بسم الله الرحمن الرحيم

University of Shendi

College of Post Graduate studies

Evaluation of the Application of Health Area System (HAS), in Shendi locality-River Nile State, Sudan. (Sep. 2007 – April, 2010)

A research Dissertation Submitted for **Ph.D** degree in Public Health

By: **Suleiman Elkamil Ahmed**

Supervisor: Prof.: **Abdel Ghaffar Ali Adam**

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(MB.Bs), M.D Community Medicine & Diploma International Health.

2010

قال تعالي في سورة العلق

بسم الله الرحمن الرحيم

"اقرأ باسم ربك الذي خلق (1) خلق الإنسان من علق (2) اقرأ وربك الأكرم (3) الذي علم بالقلم (4) علم الإنسان ما لم يعلم (5) "

صدق الله العظيم

Dedication

To my **parents**, brothers, sisters, **wife**, sons
, to all those from whom I was educated,
and to all those who is seeking knowledge.

Acknowledgments

I would like to express my deepest thanks to Prof. **Abdel Ghaffar** Ali Adam for his supervision and assistance to carry out this study.

I am grateful to the Faculty of Medicine and Health Sciences of Shendi University (**staff, workers and students**), for their assistance, especially in data collection and analysis.

Finally I would like to appreciate the cooperation of **Shendi community** without which the study could not have been completed.

Abstract

A descriptive cross-sectional community & facility - based study was carried out in Shendi locality-River Nile State, Sudan between September, 2007 – April, 2010.

718 of different classes from the community and health facilities of PHC in the locality were interviewed to evaluate the application of health area system, & estimate the coverage by the health services. The sample selected by using stratified sampling, then random simple sampling was used for each class. Structured questionnaires, focus groups discussion, and observation check lists, were used for this purpose to collect the data.

The study shows (8%) of the areas in the locality has no any type of health facilities. (77%) of the health facilities have regular supervision runs on the health services. No environmental health services in the PHC facilities. (73.4%) of the barriers which face the health area system is no enough supply by (money, manpower, and equipment) for the health facilities. Moreover, (31.6%) of the problems which faced the health workers are no continuous training. (27.3%) of the community participated in health programs. In addition, there is statistical significant relation between community participation in health programs and the age of the users of the health facilities.

Coordination between health sector and health related sector is good. Most of the community leaders define decentralization as delegation & distribution of responsibilities. There is no health council in the locality. Health team in the locality is existing, but without functions.

In conclusion, the current study shows that there are some areas in the locality with out health facilities and identified a number of shortages in health services. Health system has to establish health services on scientific way according to the community needs.

الملخّص: -

اجريت هذه الدراسة كمسح وصفي اجتماعي, (دراسة مقطعية), في الفترة من سبتمبر,
2007 الي ابريل,2010 بمحلية شندي, ولاية نهر النيل, السودان.

تمت مقابلة 718 من طبقات مختلفة من المجتمع والخدمات الصحية بالرعاية الصحية
الاولية, لتقييم تطبيق نظام المنطقة الصحية, ولمعرفة التغطية بخدمات الرعاية الصحية الاولية,
كما تهدف الدراسة لتحديد النقص والقصور بتلك الخدمات الصحية. حيث تم ذلك بواسطة اخذ
عينة طبقية من مجتمع الدراسة ومن ثم اخذ عينة من كل طبقة عن طريق العينة العشوائية
البسيطة. و استعملت الاستبيانات, المقابلات, الملاحظة, و مجموعات المناقشة, بغرض جمع
المعلومات المطلوبة للدراسة.

وجدت الدراسة (8%) من المناطقِ بالمحليةِ لا يوجدَ بها أيّ نوع من الخدمات الصحيةِ.
(77%) من الخدمات الصحية أجرى عليها إشراف منتظم. كما اظهرت الدراسة عن انعدام
خدمات صحة البيئة بمؤسسات الرعاية الصحية الاولية. (73.4%) من المعوقاتِ التي تُواجهُ
نظامَ المنطقة الصحيةَ، هي ان الخدمات الصحية لا تزود بالامداد الكافيَ. علاوة على ذلك,
(31.6%) منُ العاملين الصحيين يواجهون مشكلةِ عدم وجود تدريب مستمر. (27.3%) من
مجتمع محلية شندي شارك في واحد من البرامج الصحية. بالاضافة لوجود علاقة ذات اهمية
احصائية بين مشارك المجتمع في البرامج الصحية والعمر للمستفيدين من الخدمات الصحية.

من وجهة نظر مدراء ادارات القطاعات ذات الصلة بالصحة ان هناك تنسيق للانشطة
والبرامج الصحية مع قطاع الصحة. اما قادة المجتمع فمفهومهم عن اللامركزية انها تفويض
وتوزيع للمسئوليات والسلطات. لا يوجد مجلس صحة بالمحلية, و يوجد فريق صحي ولكن الان
لا يؤدى وظائفه.

خلصت الدراسةَ الحاليةَ بأنّ هناك بَعْض المناطق في المحليةِ لا توجدَ بَها خدمات صحيةُ, كما
حددتْ عدد مِنْ النَقْصِ والقصور في الخدمات الصحيةِ بمحلية شندي. وفي ختام الدراسة اوصت
الدراسة النظام الصحي أنْ يُؤسّسَ الخدمات الصحيةَ بمحلية شندي باستخدام الطرقِ العلميةِ
اعتمادا علي الدِراساتِ الحقيقيةِ طبقاً لحاجات المجتمع المحلي حتى يتم النهوض بصحته.

Abbreviations

HS: Health System

FMOH: Federal Ministry of Health

MOH: Ministry of Health

HAS: Health Area System

HA: Health Area

DHS: District Health System

PHC: Primary Health Care

HFA: Health for All

VHC: Village Health Committee

HCP: Healthy City Program

HCV: Healthy Village Program

CBI: Community Based Initiatives

BDN: Basic Development Needs

HAMT: Health Area Management Team

WHO: World Health Organization

NGOs: Non Governmental Organizations

Obs.: Obstetric

Gyn.: Gynecology

Ped.: Pediatric

Lab.: Laboratory

MCH: Mother & Child Health

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Chapter (1)

1.1 - Introduction

The aim of health system is health development and to achieve health for all, [2]. Decentralization in health system is needed to give more power to the local health system and to cover people by the health services. The majority of the literature define decentralization as being the process that transfers both authority and responsibility from the central government to subordinate governments, [3].

Sudan is the largest country in Africa, the large distance and continuous increasing in population need suitable means to develop and aware the community for promoting public health and improving the available health services. In addition, health system in Sudan needs decentralization to allow good coverage by primary health care.

Health in the developing world presented a gloomy picture of health, [5]. Sudan has many problems which were faced the health systems. To overcome the above obstacles, come sound of the primary health care system application. In addition a new strategy came, to covered people by the health services of PHC, and that strategy is health area system, which is defined as a health care system set up for delivering primary health care to a population within a well-defined geographical area.

Sudan participated in WHO general assembly in 1973, and committed the strategy of PHC program in 1976, [9], [3]. Sudan health ministry suggests starting the application of the district health system in Harare in august 1987, [10], to achieve the decentralization in the health system.

Shendi locality is one of the localities of the River Nile state, which was implemented the PHC strategy and adopted the health area system, [11].

1.2- Rationale:

The rationale of this study is, although Shendi locality was starting the application of the health area system for long time, no evaluation was done. Therefore, the present study is an effort to evaluate the application of health area system in Shendi locality.

1.3- Objectives of the Study

1.3.1- General objective:

The general objective of this study is to evaluate the application of health area system in Shendi locality-River Nile State.

1.3.2- Specific objectives:

- To estimate the community coverage by the primary health care.
- To investigate the managerial capacities of health area management team (HAMT), (supervision, monitoring, and training).
- To know the constitutional structures of HAS.
- To assess the community participation in the health development.
- To assess the coordination between health sector & health related sectors.
- To determine the shortages of health area system.

Chapter (2)

Literature Review

2.1- Decentralization in health systems:

It operates in the context of the socioeconomic and political framework of the counties, [5]. Health system constitutes the management sector and involves organizational matters, e.g., Planning, determining priorities, mobilizing and allocating resources, evaluating policies into services, evaluation and health education, [12]. Health system defined as "the combination of resources, organization, financing, and management that culminate in the delivery of health services to the population, [1]. Health systems in the world are different from country to country a cording to its culture, economic and social factors. All countries run after to improve their health system, [13].

The aim of health system is health development – a process of continuous and progressive improvement of the health status of a population currently, the goal of the of the health system is to achieve health for all, [14].

Health system to cover the community by the health services and health services to be accessible, health system decentralization have to be followed in providing health services and health programs. The majority of the literature defines decentralization as being the process that transfers both authority and responsibility from the central government to subordinate governments. It can be defined in general terms as a process of transfer of power, responsibilities and resources from the higher level of government to the lower level or levels, [3], [15]. In the public health sector, the World Health Organization has encouraged decentralization in its "global health for all strategy", [7], which stresses its importance as a tool for both inter-sectoral

collaboration and community participation. Fiscal decentralization strives to increase self-sufficiency of local governments as well as efficiency in the equitable access to the health services and delivery of services, [16].

The experience with decentralization in Sudan started with a district system in 1951 and went through many stages until it reached the federal system it has today, [3]. Sudan's experience with decentralization is a particularly interesting case to study for the reason that Sudan is a largest country in Africa and the tenth largest in the world and is both ethnically and religiously diversified, [17].

There are two aims of decentralization, first is to promote democracy, and second is to increase efficiency, [3]. Decentralization is expected to facilitate participation, to encourage innovation, to increase access, and to improve the effectiveness and efficiency of policy, [3], [16]. Decentralization changed the administrative structure, having a negative cumulative effect. The health did not manage to achieve its goals of improving accessibility to services, community participation, integration of vertical programmes and sustainable improvement of health, [18]. The main causes of this failure were the lack of financial resources and low political priority for health, [3].

2.1.1- Health policy:

Policies are general statements based on human aspirations. Set of values, commitments, assessment of current situation and an image of desired future situation, [19]. A national health policy is an expression of goals for improving the health situation, the priorities among these goals, and the main directions for attaining them, [20]. Health policy is often defined at the national level.

Each country will should to develop a health policy of its own aimed at defined goals, for improving the people's health, in the light of its own problems, particular circumstances, social and economic structures, and political and administrative mechanisms. Among the crucial factors affecting realization of these goals are: a political commitment, financial implications, administrative reforms, community participation and basic legislation, [2]. A recent landmark in the development of health policy was the world – wide adoption of the goal of HFA by 2000 AD. A future landmark was the Alma – Ata Declaration (1978), [8], calling an all governments to develop and implement primary health care strategies to attain the larges of HFA by 2000 AD.

2.1.2- Health services:

The objective of health services is preserving and improving to live and enjoy health of the people their life without problems.

It was recognized that in both developed and developing countries, the standard of health services the public expected was not being provided, [21]. The services do not cover the whole population. There is lack of services in some areas and unnecessary duplication in other. A very high proportion of the population in many developing countries, and especially in rural areas does not have ready access to health services. There are marked differences in health status between people in different countries as well as between different groups in the same country; the cost of health care is rising without much improvement in their quality. In short, there has been a growing dissatisfaction with the existing health services and a clear demand for better health care, [5], [22].

2.1.3- Coverage:

Coverage may be defined as the percentage of people within a population who need and receive a particular service out of all those who need that service. This is measured over a specified period of time – usually one year. Estimation of the numbers of people needing a service will depend upon morbidity and demographic data, [22].

A service is utilized when patients perceive that they need it and then demand it. However, utilization may also reflect demand in the absence of need; for example, people sometimes wish to have an X-ray because they believe it confers therapeutic benefit, [22].

Physical accessibility is the time required to travel to a service, e.g. a clinic. Obviously it depends on its topographical situation (e.g. on a hilltop or in the plains), and its position within the network of roads or other lines of communication. Its situation relative to the distribution and density of the population is also important. Work in Africa has suggested that a 10 mile radius from a hospital covers the distance which people will usually walk; a 20 mile radius takes account of public and private transport and the walking distance of nomadic people; and a 30 mile radius defines the maximum area from which people will come except under special circumstances, [22].

Although people have to pay for health care, services may become economically inaccessible to the poor. An indication of whether this is occurring may be obtained by questioning users of the service about their occupational and economic circumstances. It may, however, prove difficult to obtain reliable information about the payments actually being made for a service, or quantify poverty within the community, [22].

Reasons for the lack of coverage of a service may be readily apparent to the outside observer , for example obvious causes of physical inaccessibility or become apparent as a result of informal conversation with local people, community leaders or traditional healers sometimes it may be helpful to carry out a questionnaire survey on a sample of the population not receiving adequate coverage, [22].

2.1.4- History of the health system in Sudan:

The evolution of the modern health care system in Sudan goes back to 1899, when it was being delivered by the army [23]. Some hospitals were built and smallpox immunization programs were run. The Medical Department was established in the Northern Sudan in 1904, where the Southern areas remained under military government. In 1905 the Central Sanitary Board was established to guard the public and curative health affairs. In 1924 the Sudan Medical Services was established and managed by a director responsible for all health services, including military medical services. In 1949 the Ministry of Health was established. Between 1951 and 1960, the health was managed according to the Local Government Act 1951, where the rural and civil councils represented the local government responsible for basic service delivery, including health. From 1960 to 1971, the health was managed according to the Province Administration Act 1960, which aimed at strengthening the provinces to activate an effective mid-level administration that represents the central government. At that time the health was represented by the governor assistant for health affairs. The province was responsible for supervising, promoting and financing the local authorities. This was followed by the Popular Local Governance Rule in 1971, which was also an effective administrative/political level where the province remained responsible for the basic services (education, public

health, agriculture and community development), the provinces were under the local government affairs office under the Presidency of the Republic. In 1979, seven central ministries were cancelled and the authorities of four ministries, including the ministry of health, were reduced and given to the provincial authorities. In 1980, The Local Government Act divided Northern Sudan, excluding Khartoum, into five regions, and Southern Sudan into three regions. The adoption of the federal system started in 1991. The regions were upgraded into nine States that further became 26 in 1994. A single ministry for health and social affairs was found in each of the states while separate ministries for health and social affairs were found in Khartoum. The locality remained as an effective administrative level with its own resources and responsible for basic services including health, [24].

In the late 1970s and early 1980s in Sudan, the government undertook programs to deal with specific diseases in limited areas, with help from the World Health Organization and other sources. It also initiated more general approaches to the problems of health maintenance in rural areas, particularly in the south. These efforts began against a background of inadequate and unequal distribution of medical personnel and facilities, and events of the late 1980s and early 1990s caused an almost complete breakdown in health care. In 1982 there were nearly 2,200 physicians in Sudan, or roughly one for each 8,870 persons. Most physicians were concentrated in urban areas in the north, as were the major hospitals, including those specializing in the treatment of tuberculosis, eye disorders, and mental illness. In 1981 there were 60 physicians in the south for a population of roughly 5 million or 1 for approximately 83,000 persons. In 1976 there were 2,500 medical assistants, the crucial participants in a system that could not assume the availability of

an adequate number of physicians in the foreseeable future. After three years of training and three to four years of supervised hospital experience, medical assistants were expected to be able to diagnose common endemic diseases and to provide simple treatments and vaccinations. There were roughly 12,800 nurses in 1982 and about 7,000 midwives, trained and working chiefly in the north, [10], [36].

2.1.5- Institution of health training:

Training for nurses and health worker begin since before Sudan has its own authority. In Port Sudan medical assistants school established in 1918, midwives school in1821 in Omdourman and training health schools began to establish to train the health workers with their different specializes. The objective of the health ministry institutions is training and rehabilitation the health workers, [25]. 1980 plan of immunization programme was put, and also endemic disease control, (S. & M.). 1983 training for diarrhea control programme was begun. 1986 respiratory infection control programme & t. b. programme in east were started. Support to nutrition management was done. 2000 leprosy programme & new born tetanus were started.

2.2- Primary Health Care (PHC):

2.2.1- Introduction:

Health has been declared a fundamental human right. This implies that the state has a responsibility for the health of these peoples. National governments all over the world are striving to expand and improve their health care services are that they are predominantly urban – oriented, mostly curative in nature, and accessible mainly to a small part of the population. The present concern in both developed and developing countries is not only to reach the whole population with adequate health care services , but also to secure an acceptable level of health for All by the year 2000 , through the application of primary health care programmers .

Anew approach to health care came into existence in 1978, fallowing an international conference at Alma _ Ata (USSR). This is known as (primary health care. It has all the hallmarks of primary health care delivery, first proposed by the Bhore Committee in 1946 and now espoused world – wide by international agencies and national governments, [26].

2.2.2- Evolution of PHC:

Many studies on health system in the different countries in1973 by WHO committees, reflect bad picture of the health services provided to the people, [10]. This picture may be result of, increasing cost of the health services, without improving in the community health. High medical technology used without studies. Health services failed to achieve their objectives. People have no responsible toward their health. No community participation. No equal distribution for the resources and health services in the different area in the countries. There is increasing in the prevalence rate

of the disease. Morbidity rate and mortality rate both were high. So PHC came as a solution to that an accepted situation, [27].

The health problems in the world are several, associated with each other and their causes are share between many of them. So the public society of WHO think that the strategy which follow to face that health problems one to another was not stable and it is better to create comprehensive strategy to face the present health situation and leave positive effect, [13].

All the member countries of WHO, done health and social survey, and its importance results were:-

- There is differential in the health measurements between developing and developed countries.
- No justice in the distribution of the health services between rural and urban.
- No justice in resources distribution between the curative and preventive health services.
- Increase in infant mortality rates.
- Increase in diseases associated with water and environmental health.
- Decrease in the health aware ness of the people.
- Decrease in the mother and child health services.
- Increase in prevalence of child hood diseases, which can avoid by vaccination.
- No community participation in planning and implementation of the health services.
- Weak coordination between the health sector and related health sectors.

After specialize committees and work groups, studied the above results and put the PHC strategy, and discussed and accepted by the public assembly of WHO in 1973, [28], [13].

2.2.3- Definition of (PHC):

Primary Health Care (PHC) is defined as essential health care based on practical, scientifically sound, and socially acceptable methods and technology made accessible to individuals and families in the community through their full Participation and at a cost that the community and country can afford to maintain in the spirit of self-reliance and self-determination, [8].

2.2.4- The objective PHC:-

The main and essential objective of PHC is to serve people health needs and to achieve health for people, [13].

2.2.5- Elements of P.H.C:-

Although specific services provided will vary in different countries and communities, the Alma – Ata Declaration has out tined 8 essential components of primary health care, [8].

1- Education concerning prevailing health problems and the methods of preventing and controlling them.

2- Promotion of food supply and proper nutrition.

3- An adequate supple of safe water and basic sanitation.

4- Maternal and child health care, including family planning.

5- Immunization against major infections diseases.

6- Prevention and central of locally endemic diseases.

7- Appropriate treatment of common diseases and injuries.

8- Provision of essential drugs, [10].

2.2.6- Principle of P.H.C.:

2.2.6.1- Coverage by health services (Equitable distribution):

The first key principle in the primary health care strategy is equity or equitable distribution of health services. Health services must be shared equally by all people irrespective of their ability to pay, and all (rich or poor, urban) must have access to health services. This has been termed as social justice. The failure to reach the majority of the people is usually due to inaccessibility, [5].

2.2.6.2- Community Participation:

Community is a group of people sharing common values, interests or identity, which distinguishes them from other communities, [29]. In addition to the health sector, families and communities need to get actively involved in taking care of their own health. Communities should participate in the following:

- □creating and preserving a healthy environment

- □maintaining preventive and promotive health activities

- □sharing information about their needs and wants with higher authorities

- □implementing health care priorities and managing clinics and hospitals, [30].

However, the overall responsibility of the central and state Governments, the involvement of individuals, families and communities in promotion of their own health and welfare, is an essential ingredient of primary health care. Countries are now conscious of the fact that universal coverage by primary health care can't be achieved without the involvement

of the local community. There must be continuing effort to secure meaningful involvement of the community in the planning. Implementation and maintenance of health services, besides maxim reliance local resources such as manpower, money and materials. In short primary health care must be built on the principle of community participation (or involvement), [27]. The promotion of primary health care, health education, immunization and environmental improvement cannot be successful unless the community participates, [22].

2.2.6.3- Intersectoral coordination:-

There is an increasing realization of the fact that the components of primary health care can't be provided by the health sector alone, The declaration of Alma – Ata states that primary health care involves in addition to health sector , all related sectors and aspects of national and community development , food , industry , education , housing , public works , communication and others, [8].To achieve such cooperation , countries may have to review their administrative system , reallocate their rescores and introduce suitable legislation ensure that coordination can take place . This requires strong political will to translate values into action. An important element of intersectoral approach is planning – planning with other sectors to avoid unnecessary duplication of activities.

2.2.6.4- Appropriate technology:

Appropriate technology has been defined as (technology that is scientifically sound , adaptable to local needs , and acceptable to those who apply it and those for whom it used , and can be maintained by the people them selves in keeping with the principle of self reliance with the resources the community and county can afford, [31].

2.2.6.5- Health promotion:

Health promotion is "the process of enabling people to increase control over and to improve health", [32]. It is not directed against any particular diseases, but is intended to strengthen the host through a variety of approaches (intervention). The well-know interventions in this area are:

I – health education

ii- environmental modifications

iii- nutritional interventions

iv- lifestyle and behavioral changes .

Since health promotion comprises a broad spectrum of activities, a well-conceived health promotion programme would first attempt to identify the "target groups " or at – risk individuals in a population and then direct more appropriate message to them, [33]. Goals must be explored. It involves "organizational, political, social and economic interventions designed to facilitate environmental and behavioral adaptations that will improve or protect health", [19].

2.2.7- Health for All:

In 1977, it was decided in the world Heath Assembly to launch a movement Known as (Health for All by the year 2000). The fundamental principle of HFA strategy is equity, that is, an equal health status for people and countries, ensured by an equitable distribution of health resources. The member countries of WHO at the 30th world Health Assembly defined Health for all as (attainment of a level of Health that will enable every individual to lead a socially and economically productive life, [8], [10].

The WHO has established 12 global indicators, [20], as the basic point of reference for assessing the progress towards HFA , as for example , a minimum life expect any of 60 years and maximum (MR of 50 per 1000 live births .

2.2.8- Alm- Ata Declaration:

Adopted by the International Conference on Primary Health Care, Alma Ata, the Kazakh Soviet Socialist Republic (now Kazakhstan). 6-12 September 1978. Different sectors, (health, education, agriculture, financial and others), in different countries represented at that conference. The main objective of that conference was political commitment of the governmental to achieve health for all by 2000. Alma-Ata conference recommended & committed health for all by 200, and 22 recommendations named Alma-Ata declaration, [10].

Before Alma _Ata , primary health care was regarded as synonymous with (basic health services) , (first contact care) ,(easily accessible care) , (services provided by generalists). The Alma – Ata international conference gave primary health care a wider meaning, [8].

The Alma-Ala conference called on all governments to formulate national policies, strategies and plans of action launch and sustain primary health care as part of a national health system. It is left to each country to develop its norms and indicators for providing primary health care according to its own circumstances.

2.2.9- Health team concept:

It is recognized that the physician of today is over worked professionally. It is also recognized that many of the functions of the physician can be performed by auxiliaries, given suitable training. An auxiliary worker has been defined as one (Who has than full professional qualifications in a particular field and is supervised by a professional worker). The WHO no longer use the term (paramedical) for the various health professions allied with medicine, [19].

The practice of modern medicine has become a joint effort of many groups of workers, both medical and non – medical. viz, physicians , nurses , social workers , health assistant , trained dais , village health guides and a hast of others . The composition of the team varies. The hospital team is different from the team that works in the community. Whether it is a hospital team or community health work team, it is important for each team member to have a specific and recognized function in the team and to have freedom to exercise his or her particular skills. In this context , a health team has been defined as (a group of persons who share a common health goal and common objectives , determined by community needs and toward the achievement of which each member of the team contributes in accordance with her / his competence and skills , and respecting the functions of the other), [34]. The health concept has taken a firm root in the delivery of health services both in the developed and developing countries. The health team approach aim to produce the right mix of health personnel for providing full health coverage of the entire population, [35].

2.2.10- PHC in Sudan:

Sudan participated in WHO general assembly in 1973, and committed the strategy of PHC program in 1976, two years before the Alma Ata declaration of 1978, [3], [8], [9]. It established two national committees to plan the PHC program in the Southern and the Northern region. The adoption of PHC initiated important changes in the health system. People were encouraged to build PHC units and other health services according to their own ability and not according to a plan of MOH or the local health authority, [9]. Sudan health ministry analysis the health situation in 1974, with related ministries participation. The main health problems found according to the priorities were Malaria, less health services in rural, bad environmental health, malnutrition, less MCH, communicable disease, no health education, schistosomiasis and tuberculosis.

Sudan start to give health services, (dispensaries, health centre and rural hospital), in rural to be near people, and established basic health unit. Many training centres to train health workers (health supporters, midwives and health visitors), were began, [10].

In the mid-1970s, the Ministry of Health in Sudan began a national program to provide primary health care with emphasis on preventive medicine. The south was expected to be the initial beneficiary of the program, given the dearth of health personnel and facilities there, but other areas were not to be ignored. The basic component in the system was the primary health care center staffed by community health workers and expected to serve about 4,000 persons. Community health care workers received six months of formal training followed by three months of practical work at an existing center, after which they were assigned to a new center.

Refresher courses were also planned. The workers were to provide health care information and certain medicines and would refer cases they could not deal with to dispensaries and hospitals. In principle, there would be one dispensary for every 24,000 persons. Of the forty primary health care centers and dispensaries to be completed by 1984, about half were in place by 1981. In addition, local (district) hospitals were to be improved, [36].

2.3- The health area system:

2.3.1- Evolution of district health system:

Although Sudan was followed the application of the strategy of PHC, many advantages & disadvantages appeared in the system of PHC. The advantages are concentration policies and efforts on priority issues like health services, health services reach big number of people, health training programmes for health workers began, PHC philosophy accepted by managers, many national health programmes in PHC begin and attempted to development of community participation. The disadvantages are: no coordination between health programmes, & related sectors, local planning, community participation, supervision & monitoring, training, communication and weakness of management system, [10].

Sudan health ministry to avoid the above disadvantages suggests following the application of the health area system to achieve the decentralization in the health system, after WHO supporting. This strategy adopted in Harare the capital of Zimbabwe in august 1987, [10]. Harare declaration contains:

- PHC strengths by comprehensive efforts depend on district health system.

- The importance of cooperation between the different sectors and the community, to strengths the local management. And this required:

- (Supporting polices, decentralization, promoting the health planning, strengths community participation to depend on its self, strengths cooperation between the different sectors and encourage health researches), [10], [13].

Ministry of Health (MOH) is responsible for running the health services for the entire nation is known as a centralized health system. Primary health care is best implemented in a decentralized system, which transfers the authority and responsibility of planning, managing resources and/or decision-making from the central MOH to the district and local levels.

Transferring management functions closer to the local health authorities gives the local communities a louder voice in determining how clinics and hospitals can improve the quality of health care being provided, [36].

2.3.2- Defining of the health area system:

A district health system (DHS) is based on primary health care. It serves a well-defined population living within a clearly delineated administrative and geographical area. It includes all relevant health care agencies in an area (government, private, professional or traditional) which co-operate to create a district system and work together within it. Expected benefits of a well-functioning district health system include:

- □a rational and unified health system that meets the basic health needs

-□flexible management of health services, with minimum logistical and administrative delays

- □more equitable health services to the entire population

- □improved management of resources

- □co-ordination and integration of health care with activities of other sectors

- □a means for facilitating community participation and accountability to the community

- ☐better performance through an efficient and motivated workforce Because health centers are often the first contact the community has with the formal health system and most of the district level health workers are based there, health centers should be equipped to function as the focal point for comprehensive PHC. Resources should be readily available at this level to maintain adequate and stable levels of staffing and supplies, [36].

In addition, we can define the health area as a geographical area, limited by the local administration and serve the local population and include all the levels of the local health from the public, private or voluntary sector. Health area serves 100.000 – 500.000 person, [10], [13].

2.3.3- Objectives of health area system:

The health area system aims to:

- coordination & cooperation of health services

- developing the skills of the health workers with training and supervision

- health services must be accessible to the people

- increasing the people usage of the health services

- strengths supervision and monitoring for the health services and health workers

- promoting the skill of planning and management of the health system

- encourage the community participation in the PHC programmes

- create coordination between health sector and others related sectors

- promoting the health information system and create local resources to support the health system, [10], [13].

2.3.4- Health area missions:

Health area provides comprehensive health services, which include-

- Health support and promotion:

(Reproductive Health, school health, monitoring growth and any other promative services.

- Prevention and control of diseases:

This includes children and pregnant women vaccination against diseases.

- Diseases diagnosis and treatment in the area.

- Rehabilitation. "community medical R" community rehabilitation includes encouraging community participation , enable community to usage the health services leaders development , strength the coordination likes between the different associated sectors , reactive health system information , training and improve the health workers supervision for planning and evaluation of the health services in the are and supply the health activities by the local resources , [13].

2.3.5- Support and supervision to the health services:

We mean by support to give a suitable environment to achieve the work, to give the enough materials and equipments to achieve the work and give help full orientation and instructions to achieve the work.

Visiting the work place by the leaders and supervisors of the worker has a big effect to establish good relation ship between the leaders and the workers. Moreover, it is kind of support create confidence and increase the abilities of the workers.

Supervision associate with support. Supervision means the process of detection of the errors in the work and modifying that errors to achieve the work in a right way, [13], [22].

2.3.6- Health areas system in Sudan:

Sudan applied health area system to achieve decentralization for the health system, by:-

- Classification Sudan to geographical health areas.
- Health area managed by one Mahalya.
- Any health area has health team from the different health specializations. In addition, the health team has to be the link between the health ministry and the local community. Health team has to plan, implement and evaluate the local health services, [13].

2.3.7- Levels of health area system:

Health area system has three health management levels in Sudan; any health management level has its own role.

2.3.7.1- Federal role:

Policies formulation, strategic Planning, training, international relationship, supervision, monitoring and evaluation, [10], [25].

2.3.7.2- State role:

Planning, (planning according to the state level and put the legislation).

Implementation, (application (HAS) in the state, training the health teams and health workers.

Evaluation, supervision and monitoring, [10], [25].

2.3.7.3- Local role:

Planning, (put plan according to the local level and put local laws).

Implementation, (health team implements plans, and training health workers.

Evaluation, supervision and monitoring, [10], [13], [25].

2.3.8- Level of Health care:

Health services are usually organized at three levels, each level supported by a higher level to which the patient is referred. These levels are:

-primary health care: This is the first levels of contact between the individual and the heath system where (essential) health care (PHC) is provided.

-secondary health care: At this is level, mare complex problems are dealt with. This care comprises essentially curative services and is provided by the district hospitals and community health centers. This level serves as the first referral level in the health system.

-Tertiary health care: This level offers supper – specialist care, this care is provided by the regional central level institutions. These institutions provide not only highly specialized care, but also planning and managerial shills and teaching her specialized staff, [5], [13].

2.3.9- The administrative structure of health area system:

2.3.9.1- Health team:

Health team is a team from different health fields, and it contains:-

- Doctor as a team leader, health officer, dispensaries inspector. Pharmacist or assistance pharmacist, health visitor, diarrhea and respiratory system coordinator, vaccination officer, nutrition officer and statistician, [13].

2.3.9.2- Health council:

Health council consists of community members and health associated sectors.

The health council discuss the health team plans to improve the health services in the area and catch the political support, [13].

2.3.9.3- Village health committees (VHC):

The village health committees consist of community members, health workers, and voluntaries, [13].

2.3.10- Rural health area:

2.3.10.1- Basic health unit:

Basic health unit it is the first contact point between the community and the health services. This unit provides services to support and promote health, prevention and control of diseases, diagnosis and treatment of diseases in the area and medical rehabilitation. The basic health unit serve 5000 person in geographical area its distance 5 Km or 1/2 hour walking. The basic health unit consists of medical assistant room, multistory room (vaccination and mother and child health), waiting room and small room for nursing care. There must be latrine and source of drinking water, [13].

2.3.10.2- Dispensary:

Dispensaries are usually located in larger villages; their catchments population ranges from 5ooo to 10000. An experienced medical assistant, village midwifes and 1-2 nurses usually staff them. Lager dispensaries have inpatient facilities for up to 10 patients. Dispensaries are considered as the first line referral level for the PHC units, [3].

2.3.10.3- Rural health centre:

This health center severs 20.000 people of the population. Therefore, it must be in easy place for reaching. The health services which provided by the rural health centre they include all services provided by the basic health unit and, diagnosis and treatment of diseases, small surgical operation, first aids, quick recitation services, dental services, refer to rural hospital or urban hospital and basic laboratory services, [13].

Rural health centre works tow shifts in the day. The man power work

in it includes, one medical house officer, 2 medical assistants, pharmacist, 3 nurses, medical laboratory assistant, statistic technician assistant, sanitary overseer, health visitor, nutrition educator, vaccination technician and 7 health workers. The building and services in the rural health centre are 2 rooms for investigation, health promotion room, waiting room for patients, laboratory room, health visitor room, pharmacy room, small operation room, injection room, resuscitation room and source of drinking water, [13].

2.3.10.4- Rural hospital:

The rural hospital sever 100.000 -250.000 persons, with 40 beds. Services provided by the rural hospital is promotive, preventive, curative, rehabilitative and other management work.

2.3.10.4.1- Promotion services:

Health education, school health, nutrition education, reproductive services health workers training and medical and health students.

2.3.10.4.2- Preventive services:

Vaccination, early detection and notification for diseases, epidemiology investigation, central of epidemic disease, and diarrhea control.

Control and treatment of epidemic and endemic disease:

- Tuberculosis, malaria, schistosomiasis, leishmeniasis, leprosy, diarrhea and aids, [13].

2.3.10.4.3- Curative services:

Investigation, diagnosis and treatment to the patients, provide addition diagnosis services, laboratory, x ray, surgical operation, obstetric and gynecology operation, receive the referred cases, referred to the upper level, and diagnosis and treatment eyes diseases and dental disease.

2.3.10.4.4- Rehabilitative services:-

Cases follow up and social and psychology rehabilitation.

The rural hospital provides also forensic services, [13].

2.3.10.4.5- Medical and health emergency:

This unit provides help in emergency and medial accident.

2.3.10.4.6- Building and services:

Suitable building and enough equipment and furniture.

2.3.10.4.7- Health manpower:

One medical officer, 3 medical house officers, dentist, 3 medical assistants, ophthalmologist medical assistant, 3 operation preparers , 3 anesthesia assistants, 4 laboratory technicians, 3 (x ray) technicians, health visitor, 3 midwives, nutrition officer , 3 nutrition educators, natural treatment medical assistant, social researchers, sanitary overseer, storage keeper, pharmacist medical assistant, boss of nursing , 30 nursing, manager, writer, 3 statistic technicians , 2 electric technicians, 2 washers , 2 cookers , 19 workers, section room worker, driver, 3 keepers and garden worker, [13]. The rural hospital work for 24 hours, and contains 40 beds, [13].

2.3.10.5- Urban health area:

2.3.10.5.1- Urban health centre:

This health center serve 50.000 persons, and it is the first health services contact point in the urban area and receive the referred person from the rural health centre. Health services provided by urban health center are all the health services provided by the rural health center in addition to, Labor services, dental care, ophthalmology services and diagnostic services, x ray and laboratory.

2.3.10.5.1.1- The building:

Enough buildings, which have health conditions in them.

2.3.10.5.1.2- Health manpower:

Urban health centre work three periods at the day. Medical house officer, 3 house officers, dentist, ophthalmologist medical assistant , 3 pharmacists medical assistant, technicians for the laboratory, 3 medical assistants, 2 midwives , vaccination technicians , 3 statistic technicians, 12 nursing and 10 health workers, [13].

2.3.10.5.2- Urban general hospital:

It considers the secondary care level, and contains medical specialist surgery, medicine, obs., and gyn. Ped., dentist and opticalist. This hospital serves 500.000 persons, and contains 200-250 beds. The services provided by urban hospital are all the services provided by the rural hospital, in addition to general and specialization services (investigation and treatment in the external clinic and in the words), receive the referred cases, referred cases to the upper level, provide medical and healthy emergency services,

forensic services, specialization medical services in the low level around the urban hospital, continuous training for the health workers, provides diagnostic services assistant x ray, laboratory and ultra sound, and diagnosis and treatment of teeth and eyes diseases, [13].

2.3.11- Application of health area system in Shendi locality:

Shendi locality is locality in north of the capital of Sudan (Khartoum) and in south of Eldammer, at River Nile state. The administrative structure of the health system in the locality consists of the FMOH, state MOH, health affairs in the locality, medical manager, health inspector, dispensaries inspector, medical house officers, health officers and assistants health workers as in the following figure, [45], [44].

The administrative structure of the health system in the locality:

```
                        ┌─────────────┐
                        │    FMOH     │
                        └─────────────┘

                    ┌───────────────────┐
                    │     State MOH     │
                    └───────────────────┘
                              │
                              ▼
              ┌─────────────────────────────────┐
              │  Health affairs in the locality │
              └─────────────────────────────────┘
              ↙               │               ↘
      ┌───────────────┬───────────────┬─────────────────────┐
      │Medical manager│Health inspector│Dispensaries inspector│
      └───────────────┴───────────────┴─────────────────────┘
            │               │                    │
            ▼               ▼                    ▼
      ┌───────────────┬───────────────┬─────────────────────┐
      │    Doctors    │Health officers│  Assistants health  │
      └───────────────┴───────────────┴─────────────────────┘
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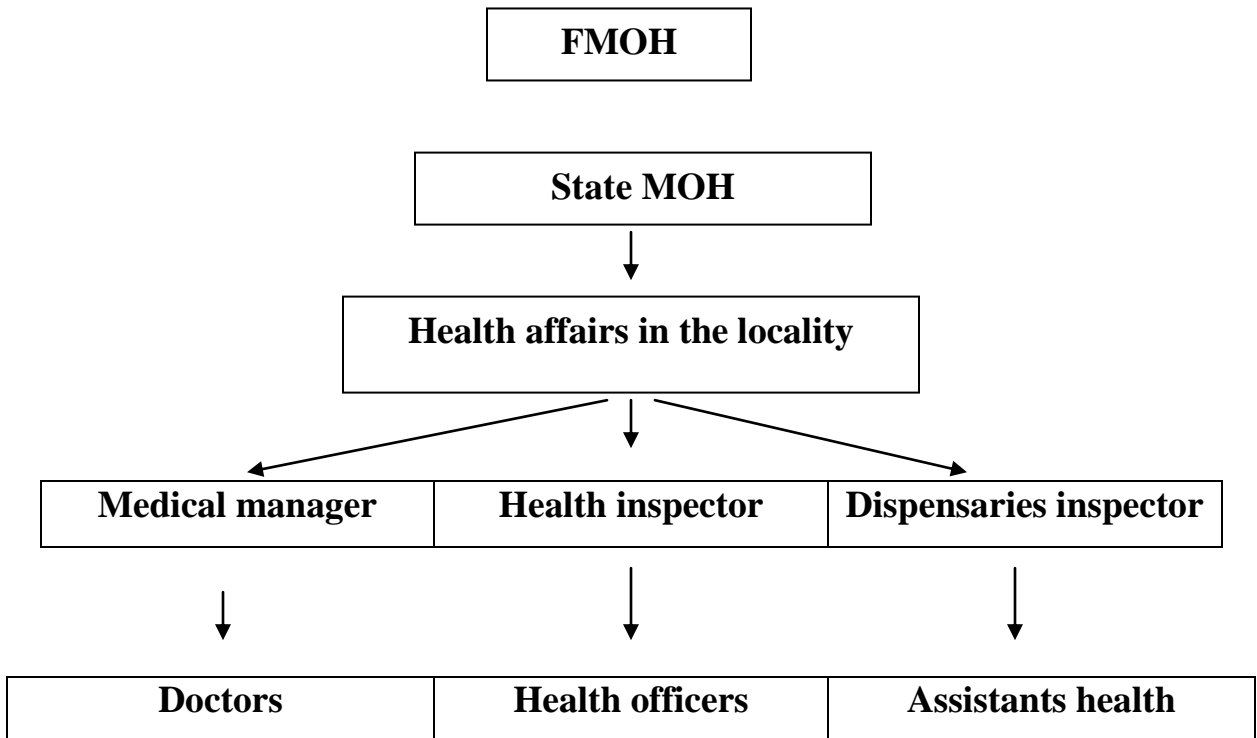
		workers

FMOH & state MOH provide the health team by technical support. The legislation council (locality) provides the health team by supply of money and political support, [46], [45].

In the 1990ˢ Shendi locality applied the HAS. Health areas were established around the rural hospitals and health centres. However, the rural hospitals did not play active role in the health areas because of the replacing of the doctors. Therefore, the health centres played the main role in the application of the health areas. Later on expanded immunization program for children and MCH program were included in the HAS, [46], [44], [45].

2.3.11.1- The administrative structure of the health areas:

Actually, no health council in the locality, but the committee of the services was dealing with the work of the health council.

Health area system was established health team in the locality to deal with the work of the health directly, it was consisted of health affairs manager, the medical manager of Shendi teaching hospital, health inspector, dispensaries inspector, health visitor, statistic manager and others health workers. The health team was trained in Shendi university three times for different levels, Atbara, Khartoum, Algazeera university and by Bamaco. The reproductive health, Development college and Shendi healthy city project play also active role in training and improving the skills capacities of the women and the people and identified the needs of the community, [46], [44], [45].

Moreover, this health team established many sub-health teams as village health committees (VHC) in the villages of the locality and trained

them. In each village, the health worker is the leader of the health team, [44], [45]. Now the health team is not active or without activities.

2.3.11.2- The model of the administrative structure of the health area in Shendi locality, [44]:

```
┌─────────────────┐
│  Committee of   │
│  the services   │
└─────────────────┘
         │
         ↓
┌─────────────────┐
│   Health team   │
└─────────────────┘
         │
         ↓
┌──────────────────────────┐
│ Village health committee │
└──────────────────────────┘
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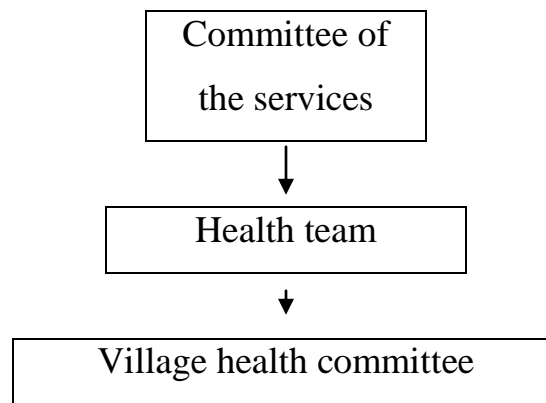
2.3.10.3- Some activities that were implemented by the health team:

- Planning
- Training
- Activation of the information system & notification system
- Activation of the community participation
- Regular field visiting & supervision
- Regular meetings
- Work as a team and group
- Unification of the budget
- Insecticide campaigns, [45], [46].

2.3.11.4- The barriers that were faced the application of the HAS:

- Poor supply

- No clear boundaries of the localities (local government law)

- Rural hospitals restricted their role in curative services

- Replacing of the members of the health team

- Some of the members of the health team used to have pension

- Lack of the transportation for the health team, [46], [44], [45].

2.4- Previous studies in health area system in Sudan:

2.4.1- Study (1):

This study discusses primary health services in Blue Nile State concentrating on development of health facilities, their characteristics and pattern of distribution. The objective is to measure the development of health services in relation to population distribution as well as determining the distances covered by he beneficiaries from their homes to the health facilities. The study has also explored the degree of satisfaction or otherwise with the health facilities expressed by those using the health services. The discussion of the research problem, objectives and hypotheses resulted in the following findings:

- The study has revealed considerable variations in the size of health centres concerning buildings, medical staff and equipment.

- The study has shown lack of maintenance of buildings, medical equipments and shortage of medial and supporting staff, thereby resulting in lower standards of medical services.

- The study sample has indicted a low income for most of the population indicating that the majority are unable to pay for their health bills which are being subsidized by the authorities, and as such do not benefit from available health services.

- The study has revealed that the existing population size and high rate of population increase in the study area is incompatible with the number of health centres.

- The research has proved that about 60% of the residual quarters in the study area are devoid of health facilities in spite of population densities.

- The study has shown considerable variations both in time and distances to be covered by patients to reach their health centres in the neighborhoods.

- The study has revealed that the distribution of health services follows a cluster pattern closer to the random pattern making health facilities far away from most users indicating locational problems contrary to good planning, [37].

2.4.2- Study (2):

The second study investigates health service in the Red Sea State, case study of Port Sudan. The main objectives of the study are; to investigate the quantity of the health service in relation to population of the study area, to illustrate the special distribution of the health centers, and to measure degree of satisfaction of population. The main findings of the study can be summarized in the following:

- There is only one Doctor for 30 persons and one bed for 177 persons in the study area. This indicates the high pressure on the health services.

- The study explores the factors affecting the satisfaction of the population, including distance and time spent to obtain the service.

The candidate suggests the following recommendations: The study area is in urgent lack to adequate health services. There fore it needs 5 hospitals and 16 medical services and they should be distributed proportionally to the population density. The study area is in lack to adequate medical personal to reduce the pressure on the service. Good quality of service, and healthy environment are very essential, there fore, hygiene, collection of medical and domestic wastes must be given prior

attention. Improvement of medical services must put into consideration, in terms of rehabilitation of buildings, good medical facilities, modern equipments to obtain satisfactory services for population, [38].

2.4.3- Study (3):

The third study done by Mohammed Ali Yehya Elabassi, about public health sector reform: the implementation of federal decentralization in Sudan and its impact upon the sector of public health, in 2003. The aim of the study is to study decentralization in the public health sector for the first time in the country.

Decentralization has been used by different people to indicate different things. However, its common theme indicates a transfer of decision-making responsibility, resources and functions from the centre to the bodies outside the centre. The two major aims of decentralization are to promote democracy and increase efficiency.

The health area program (HAP) was intended to create decentralized local health units (health area) that operated on the principles of PHC, the integration of health services, and the direct accountability to selected local councils acting as representatives of the population. The HAP failed to meet its expectations. The HAP failed to be established in the local councils and improvements in both quality and integration of health care services did not materialize. The local councils did not take the ownership of the HAP, [3].

2.4.4- Study (4):

This study is a descriptive-baseline study to identify different indicators in four health area in Sudan, Elsoki, Elzaidab, Tawaiet, and Milleet. It was conducted through household surveys, health facility surveys and interviews. The sample size is 10% of the estimated number of

households in each area through a cluster random sampling. Sample from different health facilities was selected in each area in addition to the head quarter of the area.

The data was processed and analyzed and five categories of indicators were obtained. There are:

1- Health policy indicators

2- Demographic and socioeconomic indicators

3- Services utilization indicators

4- Services and input indicators

5- Impact and health indicators

The results show poor implementation of the health area policy. So indicators are toward services and health inputs are different. Available services are utilized. The overall health status is still poor as shown by the high prevalence of endemic and child disease, high mortality and low impact of some services.

Health area needs enforcement at different levels. It needs commitment and budgets. Community and all sectors should be actively involved. A lot of effort should be directed towards establishment of services with provision of sources. Comprehensive development should be going together with health development in order to promote health and life style, (47).

2.5- Study in district health system in some countries:

2.5.1- Costs and revenue of health care in a rural Zimbabwean district:

The District Health Executive of Tsholotsho district in south-west Zimbabwe conducted a health care cost study for financial year 1997–98. The study's main purpose was to generate data on the cost of health care of a relatively high standard, in a context of decentralization of health services and increasing importance of local cost-recovery arrangements.

About 60% of the costs were for the district hospital, while the different first-line health care facilities (health centres and rural hospitals together) absorbed 40%. Some 54% of total costs for the district were for salaries, 20% for drugs, 11% for equipment and buildings (including depreciation) and 15% for other costs. The study also looked into the revenue available at district level: the main source of revenue (85%) was from the Ministry of Health. The potential for cost recovery was hardly exploited and revenue from user fees was negligible, [39].

2.5.2- The health service coverage of quality-certified primary health care units in Metro-Manila, the Philippines:

Introduction: In 1998, the Philippines' Department of Health implemented the Quality Assurance Programme, known as the Sentrong Sigla (Centre of Vitality) Movement, starting with primary health care units. The Department established the National Objectives for Health in 1999,

which set targets for health status and service coverage by 2004. The Movement certifies primary health care facilities that comply with its list of quality standards. Three years after implementation of the Sentrong Sigla Movement, the present study assessed it as an intervention for the delivery of health care services. Specifically, it evaluated the 2001 service coverage among certified facilities and compared it with that of non-certified facilities in the National Capital Region (Metro-Manila) of the Philippines, and related service coverage to the targets of the National Objectives for Health for 2001.

Results: The overall 2001 service coverage showed that certified facilities had significantly less success in the preventive and monitoring programmes than the non-certified facilities, but were not significantly different in the curative programmes. Neither type of facility reached the targets of the 2001 National Objectives for Health for preventive programmes. After adjusting for clustering, the certified facilities showed significantly lower service coverage, compared with non-certified facilities, only for enrolling new acceptors to the Family Planning Programme and for water-supply testing in the Environmental Sanitation Programme, [40].

2.6- Community-Based Initiatives:

2.6.1- Introduction:

The concept of health for all was adopted by the World health organization assembly in the late 1970s, and primary health care was adopted as the right approach for achieving the optimum level of health for each individual. The target of health for all by the year 2000, however, could not be achieved due to strategic deficiencies-mainly a weak community role, poor intersectoral action, a top-down approach to development, and focusing investment on physical infrastructure while neglecting the human dimensions of development, [29].

It has been acknowledged that health cannot be achieved in isolation: it requires an integrated multisectoral development approach, establishing active partnerships between communities and other stakeholders. Major determinants of ill health such as illiteracy, overpopulation, poor food and nutrition, poor sanitation, lack of developmental opportunities, rising scales of poverty and inadequate awareness lie outside the scope of the health sector and mainly related to socioeconomic and cultural aspects of civil society. Among the underprivileged population, in addition to ill health, there exist a persistent combination of unemployment and underemployment, economic poverty, low levels of education, poor housing, malnutrition, gender insensitivity and social apathy. It would therefore be unfair to expect any substantial health improvements without removing these constraining conditions, [29].

It has also been observed that health and quality of life are closely interlinked and mutually dependent. Improvement of quality of life depends on families having better health status, literacy, living conditions and income resources. On the other hand, by promoting better quality of life, we can encourage human development and subsequently can improve the health situation, [29].

In the light of the above, WHO's Regional office for the Eastern Mediterranean introduced the following community-based initiatives (CBI):

- Basic development needs approach
- Health villages programme (HVP)
- Health cities programme (HCP)
- Women in health development

The basic development needs (BDN) approach is an integrated socioeconomic development aiming to achieve health for all by enhancing the quality of life of the members of a community and reducing poverty. It is based upon self-reliance, self-financing and self-management by organized, empowered and actively participating communities, supported through coordinated intersectoral actions, [29].

In addition to the above, WHO is supporting member countries to promote proactive role of women in health and development issues in order to facilitate the expansion of gender sensitive policies and programmes in a multisectoral framework and improving the socioeconomic status of the women, [29].

These community based initiatives provide a new stimulus for health and human development, and have initiated a transformation process whereby communities are playing a active role and multisectoral government functionaries are providing support for sustainable local development in order to improve the quality of life and health of the people, [29].

2.6.2- WHO Healthy City Project:

Shendi was selected as the pilot project for launching healthy city project in Sudan that was in September 2002, to help the people in the city to lead a socially and healthy productive life. Basic community structures were formulated and trained in the first quarter of 2003. The Shendi Healthy City Project (SHCP) was initiated in March 2003, according to a concept that has been pursued in several other countries, (health, education, electricity, water, woman development, markets, streets, transportation, training, entertainment, agriculture, clubs, and veterinary), [11]. Problems were identified and prioritized by community, [42]. Constraints are limited resources of the locality, poor financial condition of the community in spite of their well participation, inter-sectoral collaboration and coordination needed to be further enhanced, and community culture and concepts about the project need to be changed.

Chapter (3)
Methodology

3.1- Type and period of the study:

This study is descriptive cross-sectional community & facility–based study. It was conducted in Shendi locality, between September, 2007 – April, 2010, to evaluate the application of the health area system.

3.2- Study area:

Shendi locality is one of the localities of the River Nile State. It is bounded by Khartoum state to the south, Elddamer locality to the north, River Nile to the west and Gadarif state to the east. The total area of the locality is about 14596 Km2, [41]. The rural areas of the Shendi locality are composed of about 96 villages, 63 of these villages are at southern side of the locality, [41], [42]. Topographically the Locality lies on a' flat mud-sandy area adjacent to the River Nile with a few scattered mountains in the eastern part and is accessible all year, [42]. Geographically it lies between line 36 east to 31 west longitudinal and line 19 north to line 15 south latitudinal in the arid zone of Sudan with an annual rainfall ranging' between 0 and 119ml per year. It is situated on the main River Nile, which provides the water for the agricultural land. The main plants are cash crops such as white beans, onions, wheat and sorghum as well as ep, goats and camels are practiced both by the few nomadic 'Rashaida' and the settled farmers, [42].

Culturally the population of Shendi is a mixture of the various

cultures that occur in Sudan though the Northern tribes, particularly ElGaalien, are predominant. The total population of Shendi 'Mahalia' is estimated at about 245000 of whom 175000 live in rural areas, Kaposhia and Hajer-Elasal 70000 in urban centers, [43], most of them are farmers. The total number of the families are 43340 in the Shendi locality, (Shendi city = 11500, Shendi rural = 16670, Kaposhia = 7720, Hagar-Elasal = 7450), (Mahalia, 2008). About 60 % of the population is rated as poor. Growth Rate: 2.3%, Male 48.7%,   Female %   51.3%. In addition, average of family size is 6 members, [42]. 78% of the population depends upon subsistence agriculture while the rest are traders, teachers and handcraft workers, including spinners, weavers and other artisans. About 60% of the population is rated as 'poor'.

The literacy rate is high in the towns and villages in the locality. Basic Education consist of (112) primary schools. Secondary Education consist of (17) secondary schools. Shendi University was established in the early 1990s and includes (7) faculties in the locality, [42].

Shendi Mahalia, is one of the five Mahalias of the River Nile State. It has full authority over all administrative affairs in its own area, [42]. Shendi Mahalia administratively is divided into four unites, Shendi town, Shendi rural, (South rural, North rural), Hagar Al-Asal and Kaposhia, [42].

Many governmental and private health services were established, to provide health care to the community. There are many hospitals (ten), health centers (38), basic health units (17), and others health programs in the locality, (MCH and expanded program of immunization (EPI)). Moreover, environmental Health and Sanitary activities are carried out by the Environmental Health staff, [44]. The number of the health workers in the in the health services in the locality is (215), (40) of them is medical assistant,

(9) is general doctor, (22) is nurse with certificate, (2) is health visitor, (17) is health visitor assistant, (35) is midwife, and (eight) is health worker, [43]. The major constraints facing the heath facilities in the locality are the small number of qualified staff, lack of training courses, and the shortage of equipments, [44], [42].

3.3- Study population:

1- Health facilities in the study area, which are:

- rural hospitals
- health centres
- dispensaries
- basic health units

In addition, tertiary care hospital in Shendi city, (Shendi Teaching hospital & Al-MEK Nemir University hospital).

2- Health workers in the health facilities of HAS:

- doctors
- medical assistants
- sisters & nurses
- techniques laboratory
- pharmacists
- midwives and health visitors
- health officers
- statisticians

Moreover, those health workers in Shendi teaching hospital & Al-Mak Nemir university hospital were not included.

3- Health managers & HAMTs:

- directors of health program in the state ministry of health:

(under secretary, director of PHC, director of curative medicine,

director of preventive medicine, director of environmental health, director of health affairs, director of epidemiology, and director of school health).

- directors of health program in Shendi locality:

(director of health affairs, director of PHC, health inspector, dispensaries inspector, director of immunization program, director of MCH program, director of nutrition program, director of school health, and director of health information).

4- Community leaders.

- public leaders in the legislation councils in the locality

- managerial officers in the legislation councils in the locality

5- Users of health facilities:

- people found in the health facilities during the period of data collection

- people live around the health facilities

6- Managers of health related sectors:

- agriculture

- irrigation

- education

- sport & youths

- informations

3.4- Sample size:

The total of sample size of this study is 718. This sample size was taken of different classes from the community and health facilities of PHC in the locality by using stratified sampling then random simple sampling was used for each class of the community study as in the following:

- Total coverage of the health facilities and health services (56); include (rural hospitals (seven), health centres (36), dispensaries (eight) and basic health units (five).

- Total coverage of the health workers, (209), in (rural hospitals, health centres, dispensaries and basic health units).

- (30) of the health programs managers of health in ministry of health of River Nile state and in Shendi locality.

- (four) Managers of Shendi teaching hospital, (two) & Al-Mak Nemir university hospital, (two), director general and medical manager of each hospital).

- (five) of the managers of health related sectors.

- (3o) of the community leaders.

- (384) of the users of the health facilities from the community.

4.5- Sample technique:

Stratified sampling technique was used to select suitable sample size then a simple random sampling was run to take (384) person of the users of the health facilities from Shendi population, (245000), as a representative sample to fill the questionnaires.

A total of 384 persons were selected. This sample size was sufficient to provide 95 % assurance that the margin of error did not exceed .05 assuming that the population of Shendi locality is (245000) person. The formula used is:

n = NZ2 S2 / Nd2 + Z2 S2

Where: n: is the sample size

N: is the population = 245000

Z $(1-\alpha/2)$:   is 1.96 for a 95 % confidence level

S: Standard deviation = 2

d : is the difference between population mean and sample mean = 1

The following table shows the percent of selected sampling of people of each administrative unit in Shendi locality.

Unit	No. of families in Shendi locality	Percentage % of sample	Sample size
Shendi city	11500	% 27	104
Rural of Shendi	16670	% 38	146
Kaposhia	7720	% 18	69
Hager Elasal	7450	% 17	65
Total	43340	% 100	384

3.6- Data collection:

Data was collected by the following means:

A – Structured questionnaires to be filled with:

 1- Health managers.

2- Health workers.

3- Users of the health facilities.

B – Structured interviewing with:

1- Managers of Shendi teaching hospital and Al-Mak Nemir

university   hospital.

2- Managers of health related sectors.

C – Focus group discussion was done for the community leaders.

1- Public leaders of the community in Shendi locality.

2- Public managerial officers in Shendi locality.

D - Observation during visiting was done to health facilities using designed checklists.

The interviewing, groups discussion and observations were done by the researcher him self or his trained assistants.

3.7- Data analysis:

The collected data from the questionnaires was analyzed by entering it into computer and analyzed using the statistical package for social sciences programs (spss), and then results were presented in tables and figures. Chi-square test was used for testing the associations. The level of statistical significance was set at P-value equal to or less than 0.05 for all tests.

Chapter (4)

Results

4.1- Quantitative results:

4.1.1- Coverage & accessibility:

Figure (1): shows the availability of health facilities in the area. N=61
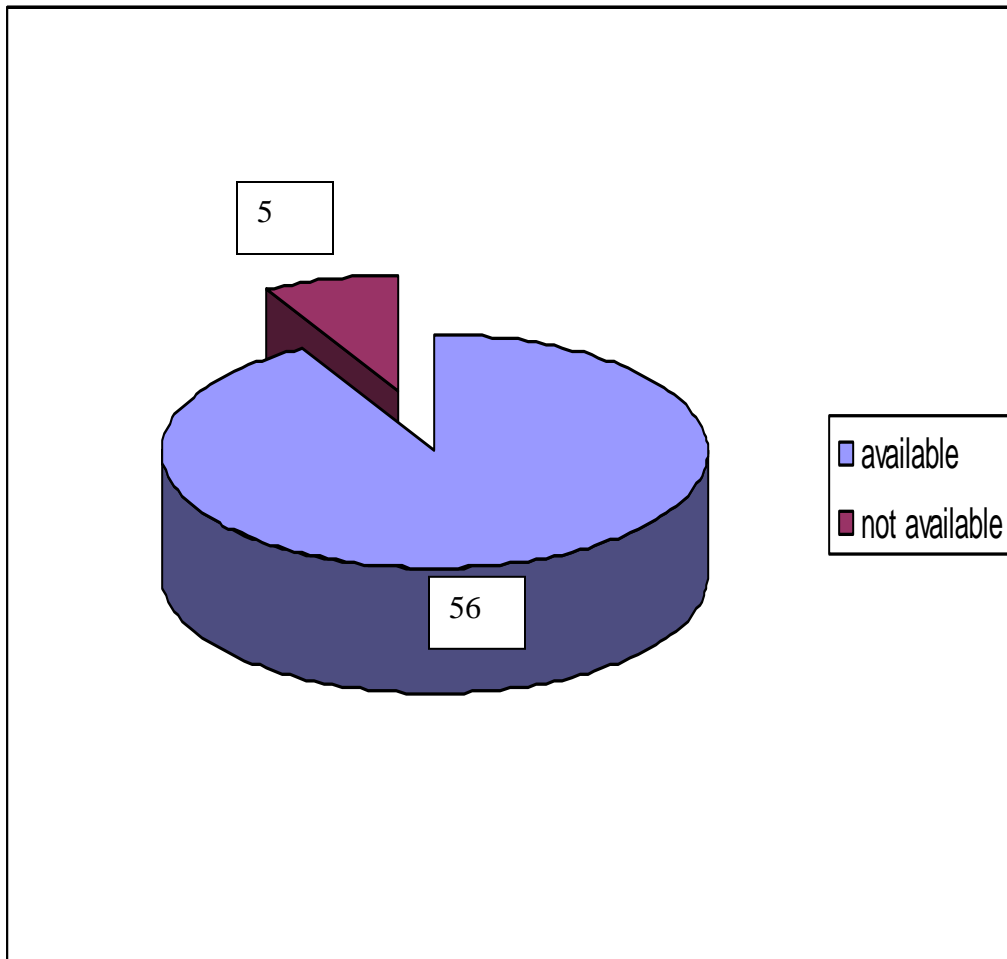
This figure shows that (8%) of the study area with out any kind of health facilities, and (92%) has health facility.

Figure (2): shows the types of the health facilities.

N=56
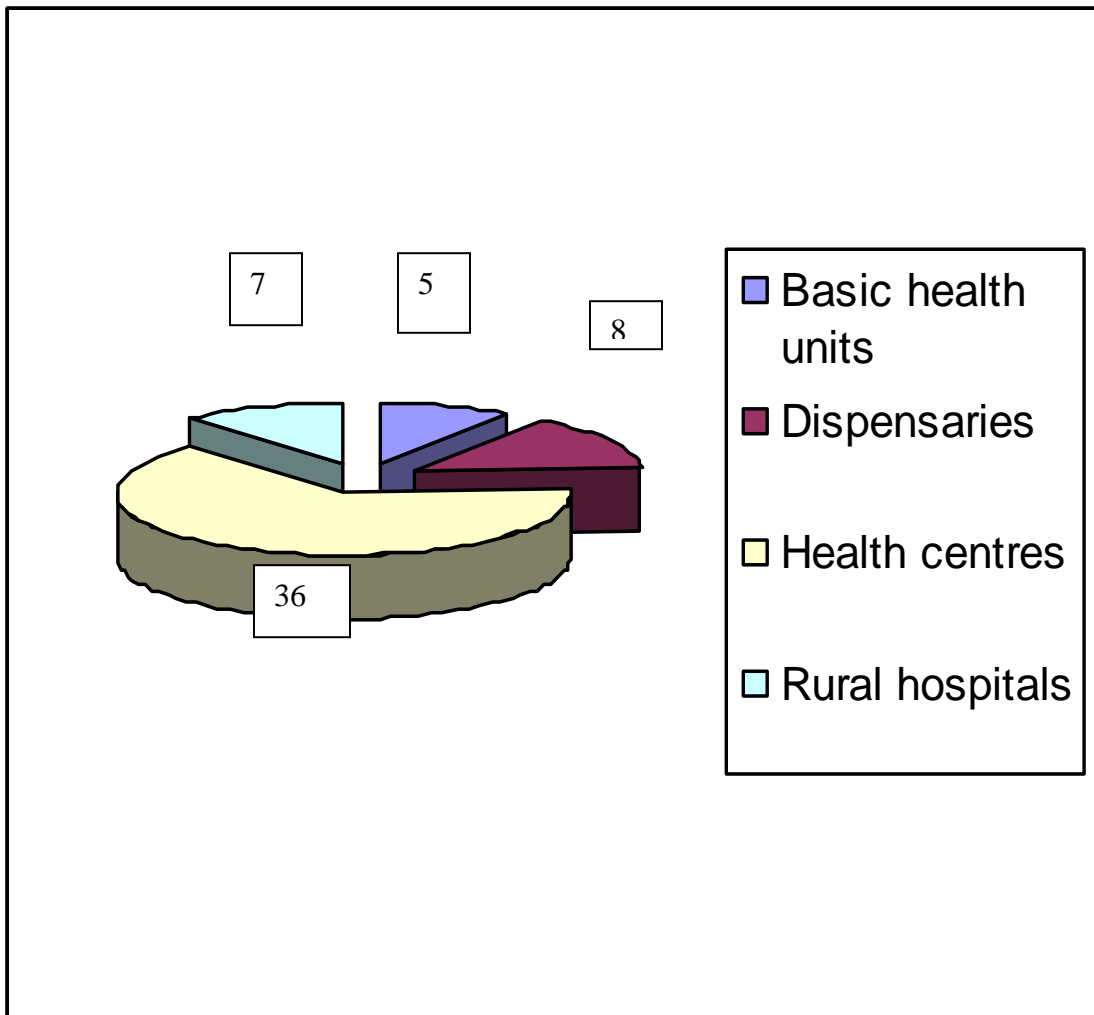
The study shows that (9.3%) of the health services are basic health units, (14.6%) are dispensaries, (64%) are health centres and (12%) rural hospitals, as in the above figure.

Table (1): shows the health facilities according to the administrative units.

N=56

Health facilities	Administrative units				Total
	Shendi city	Rural of Shendi	Kaposhia	Hajer-elasal	
Basic health units & dispensaries	-	5	4	4	13
Health centers	11	14	3	8	36
Rural hospitals	-	4	1	2	7

Total	11	23	8	14	56

Table (2): shows the accessibility of the health facilities for the population, according to the observation of the health facilities. N=56

Variables	Frequency	Percent
Easy to reach	48	85.7
Not easy to reach	8	14.3

Total	56	100

Figure (3): shows the health facilities accessibility, according to users.

N=384
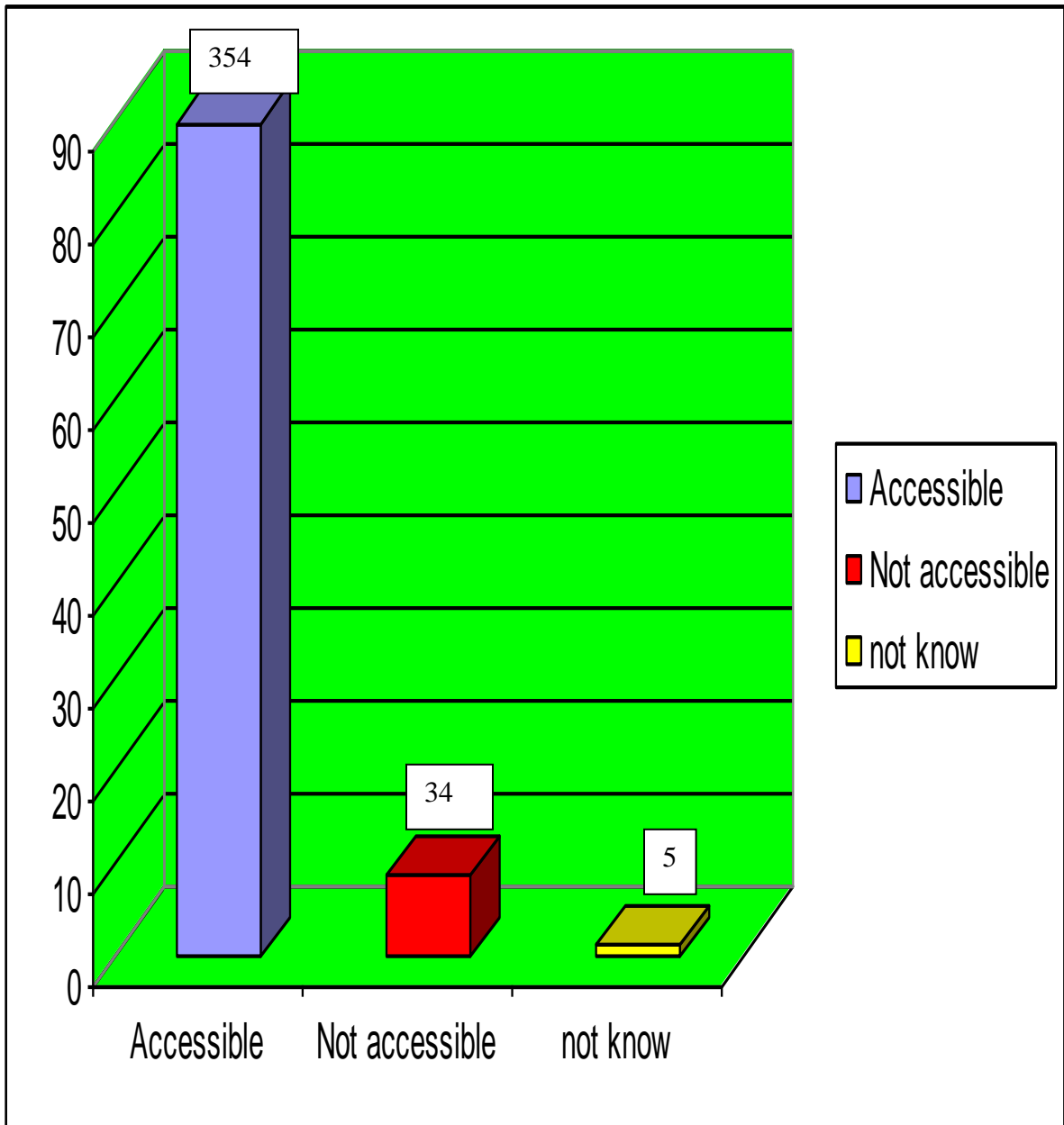
The health facilities accessibility is (89.8%) accessible, (8.9%) not accessible, and (1.3%) not know, as in the above figure.

Table (3): shows the availability of the health unit, according to the distance.

N=384

Variables	Frequency	Percent
In the area	353	91.9
Near the area	23	6
Far from the area	8	2.1
Total	384	100

Table (4): shows the availability of the health unit in the area & the health facility accessibility.

N=384

Availability of h. Unit	Accessibility of h. unit			Total
	accessible	Not accessible	Not know	
Available	322	25	5	352
Not available	20	9	3	32
Total	342	34	8	384

Table (5): shows the methods of reaching to the health facility & the health facility accessibility.

N=384

Methods of reaching to the health facility	Accessibility of health facility			Total
	Yes	No	Not know	
On foot	284	2	3	289
On animal	24	4	1	29
On car	36	25	1	62
Other	1	1	2	4
Total	345	32	7	384

Figure (4): shows the building condition status of the health facilities.

N=56
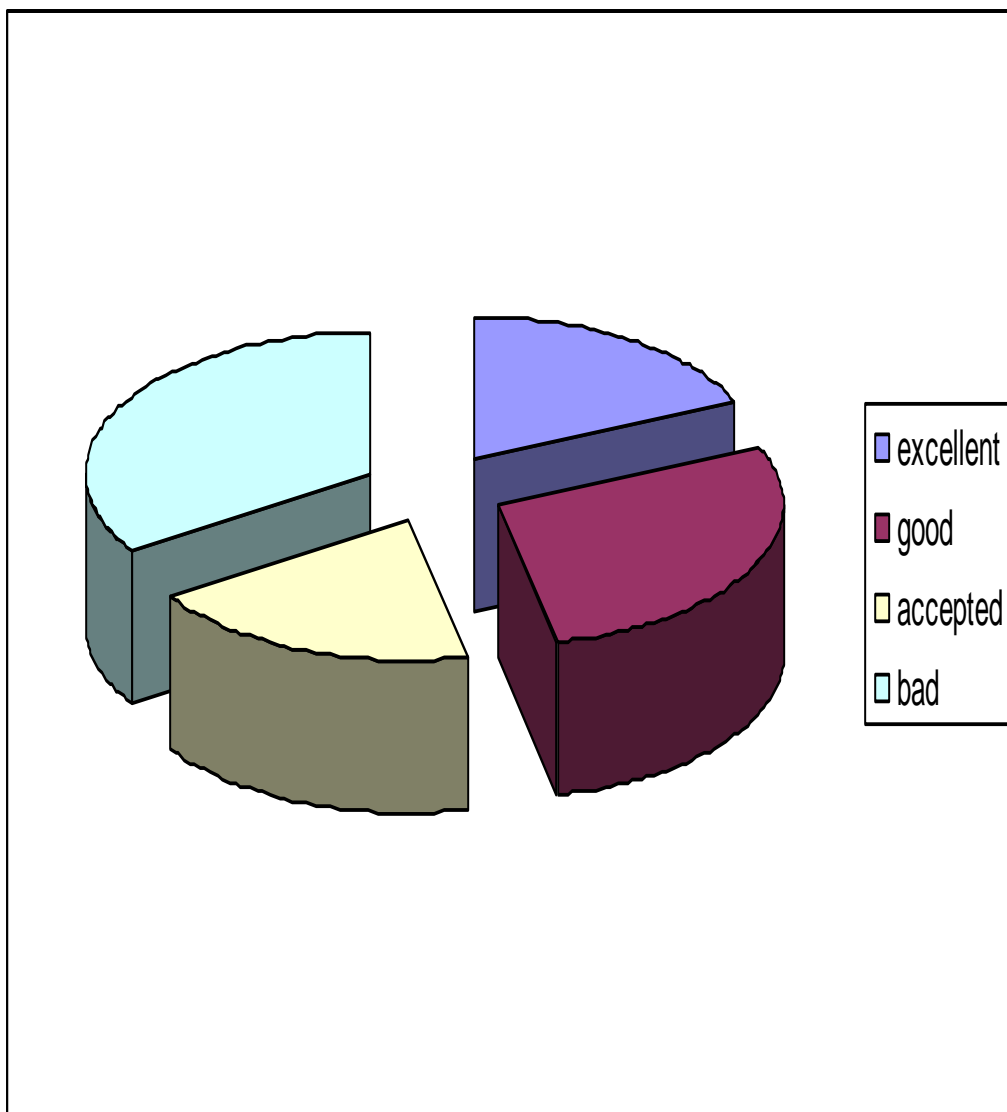
The building condition status of the health facilities are, (18%) excellent, (28.5%) good, (19.5%) accepted, and (34%) bad, as in the above figure.

Table (6): shows the types of health facilities & the buildings condition status of the health facilities.
N=56

Types of health facilities	Building condition status			total
	Excellent	Good & accepted	bad	
Basic health units & dispensaries	-	2	11	13
Health centres	11	14	11	36
Rural hospitals	2	4	1	7
Total	13	20	23	56

Table (7): shows the types of health facilities & the number of beds in the health facilities.

N=56

Health facilities	Number of beds					Total
	No beds	Less than 10	10-20	21-30	More than 31	
Basic health units & dispensaries	10	3	-	-	-	13
Health centers	17	17	2	-	-	36
Rural hospitals	-	-	1	2	4	7
Total	27	20	3	2	4	56

Table (8): shows the distribution of the health facilities in areas of the locality, according to the health managers.

N=30

Variables	Frequency	Percent
Equitably Distributed	8	26.7
No equitably distributed	22	73.3
Total	30	100

Table (9): shows the number of people covered by health facilities of HAS & the distribution of the health facilities in areas of the locality, according to the health managers.

N=30

No. of people	Distribution of the health facilities in areas		Total
	Yes	No	
Less than 10000	-	3	3
10000-20000	1	7	8
More than 20001	4	10	14
Not know	3	2	5
Total	8	22	30

Figure (5): shows the types of the health workers in Shendi locality.

N=209
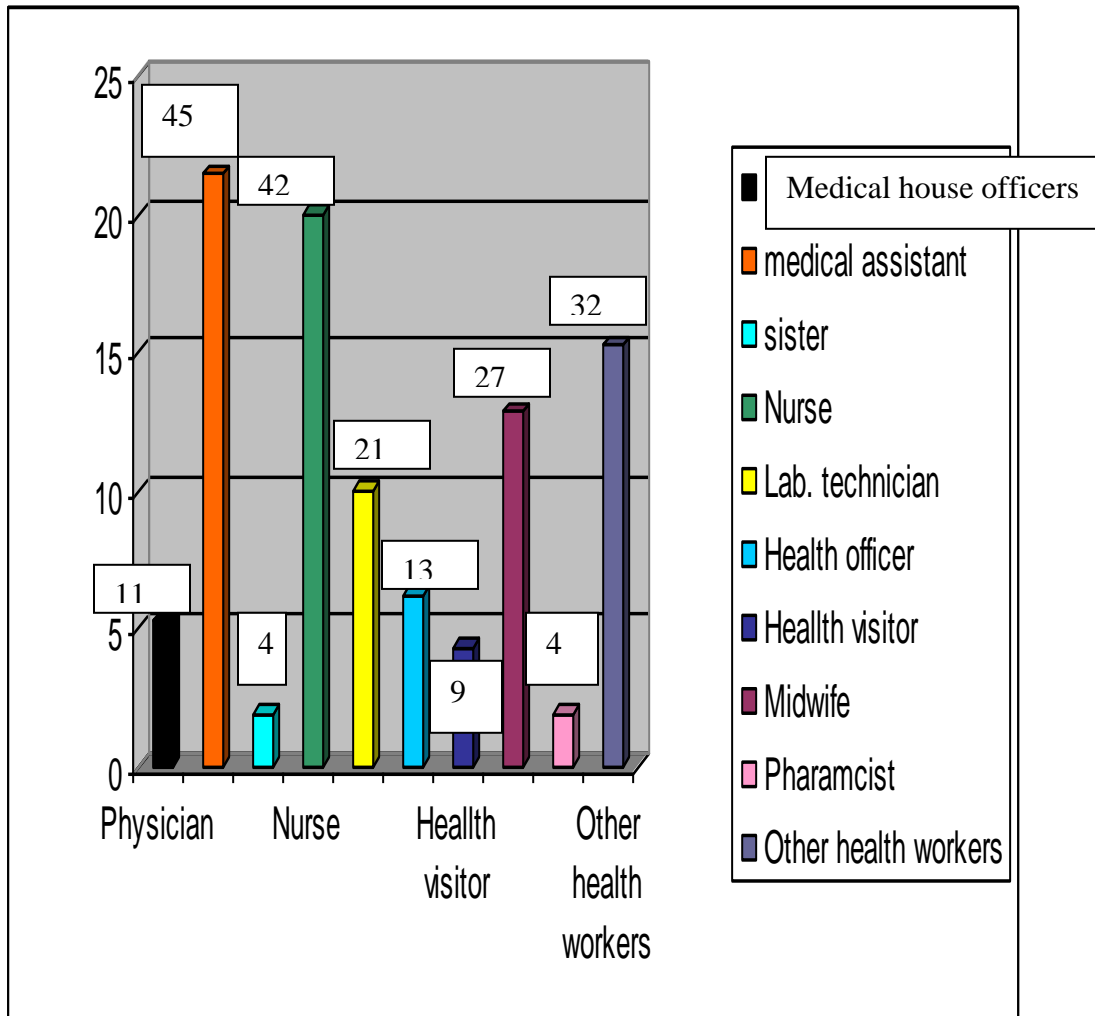
(5.3%) of the health workers are medical house officers, (21.5%) are medical assistants, (1.9%) are sisters, (20%) are nurses, (10%) are lab. technicians, (6.2%) are health officers, (4.3%) are health visitors, (12.9%) are midwives, (1.9%) are pharmacists, and (15.3%) are other health workers, as in the above figure.

Health workers in Shendi teaching hospital & Al-mak Nimir university hospital were excluded.

Table (10): shows the distribution of the health workers according to the administrative units.

N=209

Administrative units	Frequency	Percent
Shendi	54	25.8
Rural of Shendi	67	32.1
Kposhia	45	21.5
Hajer-elasal	43	20.6
Total	209	100

Table (11): shows the types of the health facility & the number of health workers in the health facility.

N=56

Type of h. facility	Number of health workers in the health facility			Total
	Less than 3	3-6	More than 6	
Basic h. Unit & dispensary	11	2	-	13
Health center	20	9	7	36
Rural hospital	-	-	7	7
Total	31	11	14	56

Table (12): shows the types of the health facilities according to the number of the population.

N=56

Type of h. facility	Number of population				Total
	Less than 5000	5000-10000	10001-15000	More than 15000	
Basic h. Unit & dispensary	11	2	-	-	13
Health center	15	10	6	5	36
Rural hospital	-	3	2	2	7
Total	26	15	8	7	56

Table (13): shows the types of health services presented by the health facilities.

N=30

Variables	Frequency	Percent
Curative only	12	40
Preventive only	3	10
Promotive only	1	3.3
Curative, preventive & promotive	14	46.6
Total	30	100

4.2- Knowledge of the HAS concept & decentralization concept:

Figure (6): shows the knowledge of the health area system concept, according to health managers.

10
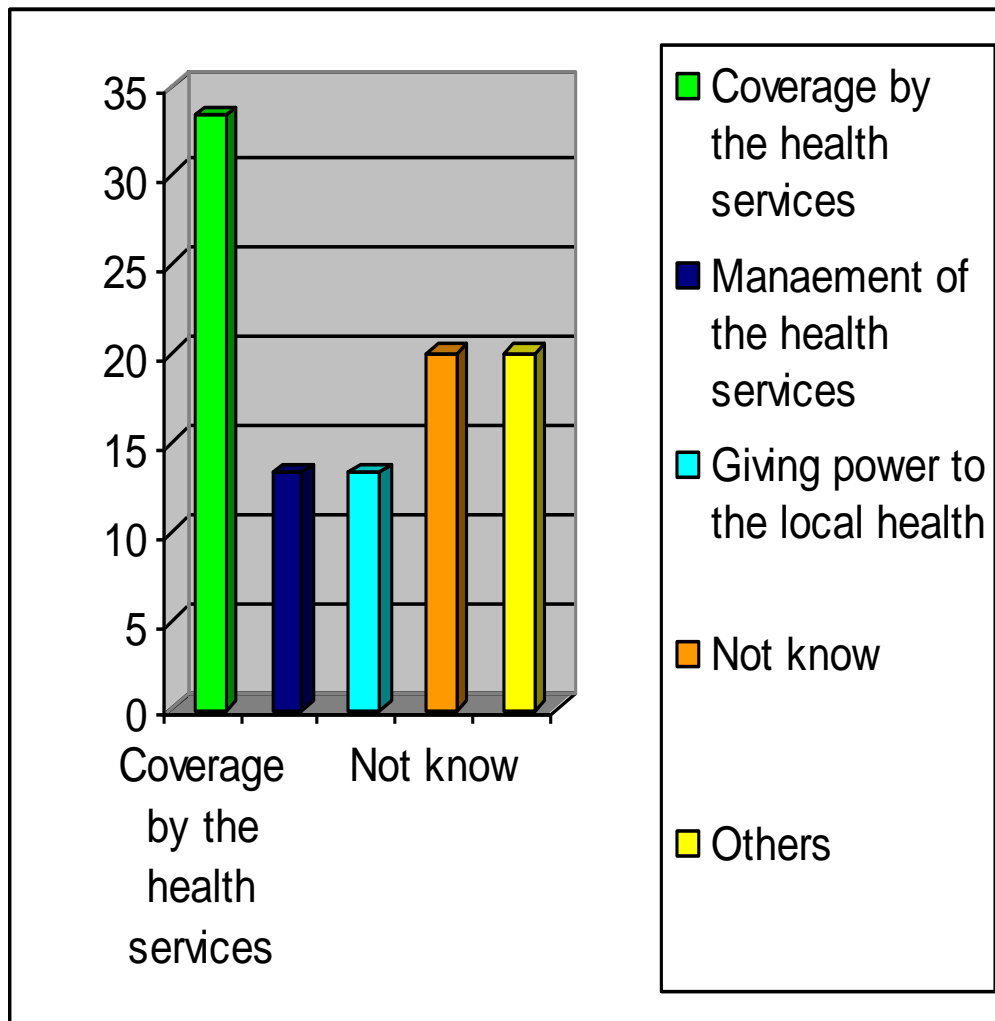
Health managers define HAS as, (33.3%) coverage by health services, (13.3%) management of health services in the area, (13.3%) giving power to the local health, (20%) not know, and (20%) others, as in the above figure.

Figure (7): shows the knowledge of the health system decentralization concept, according to the health managers. N=30
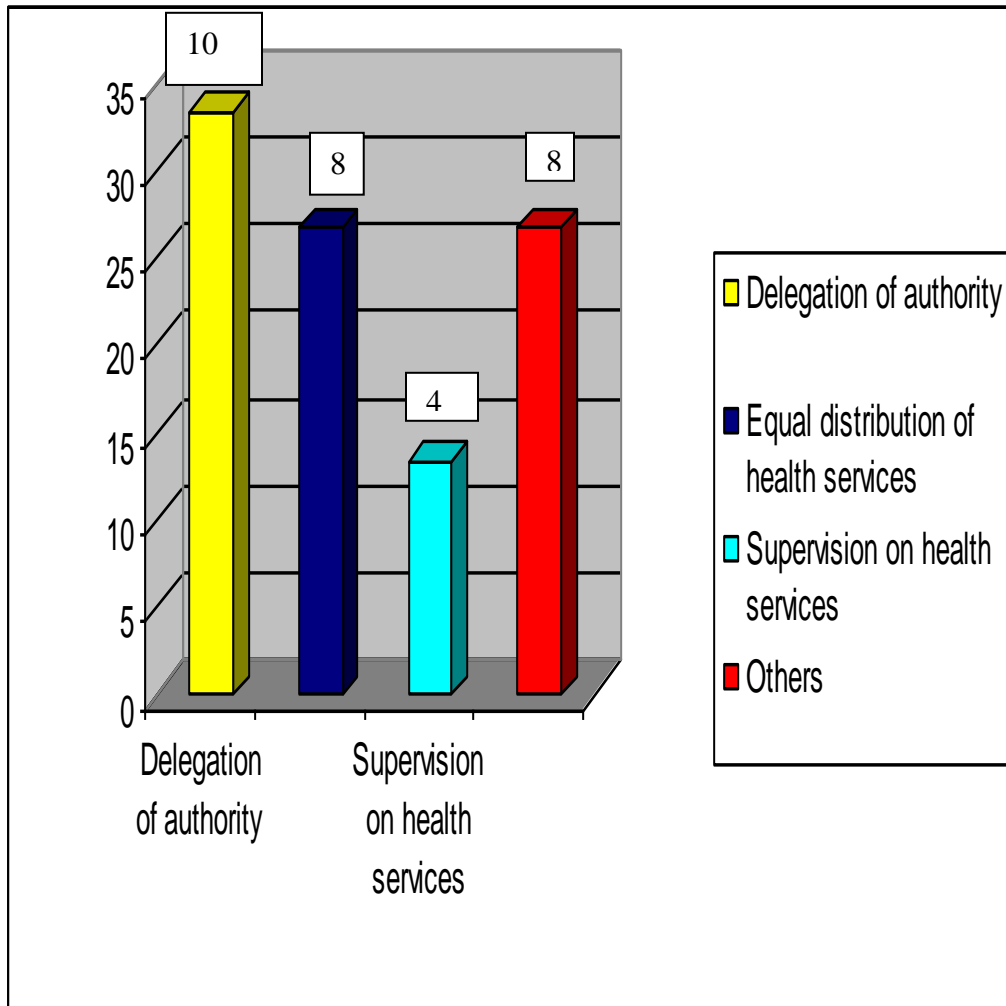
Health leaders define decentralization in health system as, (33.3%) delegation of authority, (26.7%) equal distribution of the health services, (13.3%) supervision on health services, and (26.7%) others, as in the above figure.

Table (14): shows the types of the health facilities according to the availability of the referral services.

N=56

Type of h. facility	Referral system			Total
	Available	Not available	Sometimes	
Basic h. Unit & dispensary	9	4		13
Health center	29	3	4	36
Rural hospital	6		1	7
Total	44	7	5	56

4.3- Availability of resources at HAS level:

 Figure (8): shows the over all supply (money, manpower, and equipment) to the health facilities, according to the health

managers.

N=30

Pie chart with values 4 (Not know), 4 (Enough), 22 (Not enough). Legend: Enough, Not enough, Not know.
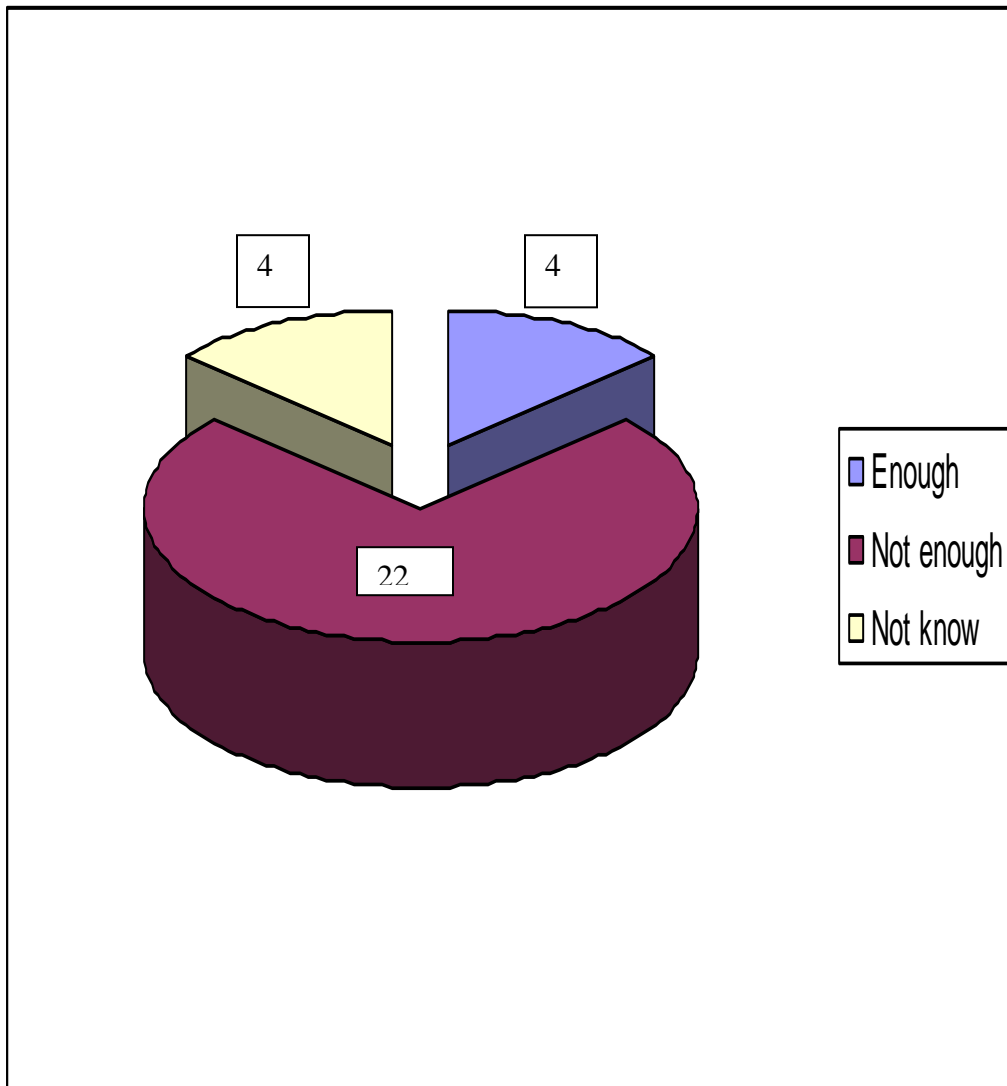
    (13.3%) Of the overall supply (money, manpower, and equipment) to the health facilities are enough, (73.4%) are not enoug , (13.3%) are not know, as in the above figure.

Table (15): shows the supply by the equipment to the PHC facilities, according to health managers.

N=30

Enough	Frequency	Percent
Yes	1	3.3
No	12	40
Sometimes	15	50
Not know	2	6.7
Total	30	100

Table (16): shows the supply by the manpower to health facilities, according to the health workers.

N=209

Variables	Frequency	Percent
Enough	41	19.6
Not enough	115	55.1
Sometimes	53	25.4
Total	209	100

Table (17): shows the supply for the allocated budget to health facilities, according to the managers of the health facilities. N=56

Variables	Frequency	Percent
Enough	1	1.8
Intermediate	9	16.1
Not enough	43	76.8
Not know	3	5.4
Total	56	100

4. 4- Management of HAS:

Figure (9): shows the status of supervision of the health facilities.

N=56
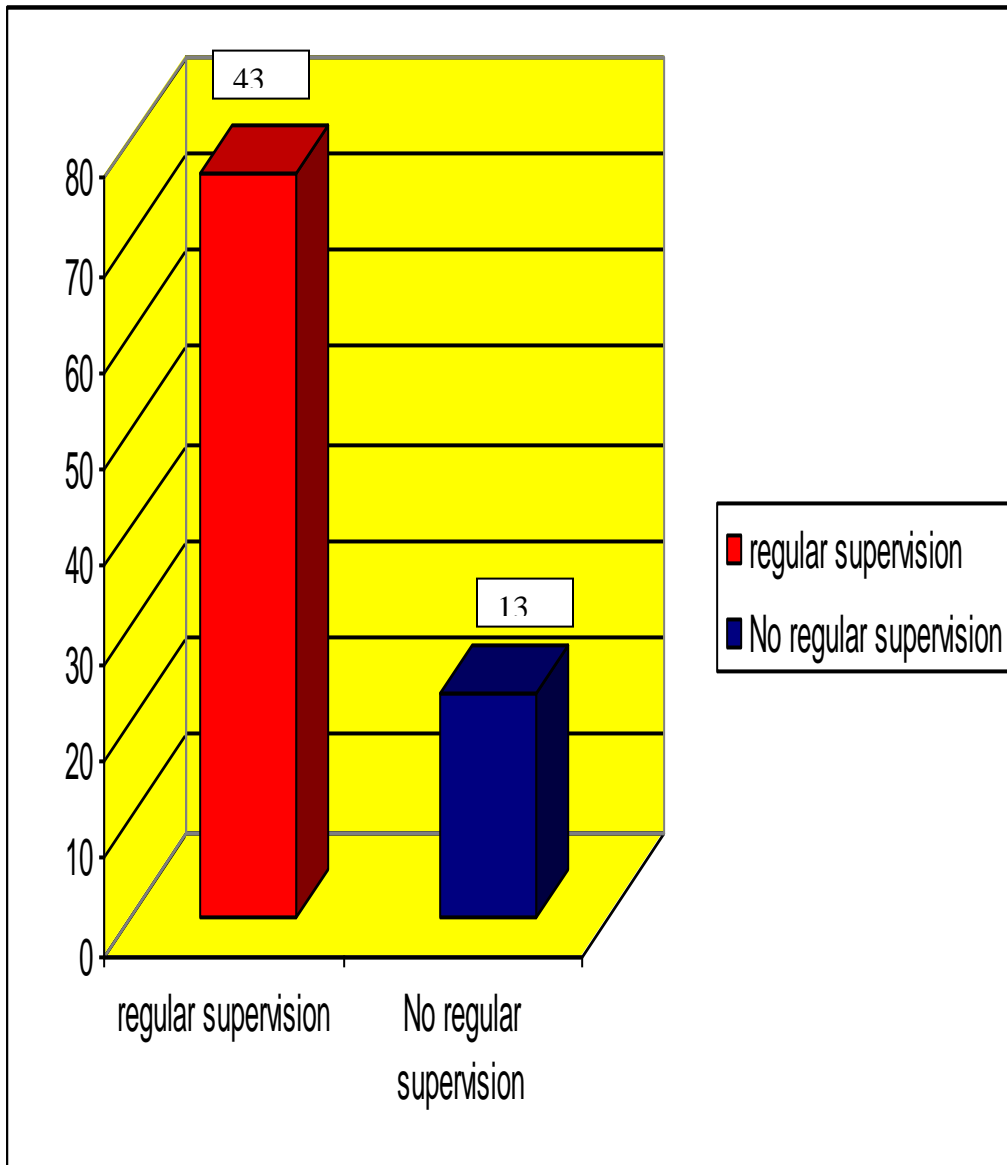
(76.8%) of the health facilities have regular supervision, and (23.2%) have no regular supervision, as in the above figure.

Figure (10): shows the methods of supervision.

N=56
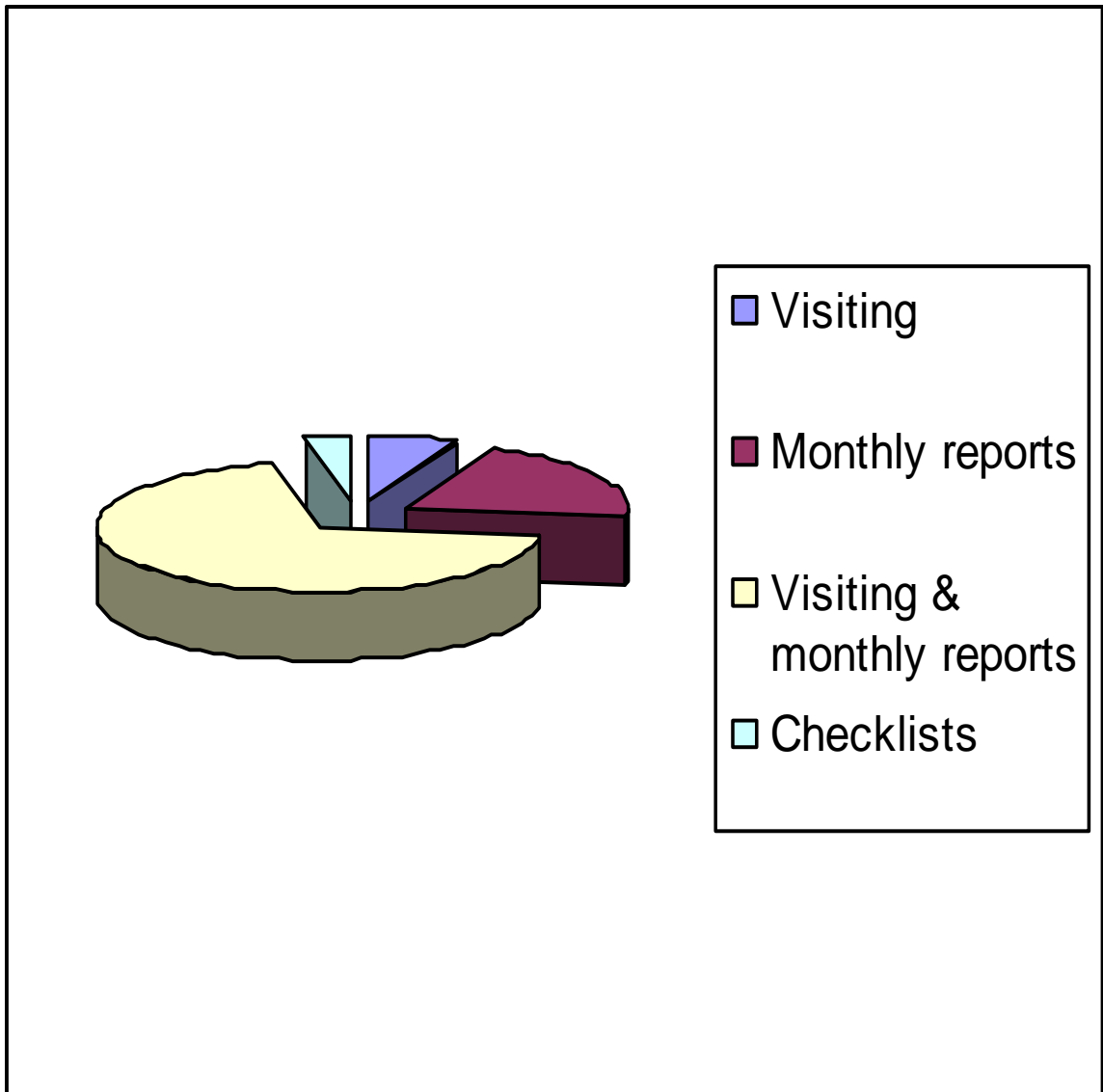
The methods of supervision for the health facilities are, visiting (7%), monthly reports (20%), visiting & monthly reports (70%), and checklists (3%), as in the above figure.

Table (18): shows the types of the health facilities & the methods of supervision.

N=56

Type of h. facility	Methods of supervision			Total
	Visit	Monthly report	Both	
Basic h. Unit & dispensary	1	8	4	13
Health center	1	19	16	36
Rural hospital	-	3	4	7
Total	2	30	24	56

4.5- Training:

Table (19): shows the availability of continuous training for the health workers.

N=30

Variables	Frequency	Percent
Available	17	56.7
Not available	13	43.3
Total	30	100

Figure (11): shows the health workers have training course during their period of work.

N=209
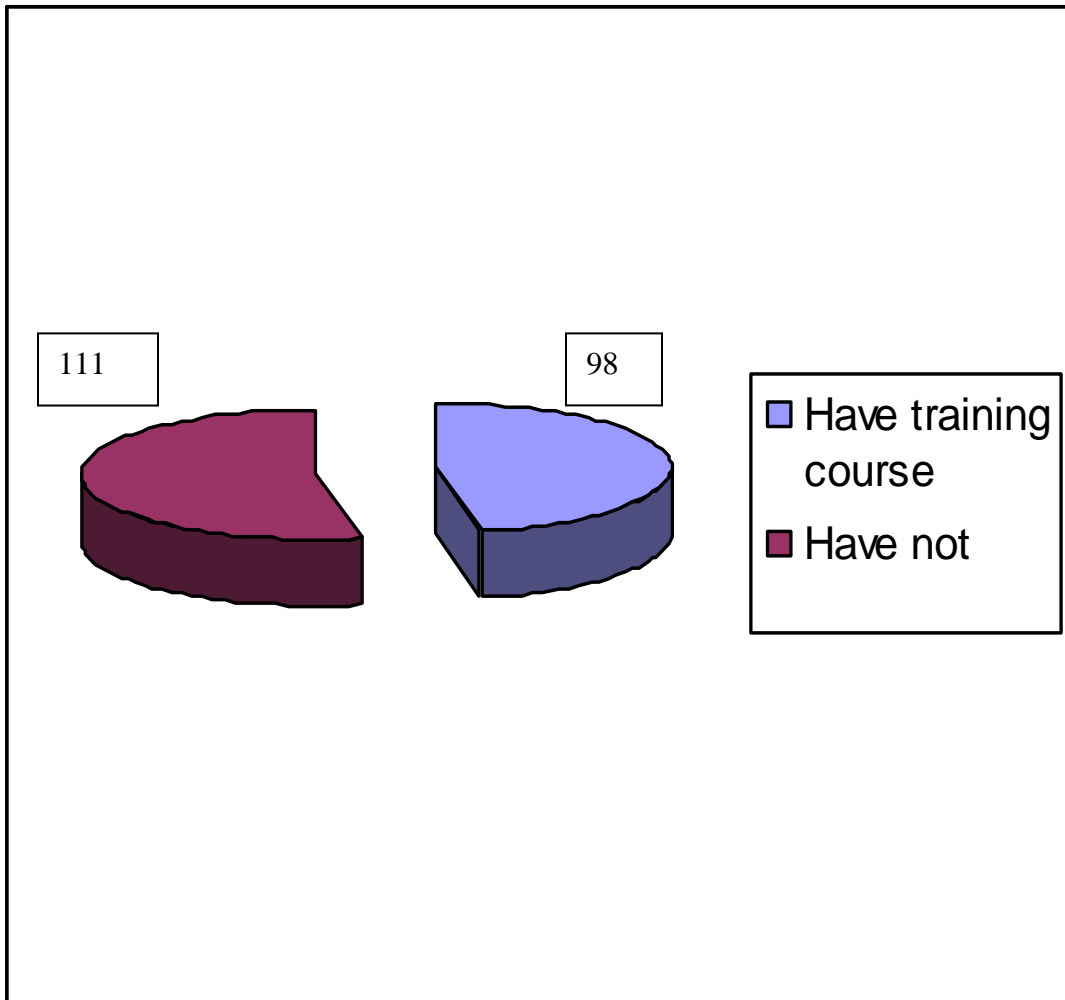
The above figure shows the training course for the health workers during their years of work, (46.9%) of them have training course, and (53.1%) have not.

Table (20): shows the number of training course for the health workers.

N=209

Number of course	Frequency	Percent
Once	121	57.9
Twice	22	10.5
Three times	20	9.6
More than three times	40	19.1
Missing	6	2.9
Total	209	100

Table (21): shows the health facilities participate in training of medical students & health workers.

N=56

Variables	Frequency	Percent
Participate	38	67.9
Not participate	18	32.1
Total	56	100

Table (22): shows the sort of training which the health facilities introduce to the medical students & health workers.

N=56

Variables	Frequency	Percent
Basic	34	60.7
Continuous	12	21.2
Both	10	19.1
Total	56	100

Table (23): shows the number of training courses according to the period of work.

N=98

Numbers of trainings courses	Period of work			total
	Less than 5 years	5-10 years	More than 10 years	
Once	12	10	15	36
Twice	3	7	6	15
Three times	4	3	6	13
More than three times	2	3	27	32
Total	21	23	54	98

4.6- Coordination with health related sectors:

Table (24): shows the availability of coordination in health prevention programs, between health sector & health related sectors, according the health managers.

N=30

Variables	Frequency	Percent
Available	19	63.3
Not available	1	3.3
Some times	7	23.3
Not know	3	10
Total	30	100

Table (25): shows sort of coordination in health prevention programs, between health sector & health related sectors, according the health managers.

N=30

Variables	Frequency	Percent
Exchange of experiences	4	13.3
In health activities implementation	16	53.3
Just in health emergencies	1	3.3
In planning	7	23.3
In evaluation	1	3.3
Others	1	3.4
Total	30	100

4.7- community participation:

Table (26): shows the status of community participation in health programs, according to the health managers.

N=30

Variables	Frequency	Percent
Participated	17	56.7
Not participated	13	40.3
Total	30	100

Figure (12): shows the status of the participation of users in health programs.

N=384
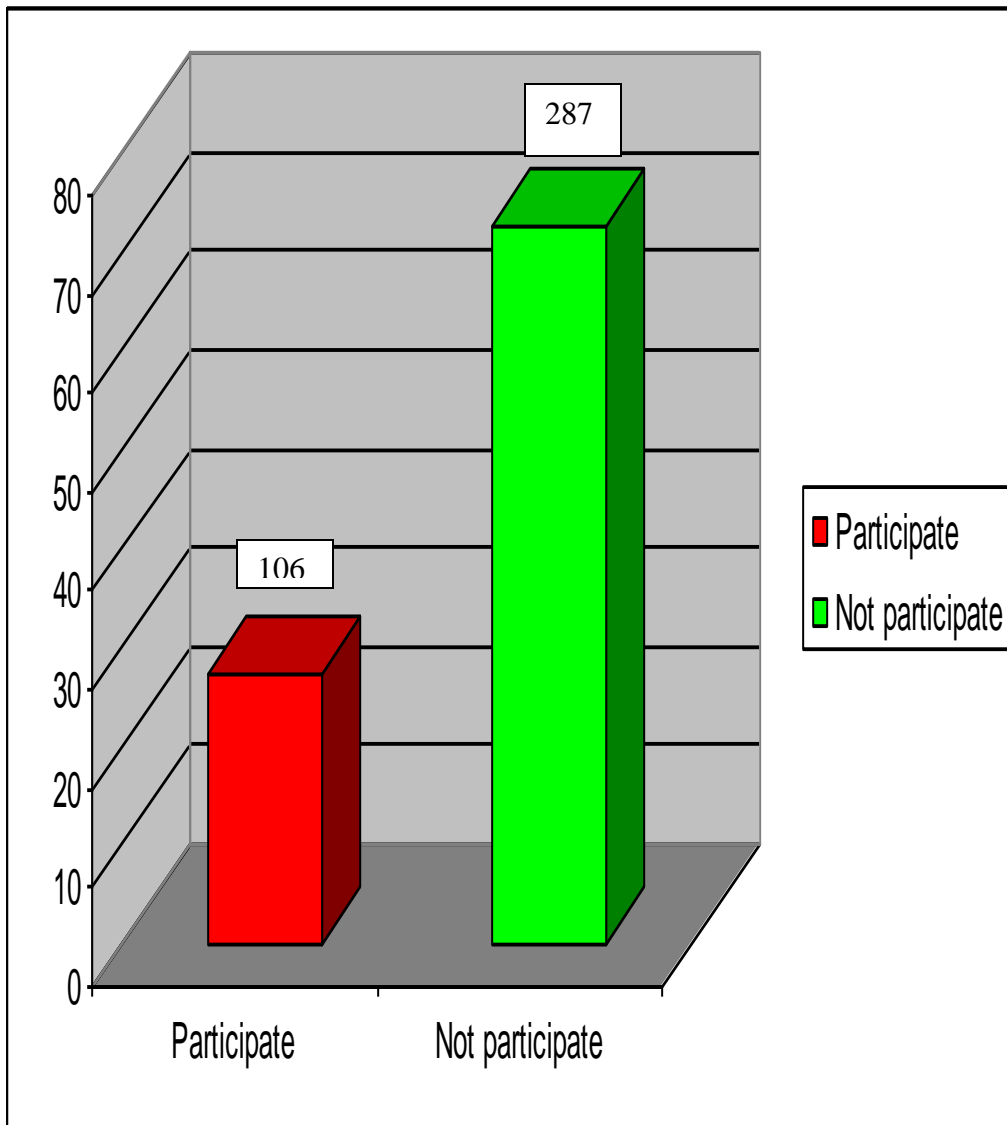
(27.7%) of the users participated in health programs, and (72.3%) not participated, as in the above figure.

Figure (13): shows the sort of the community participation in health programs, according to the users.
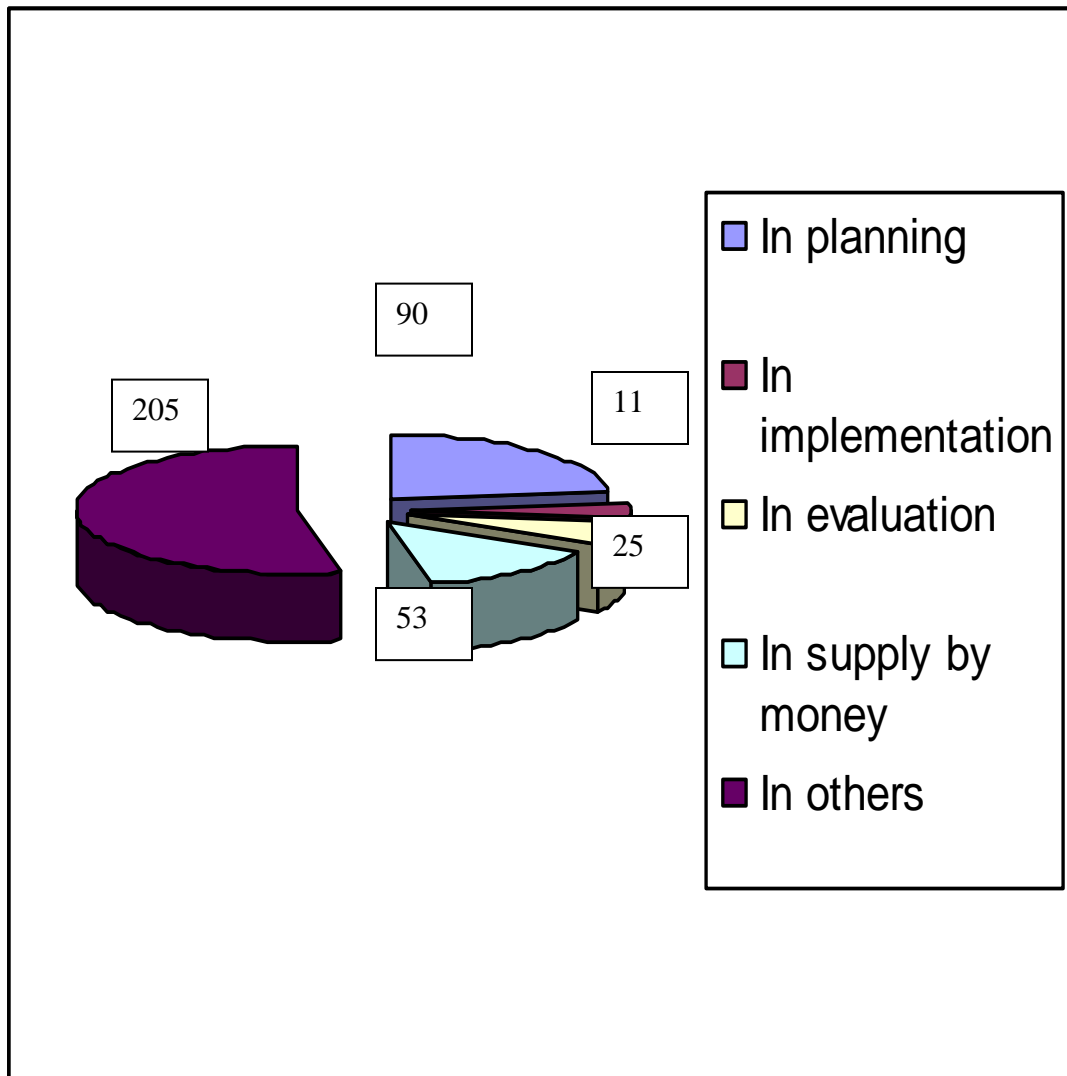
N=384

(23.4%) of the community participated in planning, (3%) in implementation, (6.5%) in evaluation, (13.8%) in supply by money, (53.3%) in others, as in the above figure.

Table (27): Shows the status of the community participation according to the sex.

N=384

Status of participation	Sex		Total	P-value
	Male	Female		
Yes	62	41	103	.053
No	137	144	281	
Total	199	185	384	

P-value equal or less than 0.05

No statistical significant relation between community participation and the sex of the users of the health facilities, because p-value is more than 0.05.

Table (28): shows the status of the community participation according to the age.

N=384

Status of participation	Age				total	P-value
	Less than 15 years	15-30 years	30- 45 years	More than 45 years		
Yes	8	52	27	16	103	.000
No	2	114	112	53	281	
Total	10	166	139	69	384	

P-value equal or less than 0.05

There is statistical significant relation between community participation and the age of the users of the health facilities, because p-value is less than 0.05.

Table (29): shows the status of the community participation according to the education.

N=384

Participated	Education						total	P-value
	illiterate	khaloh	Primary	secondary	university	Above university		
Yes	14	7	26	23	32	1	103	.193
No	42	14	70	94	59	2	281	
Total	56	21	96	117	91	3	384	

P-value equal or less than 0.05

No statistical significant relation between community participation and the education of the users of the health facilities, because p-value is more than 0.05.

Table (30): shows the status of the community participation according to the social status.

N=384

Status of participation	Social status				total	P-value
	single	Married	divorce	widowed		
Yes	35	64	2	2	103	.309
No	79	177	17	8	281	
Total	114	241	19	10	379	

P-value equal or less than 0.05

No statistical significant relation between community participation and the social status of the users of the health facilities, because p-value is more than 0.05.

4.8- Community-based initatives:

Table (31): shows the community-based initiatives may be adopted in the future, according to the health managers. N=30

Variables	Frequency	Percent
Yes	24	80
No	5	16.7
Not know	1	3.3
Total	30	100

Table (32): shows the sort of community-based initiatives may be adopted in the future.

N=30

Variables	Frequency	Percent
Healthy village	5	16.7
Healthy city	7	23.3
Others	1	3.3
Healthy village & healthy city	8	26.7
Not know	9	30
Total	30	100

4.9- Barriers in HAS:

Figure (14): shows the level of acceptance of the health workers performance, according to the health managers.

N=30
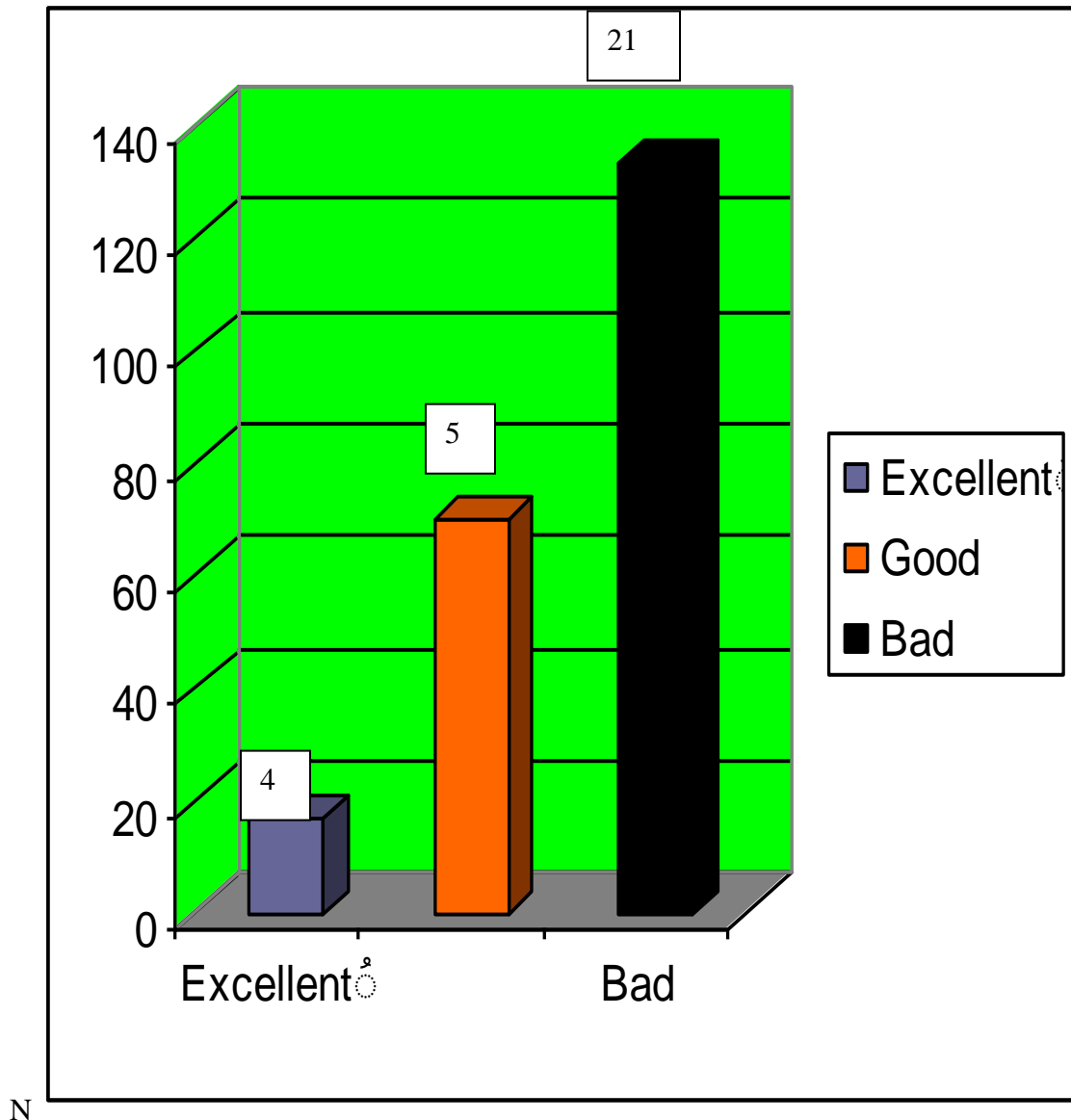
The level of the acceptance of the health workers performance is (16.7%) excellent, (70%) good, and (13.3%) bad, as in the above figure.

Table (33): shows the level of acceptance of the services introduced by the health facilities, according to the users. N=384

Variables	Frequency	Percent
Satisfied	221	57.6
Sometimes	119	31
Not satisfied	44	11.5
Total	384	100

Table (34): shows the barriers in application of the health area system in the locality, according to the health managers.

N=30

Barriers	Frequency	Percent
No active health managers	5	16.7
Shortage in equipments	1	3.3
Shortage in manpower	3	10
No continuous training	4	13.4
No enough supply by money	7	23.3
Poor coordination	1	3.3
Poor community participation	2	6.6
No active health managers & lack of continuous training	3	10
Shortage in supply by money, shortage in equipment, & shortage in man power	4	13.4
Total	30	100

Table (35): shows the barriers in application of the health area system in the locality according to the academic certificate of the health managers.

N=30

Barriers	Academic certificate				Total
	Secondary	Intermediate diploma	university	Above university	
No active h. managers	1	1	2	1	5
Shortage in equipments	-	1	-	-	1
Shortage in manpower	-	1	2	-	3
No continuous training	1	-	2	1	4
No enough supply by money	2	1	3	1	7
Poor coordination	-	-	-	1	1
Poor community participation	-	-	2	-	2
No active health managers & lack of continuous training	-	1	2	-	3
Shortage in supply by money, shortage in equipment, & shortage in man power	-	4	-	-	4
Total	4	9	13	4	30

Table (36): shows the barriers in application of the health area system in the locality according to the period of working in the health field.

N=30

Barriers	Period of working in the health field			Total
	Less than 5 years	5-10 years	More than 10 years	
No active h. managers	2	1	2	5
Shortage in equipments	-	1	-	1
Shortage in manpower	-	1	2	3
No continuous training	2	-	2	4
No enough supply by money	2	1	4	7
Poor coordination	-	-	1	1
Poor community participation	-	-	2	2
No active health managers & lack of continuous training	-	1	2	3
Shortage in supply by money, shortage in equipment, & shortage in man power	-	4	-	4
Total	6	9	15	30

Figure (15): shows the problems in the health facilities, according to the health facilities managers.

N=56
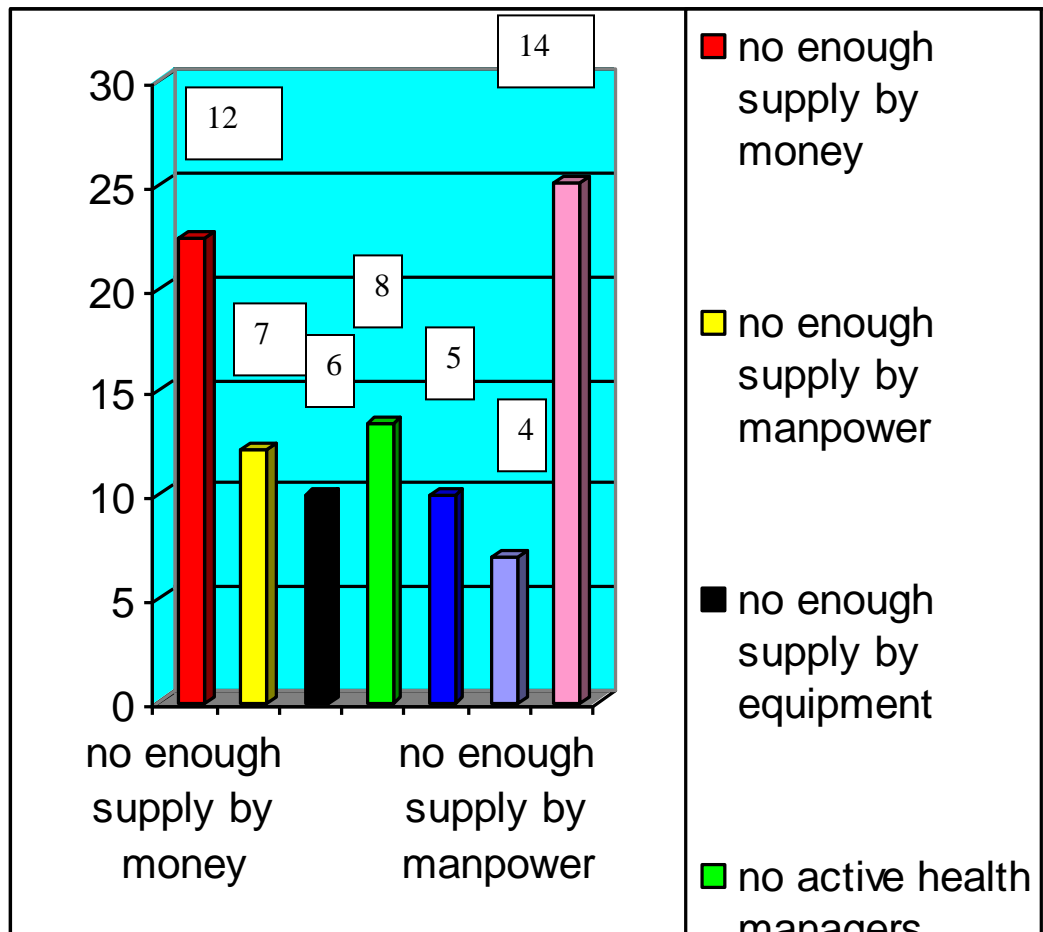
The problems in the health facilities are, (23%) no enough supply by money, (12%) no enough supply by manpower, (10%) no enough supply by equipment, (14%) no active health managers, (8%) no continuous training, (7%) no enough supply by manpower & equipment, and (25%) others, as in the above figure.

Table (37): shows the health facilities barriers according to the type of the health facilities.

N=56

Barriers	Types of the health facilities			Total
	Basic health units & dispensaries	Health centres	Rural hospitals	
No active h. managers	1	4	1	6
Shortage in equipments	3	4	1	8
Shortage in manpower	2	6	1	9
No continuous training	1	4	1	6
No enough supply by money	2	7	2	11
Poor coordination	-	2	-	2
Poor community participation	1	5	1	7
No active health managers & lack of continuous training	1	-	-	1
Shortage in supply by money, shortage in equipment, & shortage in man power	2	4	-	6
Total	13	36	7	56

Table (38): shows the sort of problems, which face the health workers.

N=209

Problems	frequency	Percent
No active h. Leaders	37	17.7
Missing of understanding by health leaders	19	9
No management skills	20	9.6
No continuous training	66	31.6
No enough supply by money	21	10.1
No enough supply by equipment	13	6.2
No continuous training & no enough supply by money	15	7.1
No management skills & missing of understanding by health leaders	11	5.3
Others	7	3.4
Total	209	100

Figure (16): shows the barriers, which face the users in the health facilities.

N=384
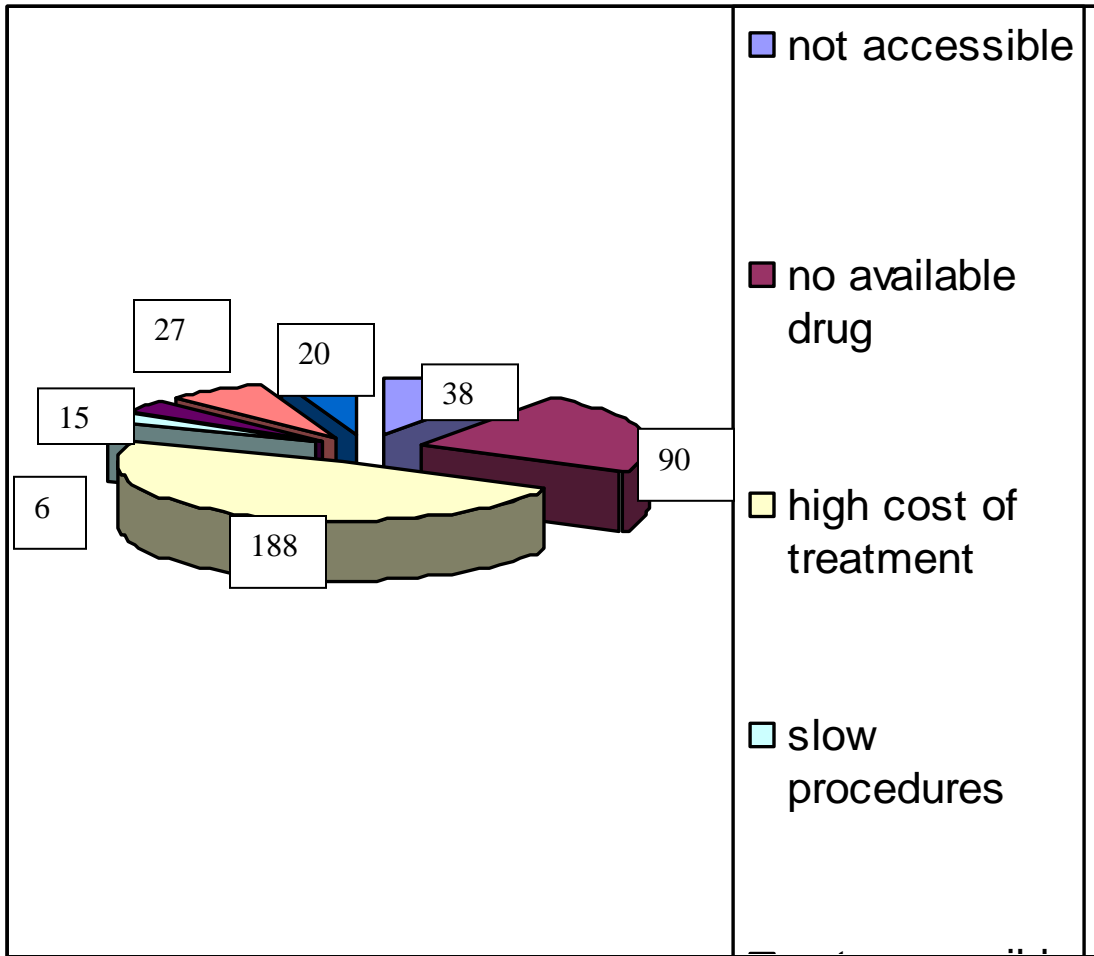
The barriers which face the users in the health facilities are, (9.8%) not accessible, (23.5%) no available drug, (48.9%) high cost of treatment, (1.5%) slow procedures, (4%) not accessible & no available drug, (7%) no available drug & high cost of treatment, and (5.3%) others, as in the above figure.

Table (39): shows the users suggestions to improve the health facilities.

N=384

Variables	Frequency	Percent
Provides by enough supply (money, manpower, and equipment)	108	28.1
More continuous training	27	7.1
Availability of the drug	77	20.1
Decrease of treatment cost	56	14.6
Establish new health facilities in the area	40	10.4
Establish new health facilities in the area & Decrease of treatment cost	36	9.3
Provides by enough supply (money, manpower, and equipment) & More continuous training	32	8.3
Others	8	2.1
Total	384	100

4.2- Qualitative results:

- No health council in the locality, the existing body is services committee.
- There is a health team, but now not active.
- Some villages have health committees, & some have not.
- No sister in the health centres.
- No sociologists in the health facilities.

4.2.1- Results of focus group discussion of the community leaders:

- Most of the community leaders define decentralization, as a distribution of responsibilities.
- Health authority delegates responsibilities from up level to lower one.
- Most of the community leaders define health area system, as a cover of people by health services.

- Community leaders are organizing community by dividing it to committees.

- Health programs and health problems solution come from the community.

- Health system participates with community leaders in, (planning, implementation and evaluation) of the health programs.

- Their assessment of public support of the health facilities is poor.

- One of the health problems facing the local health system is the poor supply by money, equipment, & manpower.

- They suggested that, health facilities should have enough supply by money, equipment, & manpower to improve the health area system.

4.2.2- Results of interviewing with the managers of Shendi teaching hospital & Al-mak Nimir university hospital:

- The two hospitals, give curative services to the community and PHC services as MCH, and vaccination, in addition to training for medical students & health workers.
- No day for the specialist doctors in the villages of the locality.
- The two hospitals do not refer back some of the referral cases to their health facilities in the locality for follow up.
- They suggest that, health facilities in the locality should have enough supply by money, equipment, & manpower to improve the health area system.

4.2.3- Results of health related sectors:

- Most of the managers of the health related sectors think that there is good coordination in implementation of prevention program between their sectors and health sector.
- They suggest establishing a committee from all the health related sectors and health sectors to improve the coordination in the related programs and activities, especially in planning, implementation and exchange of experiences.

Chapter (5)

Discussion:

5.1- Coverage & accessibility:

The study shows that (9%) of the health facilities are basic health units, (14%) are dispensaries, (64%) are health centres and (12%) are rural hospitals, figure (2), and this indicates that all the types of health facilities are exist in Shendi locality. However, health centers are more than other health facilities, & they play main role in health area system. This result agrees with, [10], & [12], "Sudan started to give health services, (basic health unit, health centre and rural hospital), in rural areas to be near people. In addition, health centers are often the first contact the community has with the formal health system and most of the district level health workers are based there, health centers should be equipped to function as the focal point for comprehensive PHC.

It was found that (8%) of the areas with out any type of health facilities, figure (1), and this agrees with [8], [28], [5], [12], [37], "there is lack of health services in some areas and unnecessary duplication in other". Moreover, health facilities are not accessible for (9%) of the community, figure (3), this result disagrees with, [8], [28], [5], [38], [37], & [38], "it is envisaged that by the year 2000, at least essential health care should be accessible to all individuals and families in an acceptable and affordable way, with their full participation".

(73.3%) of the managers of the health system think that health facilities are not equitably distributed in areas of the locality as in table, (8). This indicates that people are not covered by the health facilities in some areas in the locality as mentioned by, [28], [8], [12], [37], "health services must be shared equitably by all people whatever their ability to pay, and all (rich or poor) must have access to health services. This has been termed as social justice".

5.2- Knowledge of the HAS:

(33.3%) of managers of the health system define health area system as a cover of community by health facilities, figure (6), this result is the same with , [10], "a health area system is based on primary health care. It serves a well-defined population living within a clearly delineated administrative and geographical area".

Community leaders define decentralization as distribution of responsibilities & delegation of authority. In addition, that delegation should come from upper to lower. This result is the same with definition of [3], [15], & [4], "decentralization defined in general terms as a process of transfer of power, responsibilities and resources from the higher level of government to the lower level or levels".

5.3- Availability of resources at HAS level:

The over all supply (money, manpower, and equipment) for the health facilities is not enough (73.4%), figure (8), (77%) of the health facilities have no good supply for allocated budget, table (17), and (55.1%) of the health workers think that the health facilities are not provided by enough manpower, table (16). In addition, the public support is not good as community leaders think, and adequate and stable levels of staffing and

essential supplies need good performance. So state health authorities should encourage all the levels to make maximum use of resources available locally. This result disagrees with, [12], [10], [37], & [47],

(21.5%) of the health workers in health facilities are medical assistants, figure (5). This result agrees with, [10], "Many training centres started to train health workers (medical assistants, health supporters, midwives and health visitors) in Sudan".

The level of acceptance of the health workers performance is good (70%), figure (14). Although (46.9%) of them have continuous training course for one time, figure (11), this result disagrees with, [25], "the objective of the health ministry institutions is training and rehabilitation the health workers".

5.4- Management of HAS:

There is supervision done by the managers of health for the health facilities, (77%), figure (9). The highest tool of supervision that used is visiting and monthly reports (70%), figure (10), this mentioned by, [12], "Visiting the work place by the leaders and supervisors of the worker has a big effect to establish good relationship between the leaders and the workers. Moreover, it is kind of support create confidence and increase the abilities of the workers".

Coordination between health sector and health related sectors in prevention programs & health activities is good. This result mentioned by, [12], &, [8], "there is an increasing realization of the fact that the components of primary health care can't be provided by the health sector alone, the declaration of Alma – Ata states that primary health care involves in addition to health sector, all related sectors and aspects of national and community development, food, industry, education, housing, public works,

communication and others".

There is no health council in the locality, this is not mentioned by, [12], "the health council discuss the health team plans to improve the health services in the area and give the political support".

There is a health team in the locality; this agrees with, [12], "Any health area has health team from the different health fields. In addition, the health team must be the link between the health ministry and the local community. Health team has to plan, implement and evaluate the local health services". However, now the existing health team is not active or without activities.

5.5- community participation:

(23.3%) of the community participation is, figure (13). (72.7%) of the community in the locality are not participated in health activities, figure (12), this result disagrees with, [28], [8], [25], & [47], "in addition to the health sector, families and communities need to get actively involved in taking care of their own health. There must be continuous effort to secure meaningful involvement of the community in the planning. Implementation and maintenance of health services. In short primary health care must be built on the principle of community participation (or involvement)". Moreover, (11.5%) of the community is not satisfied of the serves provided by the health facilities to them, table (33). (48.3%) of the problems which face the users is the high cost of the treatment, Figure (16).

No statistical significant relation between community participation and sex, education & social status of the users of the health facilities, because P-value is more than 0.05. However, the study found statistical significant relation between community participation and the age, because P-value is less than 0.05.

5.6- Conclusion:

A descriptive cross-sectional community & facility - based study was carried out in Shendi locality-River Nile State, Sudan between September, 2007 – April, 2010, to evaluate the application of health area system, & estimate the coverage by the health services. Finally, the conclusions of this study are the following:

- No health council in the locality.

- There is a health team but now is without activities or not active.

- Some villages have health committees and some have not.

- Health facilities of health area system are not distributed in areas equitably.

- Types of health facilities present in the locality are rural hospitals (12%), (65%) are health centres, (14%) are dispensaries and (9%) are basic health units.

- (8%) of the areas in the locality wth out any type of health facilities.

- There is regular supervision runs on the health facilities, (77%), by the managers of health.

- Visiting & monthly reports are the major tools used than the others supervision tools, (70%).

- (22.4%) of the barriers that face the health area system is lack of enough supply by money for the health facilities.

- Continuous training is one of the most common problems facing the health workers, (31.6%).

- Large number of the users of the health facility complains of the highest cost of treatment, (48.3%).

- (72.7%) of the users of the health facility do not participate in health programs.

- There is statistical significant relation between community participation & age of the users of the health facilities.

- (23.3%) of the community participation is in planning.

- Coordination in implementation of prevention programs between health sector and health related sectors is good.

- Most of the community leaders define decentralization as distribution of responsibilities.

- Shendi teaching hospital and Elmak Nimir university hospital have no role in participation of specialist doctors at the level of locality villages.

- Some people of the community are not satisfied of the services, which are provided by the health facilities to them.

5.7- Finally, we can conclude that, the application of HAS in Shendi locality is not applied as it planned, because of the following:

1- No health council

2- Health team is not deal with his functions

3- Some villages have not village health committee

4- Poor of supply of Allocated budget, manpower, and equipment

5- Rural hospitals are not play their role in HAS, & this of the replacing of the doctors and health workers

6- No clear boundaries of the administrative units

5.8- Recommendations:

- Managers of HAS in the locality to be applied well, managers of health have to modify the model of HAS administrative structure to the below one:

```
                    ┌─────────────────────┐
                    │   Health council    │
                    └─────────────────────┘
                               │
                               ▼
              ┌──────────────────────────────┐
              │        Health team           │
              └──────────────────────────────┘
                               │
                               ▼
          ┌──────────────────────────────────────┐
          │      Village health committee        │
          └──────────────────────────────────────┘
```
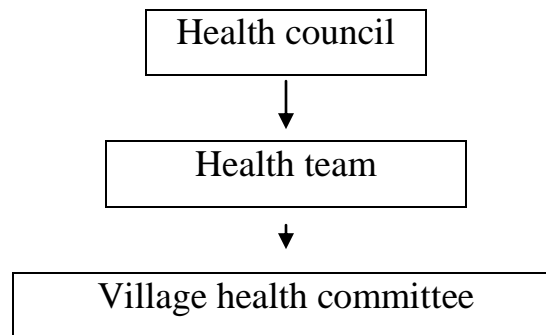
In addition, they have to establish the catchments areas around the health centres in the locality instead of rural hospitals and they have to establish the village health committees (VHC) in the villages with out one.

- Managers of health system to distribute equitably, cover people in the locality by the health facilities, & health facilities to be accessible, they have establish health facilities on scientific way and on real studies according to the community needs & the size of the population to improve the health of the community.

- Managers of health system to eliminate the barrier of lack of enough supply of money, manpower, and equipment for the health facilities, they have encourage participation of people in health programs, by organizing the community to committees, and making each committee responsible of specific tasks.

- Local directors of health programs, to become current and skillful, & improve their performance in the health fields, they have train health

workers by establishing continuous training courses. That can be with coordination with the federal, state health ministry and Shendi University.

- Shendi teaching hospital and Al-mak Nimir university hospital, to play more active role in the health area system, they have identify days for specialize services in the villages in the locality, to treat medical problems in the area, and reasonable for able cost to the people.

- Managers of health system they has establish more health centres in the areas, which with out one to improve their health, because health centers in the locality play important factor in the health in the villages.

- State health ministry should increase the number of mid-level health workers (medical assistants, health visitors, nurses and lab. Technicians), and provide heath facilities in the locality by public health officers as a part of the preventive service to improve the environmental health in the villages.

Chapter (6)
References & appendix

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6.2- Appendix

6.2.1- Interpretation:

- Health Facilities: Health Facilities of Health Area System in Shendi locality (rural hospitals, health centres, dispensaries, & basic health units).

- Health Directors in the Health Ministry in the River Nile State: under secretary, director of PHC, director of curative medicine, director of preventive medicine, director of environmental health, director of health affairs, director of epidemiology, and director of school health.

- Directors of Health Program in Shendi locality: director of health affairs, director of PHC, health inspector, dispensaries inspector, director of immunization program, director of MCH program, director of nutrition program, director of school health, and director of health information.

- Health Programs Managers & HAMTs: Health Directors in the Health Ministry in the River Nile State & Directors of Health Program in Shendi locality.

- Health Team: Health Affairs Manager, Medical Manager of Shendi Teaching Hospital (doctor), Pharmacist or assistance pharmacist, Health Inspector (health officr), Dispensaries Inspector, Health Visitor, Statistic Manager, diarrhea and respiratory system coordinator, vaccination officer, and nutrition officer.

- Health Workers: All the Health Workers (doctors, medical assistants, sisters & nurses, techniques laboratory, pharmacists, midwives and health visitors, health officers, & statisticians) in the Health Facilities of HAS in Shendi locality, Except the Health Workers in Shendi Teaching Hospital and Almak-Nimir University Hospital were not included in the Study.

- Managers of Health Related Sectors: Directors of Agriculture, Irrigation, Education, Sport & Youths, & Informations.

- Managers of Shendi Teaching Hospital and Almak-Nimir University Hospital: Director General and Medical Manager of each Hospital.

- Community Leaders: Public Leaders & Managerial Officers in the Legislation Councils in the Locality.

- Community of Shendi Locality: The Users of the Health Facilities in Shendi Locality.

6.2.2- Questionnaires:
6.2.2.1-

بسم الله الرحمن الرحيم

Interviewing questions, (managers of the health system)

1- Age in years: a- less than 25 (..) b- 25-50 (..) c- more than 50 (..)

2- Academic certificate: a- secondary (..)   b- intermediate diploma (..) c- university (..)

3- Occupation: ……………………………………………………………..

 4- Period of working in health field in years: a- less than 5 (..)   b- 5-10 (..)   c- more than 10 (..)

5- Number of the training courses: a- less than 3 (..)   b- 3-6 (..)   c- more than 6 (..)

6- Reasons to adopt the health area system: a- no equitably of distribution of the health facilities (..)   b- poor coordination between health related sectors (..)   c- to active community participation (..)   d- others (..)

7- Which kind of health services presented: a- Curative (..) b- Preventive (..) c- promotive (..)   d- rehabilitative (..)

8- What is concept of health area system?.....................................

9- Number of population cover by the HAS facilities? a-less tan 5000 ( ) b- 5000-10000 ( ) c- 10001-15000 ( ) d- more than 15000

10- Is the health facilities equitably distributed in areas of the locality: a- yes (..)   b- no (..)   c- not know (..)

11- Is the overall supply (money, manpower, and equipment) of the health system, enough to the health facilities: a- yes (.) b- no (.) c- some times (..)   d- not know (..)

12- Is the supply by money for the allocate budget of the health system, enough to the health facilities: a- yes (..)   b- no (..)   c- some times (..) d- not know (..)

13- Is the overall supply by manpower of the health system, enough to the health facilities: a- yes (..) b- no (..) c- some times (..) d- not know (..)

14- Is the overall supply by equipment of the health system, enough to the health facilities: a- yes (..) b- no (..) c- some times (..) d- not know (..)

15- What is concept of health system decentralization: a- delegation of authority (..) b- equitably distribution of health facilities (..) c-others (..)

16- Do the community participates in the health programs: : a- yes (..) b- no (..)   c- some times (..)   d- not know (..)

17- If yes in which field: a- in planning (..)   b- in implementation (..)   c- in evaluation (..)   d- in supply by money & equipment (..)   e- others (..)

18- Are the primary health care services provided by enough equipment: : a- yes (..)   b- no (..)   c- some times (..)   d- not know (..)

19- Is there regular supervision on the locality health system?
a- yes (..)   b- no (..)   c- some times (..)   d- not know (..)

20- How supervision is run?
a- visiting (..)   b- reports (..)   c- check lists (..)   d- others (..)

21- If the answer by reports, when they are run?
a- weekly (..)   b- monthly (..)   c- yearly (..)

22- Do you know the community based initiatives policy system?
a- yes (..)   b- no (..)

23- Do you prefer applying the community based initiatives policy system in the future in the locality? a- yes (..) b- no (..)   c- not know (..)

24- If yes what sort of community based initiatives system may be applied? a- healthy village (..) b- healthy city (..)   c- others (..)

25- Is there continuous training for the health workers?

a- yes (..)   b- no (..)   c- not know (..)

26- Is there health council in the locality? a- yes (.) b- no (.) c- not know (.)

27- Has the health council the following delegations? a- health policies (..)   b- health planning (..)   c- health legislations (..)   d- others (..)

28- Is there health team in the locality? a- yes (.) b- no (.) c- not know (..)

29- Has the health team the following delegations? a- to coordinate health work (..)   b- to solve health problems (..)   c- to manage health services (..)   d- to know the community and to active his participation (..) e- to put the local planning (..)   f- others (..)

30- Is there coordination with health related sectors in the prevention programs? a- yes (..) b- no (..) c- some times (..)   d- not know (..)

31- If yes, what sort of coordination? a- exchange of experiences (..)   b- sharing coordination for activities (..)   c- Just in health emergencies (..) d- in implementation (..) e- in planning (..) f- others (..)

32- Is there referral system in the health services in the locality?

a- yes (..) b- no (..) c- some times (..)   d- not know (..)

33- How is the level of the acceptance of the health workers performance in the locality? A- excellent (..)   b- good (..)   c- bad (..)

34- What are the barriers of application of health area system in the locality? A- no active health leaders (..)   b- short in equipments (..)   c- no continuous training (..)   d- supply by money (..)   e- poor coordination (..)   f- supply by manpower (..)   g- others (..)

6.2.2.2-

Questions for focus groups discussion, (Leaders of the community)

1- What is the concept of decentralization?

2- Is the health facilities equitably distributed in the locality?

3- How is the health authority delegated in the locality of Shendi?

4- What is the concept of the health area system?

5- Do the health facilities cover the entire locality?

6- How is Shendi locality community organized?

7- Is there health committees in the villages of locality of Shendi?

8- Do the health programs and health problem solution come from the community of Shendi locality?

9- What is assessment of public support and supply for the health services in the locality?

10- What is community participation in the health programs?

11- Do the health system in the locality give chance to others to participate in, (planning, implementation and evaluation) of the health programs?

12- What are your suggestions, which may improve the health system in the locality?

6.2.2.3-

بسم الله الرحمن الرحيم

Interviewing questions, (managers of Shendi teaching hospital & Elmak-Nimir university hospital)

1- Which kind of health services is available in this hospital?

2- What is the role of this hospital in this area?

3- Is there a day in the villages of the locality for the specialist doctors services?

4- Is training in this hospital is just for the medical students & health sciences students?

5- Does this hospital receive the referral cases from the different health services in the locality?

6- Does the referral cases have the priority of the waiting cases in this hospital?

7- Does this hospital refer back some of the referraled cases to their health facilities for follow up in the locality?

8- Does this hospital give the following primary health care services?

- Referral & receiver services?

- Training?

- referral specialist clinics?

- Mother & child health?

- Vaccination?

- Environmental health?

9- What are your suggestions, which may improve the health system in the locality?

6.2.2.4-

<div dir="rtl">بسم الله الرحمن الرحيم</div>

Questionnaire for the health facilities

1- Type of the health facilities? a- basic health unit ( ) b- dispensary ( )
c- health centre ( ) d- rural hospital ( )

2- Place of the health service?   a- Shendi city ( ) b- rural of Shendi ( ) c-
Kaposhia ( ) d- Hajer-elasal ( )

3- Number of population? a-less tan 5000 ( ) b- 5000-10000 ( ) c- 10001-
15000 ( ) d- more than 15000

4- Number of health workers in the health facility?..................................

5- Kind of health workers - medical specialize? a- yes (..)   b- no (..)

- Medical house officer? a- yes (..)   b- no (..)

- Medical assistant? a- yes (..)   b- no (..)

- Socialist? a- yes (..)   b- no (..)

- Sister? a- yes (..)   b- no (..)

- Nurse? a- yes (..)   b- no (..)

- Midwife? a- yes (..)   b- no (..)

- health visitor? a- yes (..)   b- no (..)

- Pharmacist? a- yes (..)   b- no (..)

- yes (..)   b- no (..)

- Lab. Technician? a- yes (..)   b- no (..)

6- Is the allocate budget supply? a- enough (..)   b- intermediate (..) c-
not enough ( )

7- Is the supply by manpower? a- enough (..)   b- intermediate (..) c- not
enough ( )

8- Is the supply by equipment? a- enough (..) b- intermediate (..) c- not enough ( )

9- Is there regular supervision on the health services? a- yes (..) b- no (..) c- some times ( )

10- Methods of supervision? a- visiting ( ) b- reports ( ) c- chick list ( ) d- visiting & reports ( ) e- others ( )

11- Time of reports? a- weekly ( ) b- monthly ( ) c- yearly ( ) d- others ( )

12- Does the health facility trains the health workers? a- yes (..) b- no (..) c- some times ( )

13- Sort of training? a- basic ( ) b- continuous ( )

14- Are there referral services? a- yes (..) b- no (..) c- some times ( )

15- What are the health facility problems? a- no enough supply by (money, manpower, and equipment) ( ) b- no active leaders ( ) c- no training ( ) d- other ( )

6.2.2.5-

بسم الله الرحمن الرحيم

Visiting check list to the health services

1- Name of health facility:……………………………………..

2- Place of health facility: ………………………………………….

3- Type of health facility: a- basic health unit (..)   b- dispensary ( )

c- health centre (..)   c- rural hospital (..)

4- Is the health facility easy to reach: a- yes (..) b- no (.) c- some time (..)

5-How is the building situation of the health service: a- excellent (..)   b-

good (..)   c- bad (..)

6- Number of beds in the health facility?....................................

7- Any comments or observations: ……………………………….

6.2.2.6-

بسم الله الرحمن الرحيم

Questionnaire to the health workers

1- Name: …………………………………………………………………..

2- Sex: a- male (..) b- female (..)

3- Age: ……………………………………………………………….

4- Occupation: …………………………………………………………

5- Academic certificate: …………………………………………………

6- Period of working: ………………………………………………….

7- Do you have any course training during the work: a- yes (..)   b- no (..)

8- number of course training: …………………………………………

9- Is the health unit provided by enough money for allocated budget: a-yes (..)   b- no (..)

10- Is the health unit provided by enough manpower: a- yes (..)   b- no (..)

11- Is the health unit provided by enough equipments: a- yes (..)   b- no (..)

12- How is supervision runs to health unit: a- visiting ( ) b- monthly reports ( ) c- chick list ( ) d- visiting and reports ( ) e-others ( )

13- Is there regular supervision visiting: a- yes (..)   b- no (..)   c- some times (..)

14- What sort of problems face you in your work: ……………………

6.2.2.7-

بسم الله الرحمن الرحيم

Questionnaire to the users of the health facilities

1- Name: ……………………………………………………….

2- Sex: a- male (..) b- female (..)

3- Age: ……………………………………………………….

4- Education: …………………………………………………

5- Occupation: ………………………………………………

6- Is there any health unit in the area: a- yes (..)   b- no (..)

7- If no where is a nearest health unit: ………………………………

8- Is the health facility accessible: a- yes (..)   b- no (..)   c- some times (..)

9- How do you reach the health service: a- on foot (..) b- on animal (..) c- on car (..) d- other (..)

10- If you are ill, where do you go to curate: ………………………

11- Do you accepted the service provided by the health facility: a- I agree (..) b- I do not agree (..) c- some times (..)

12- What are the barriers which face you in the health facility: ………

13- Do you participate in any activity provided by the health facility: a- yes (..)   b- no (..)   c- some times (..)

14- Your suggestions to improve the health service: ………………… ……………………………………………………………………

6.2.2.8-

<div align="center">بسم الله الرحمن الرحيم</div>

Interviewing questions, (Health related sectors)

1- Is there any relationship between your sector and the health sector?

   3- Is there any coordination between your sector activities and programs and the health sector?

4- If yes, to what extent?

5- If no, what is the reason?

6- What are your suggestions to improve coordination between your sector activities and health sector?..

…………………………………………………………………………

6.2.3- Alma Ata, the Kazakh Soviet Socialist Republic (now Kazakhstan). 6-12 September 1978:

The International Conference on Primary Health Care, meeting in Alma-Ata this twelfth day of September in the year Nineteen hundred and seventy-eight, expressing the need for urgent action by all governments, all health and development workers, and the world community to protect and promote the health of all the people of the world, hereby makes the following Declaration:

50006.   The Conference strongly reaffirms that health, which is a state of complete physical, mental and social wellbeing, and not merely the absence of disease or infirmity, is a fundamental human right and that the attainment of the highest possible level of health is a most important world-wide social goal whose realization requires the action of many other social and economic sectors in addition to the health sector.

50007.   The existing gross inequality in the health status of the people particularly between developed and developing countries as well as within countries is politically, socially and economically unacceptable and is, therefore, of common concern to all countries.

50008.   Economic and social development, based on a New International Economic Order, is of basic importance to the fullest attainment of health for all and to the reduction of the gap between the health status of the developing and developed countries. The promotion and protection of the health of the people is essential to sustained economic and social development and contributes to a better quality of life and to world

peace.

50009.   The people have the right and duty to participate individually and collectively in the planning and implementation of their health care.

50010.   Governments have a responsibility for the health of their people which can be fulfilled only by the provision of adequate health and social measures. A main social target of governments, international organizations and the whole world community in the coming decades should be the attainment by all peoples of the world by the year 2000 of a level of health that will permit them to lead a socially and economically productive life. Primary health care is the key to attaining this target as part of development in the spirit of social justice.

50011.   Primary health care is essential health care based on practical, scientifically sound and socially acceptable methods and technology made universally accessible to individuals and families in the community through their full participation and at a cost that the community and country can afford to maintain at every stage of their development in the spirit of self-reliance and self-determination. It forms an integral part both of the country's health system, of which it is the central function and main focus, and of the overall social and economic development of the community. It is the first level of contact of individuals, the family and community with the national health system bringing health care as close as possible to where

people live and work, and constitutes the first element of a continuing health care process.

50012.   Primary health care:

50021.   Reflects and evolves from the economic conditions and sociocultural and political characteristics of the country and its communities and is based on the application of the relevant results of social, biomedical and health services research and public health experience;

50022.   Addresses the main health problems in the community, providing promotive, preventive, curative and rehabilitative services accordingly;

50023.   Includes at least: education concerning prevailing health problems and the methods of preventing and controlling them; promotion of food supply and proper nutrition; an adequate supply of safe water and basic sanitation; maternal and child health care, including family planning; immunization against the major infectious diseases; prevention and control of locally endemic diseases; appropriate treatment of common diseases and injuries; and provision of essential drugs;

50024.   Involves, in addition to the health sector, all related sectors and aspects of national and community development, in particular agriculture, animal husbandry, food, industry, education, housing, public works, communications and other sectors; and demands the coordinated efforts of all those sectors;

50025.   Requires and promotes maximum community and individual self-reliance and participation in the planning, organization, operation and control of primary health care, making fullest use of local, national and other available resources; and to this end develops through appropriate education the ability of communities to participate;

50026.   Should be sustained by integrated, functional and mutually supportive referral systems, leading to the progressive improvement of comprehensive health care for all, and giving priority to those most in need;

50027.   Relies, at local and referral levels, on health workers, including physicians, nurses, midwives, auxiliaries and community workers as applicable, as well as traditional practitioners as needed, suitably trained socially and technically to work as a health team and to respond to the expressed health needs of the community.

50036. All governments should formulate national policies, strategies and plans of action to launch and sustain primary health care as part of a comprehensive national health system and in coordination with other sectors. To this end, it will be necessary to exercise political will, to mobilize the country's resources and to use available external resources rationally.

50037. All countries should cooperate in a spirit of partnership and service to ensure primary health care for all people since the attainment of health by people in any one country directly concerns and benefits every other country. In this context the joint WHO/UNICEF report on primary health care constitutes a solid basis for the further development and operation of primary health care throughout the world.

50038. An acceptable level of health for all the people of the world by the year 2000 can be attained through a fuller and better use of the world's resources, a considerable part of which is now spent on armaments and military conflicts. A genuine policy of independence, peace, détente and disarmament could and should release additional resources that could well be devoted to peaceful aims and in particular to the acceleration of social and economic development of which primary health care, as an essential part, should be allotted its proper share.

The International Conference on Primary Health Care calls for urgent and effective national and international action to develop and implement primary health care throughout the world and particularly in developing countries in a spirit of technical cooperation and in keeping with a New International Economic Order. It urges governments, WHO and UNICEF, and other international organizations, as well as multilateral and bilateral agencies, non-governmental organizations, funding agencies, all health workers and the whole world community to support national and international commitment to primary health care and to channel increased technical and financial support to it, particularly in developing countries. The Conference calls on all the aforementioned to collaborate in introducing, developing and maintaining primary health care in accordance with the spirit and content of this Declaration, (8).

جامعة شندي
كلية الدراسات العليا

تقييم نظام المنطقة الصحية بمحلية شندي, سبتمبر, 2007 – ابريل, 2010.

اطروحة قدمت لنيل درجة الدكتوراة في الصحة العامة

لجنة الامتحان

المشرف: برفسير/ عبدالغفار علي ادم
الممتحن الخارجي: بروفسير/ عبدالله الرحمن كباش
الممتحن الداخلي: د/ عبدالحفيظ عثمان
الباحث/ سليمان الكامل احمد

التاريخ: 6.1.2011

اناس ساعدو الباحث

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- ا/ احمد عبدالباقي
- ا/ حجازي محمد احمد
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- طلاب الدبلوم الوسيط في التمريض الفصل الثالث (حجر العسل – الحوش)

الاحصاء والتحليل:
- د/ حسين (كلية العلوم والتقانة)
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6.2.4- photos of some health services in Shendi locality:

6.2.5- Map of Shendi locality (study area):