third. Stunting reflects the cumulative effects of long-term chronic malnutrition, not just transient changes (as it is the case with weight).
    3. Micronutrient and vitamin deficiency (indirectly assessed by clinical examination).
    4. Iodine deficiency (18.1% enlarged thyroid). Among 1<sup>st</sup> primary females, the percentage is 26.4%).
    5. Vitamin A and mineral deficiency (32.3% pityriasis alba cases).
    6. Multivitamin deficiency (especially vitamin B): 30.5% cheilitis.
  - Having at least one decayed tooth is the norm: 72.6%.
  - Bilharziasis has not yet completely disappeared: ova were found in urine in about 7% of students, and about 9% gave a history of current or past infection with bilharziasis.
  - Oxyuris (*Enterobius vermicularis*) infection is quite common. Ova were found in 35.6% of stool specimens. It is well known that Oxyuris ova do not often appear in stools. Therefore, it is thought that infection with this parasite is universal in this student population reflecting lack of personal hygiene.
  
- II. Most primary and preparatory students in rural Minia have breakfast before leaving home (about 80%), and 40% have sandwiches at school (whether home-made or otherwise). Meals are of relatively uniform composition across the community and highly monotonous for the same family. The main breakfast items are beans or falafel (bean cakes) with bread and tea and sometimes, milk, eggs, Keshk (wheat based milky pellets) or cheese are taken (reported by 16.4%, 5.9%, 5.0% and 3.7% of

students respectively). So the intake of those sources of animal portion is the exception rather than the rule. The main filling for sandwiches at school is again beans or falafel.

- The main items for lunch are cooked vegetables, rice, salad, potatoes, cheese, beans or falafel. About 20% reported having meat at lunch (implying an intake of about once per week on the average). Few reported intake of chickens (7.4%) and very few reported fish (3.2%). Consumption of bread at lunch is almost universal and drinking tea after lunch is a time-honored tradition (60.7%). Only about 10% have fruits for dessert after lunch.
- The main items for dinner are remarkably similar to those of lunch. Left-overs from lunch are frequently consumed again for dinner.
- The dietary pattern in general, is monotonous with little opportunities for variation. Intake of expensive items of animal source (meat, milk, eggs, etc.) is the exception rather than the rule, therefore these items are held in high esteem by the community, and this reflects on their nutritional perceptions. They often think that these items are useful for practically any health need and equate them with vitality and power.
- Nutritional Knowledge is grossly inadequate among surveyed students (as well as with most other population categories). The few items they know have been acquired mostly from popular culture or mass media and not through regular education.
- Nutritional Knowledge of primary care physicians and nurses was mostly correct, but not rich enough as expected from professional personnel. Despite intensive efforts of training and education on breast feeding, still more than 40% of physicians believe that fluids can be given alongside exclusive breast feeding and about one third are of the opinion that extra food has to be introduced from the fourth month onwards.
- Information gained from community members cross-validated that gained from other groups.
- Nutritional services at schools and primary care units are practically non-existing. Activities are either non-existing right from the beginning, or performed very occasionally in a non-systematic unenthusiastic mode.

## **E. Recommendations**

To face the significant problem of malnutrition among Minia children and adolescents, the following recommendations may be advanced on the basis of the study findings:

1. To adopt innovative approaches, traditional solutions have not worked and are not expected to work in the future. Approaches should emphasize community participation, self-reliance, multisectorality, integration and community development, not focusing on vertical isolated programs of little long-lasting impact.
2. To modify positively popular culture with regard to nutritional and health concepts, since it is the main source of information for most people, rather than regular systematic curricula. This can be done through mass media and direct community work.
3. Mass media messages have to be scrutinized scientifically, so as not to generate confusion, wrong beliefs or false rumors with a negative impact on community knowledge and practices. This is to be conferred to an autonomous impartial body, including representatives of the Ministry of Health and Population, Nutrition Institute, Agricultural Research Center, Universities and other experts.
4. Activating the role of non-governmental organizations (NGOs) and strengthening extracurricular activities at schools. The latter should be carried out by creative enthusiastic, well trained personnel, not by non-motivated poorly informed persons performing their roles in a reluctant bureaucratic way.

5. Treating parasitic infections conducive to malnutrition:
6. Modifying the crop composition so as to provide for more variety in diet.
7. Improving the economic status of households through income generation activities. Although, good dietary and nutritional knowledge would help in maximizing the nutritional value of cheap meals, this argument is not to be pushed to an extreme. A decent income is still needed for satisfactory nutrition.
8. The role of educational kitchens at primary care units should be strengthened. Their scope has to be broadened and not restricted to traditional topics. Sessions are to be conducted in an appealing way by competent demonstrators.
9. The school nutrition program has to be scientifically reviewed to ensure that it responds to actual student needs. Safeguards are to be put in place to guarantee that it is actually implemented as planned.
10. Reviewing the school curricular material with regard to nutrition information (cutting across most subjects, not only science or biology). Information should be concise, clear, scientifically valid and not internally contradictory. It should be presented in an appealing practical way.