

COST OF TRAINING NURSES IN ETHIOPIA

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Cost of Training Nurses in Ethiopia

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## ABSTRACT

In manpower training, as in any other area, efficient uses of resources is always desirable since it is one of the most important determining factors. Simultaneously, quality of the training should also be given due consideration in parallel with that of efficiency. The promising or effective outcome of training of nurses obviously is not different. Out of the five schools for the training of nurses in the country, the Centralized School of Nursing of Addis Ababa and the Nursing School of Asmara are studied. Choice of these schools is based on convenience and feasibility for the study.

The main concern of the study is to estimate the cost of training nurses in Ethiopia based on the experiences of the two schools of nursing. The study also covers the effect of attrition on the cost of training & the staff - student ratios during 1973 - 1977 E.C.

The study shows that, on the average the Centralized School of Nursing spends Birr 2145.35 per student per year while the Asmara Nursing School spends Birr 1306.44 per student per year. The average total cost per student from enrollment up to graduation at the Centralized School of Nursing is Birr 6233.12 while at Asmara School of Nursing it is Birr 3686.00.

An average attrition rate of students of 20.4% per year at the Centralized School of Nursing and 15.5% per year at Asmara Nursing School is observed based on studying three consecutive batches in both schools. Attrition has shown a statistically significant effect on the cost of the training in both schools.

If there were not any attrition of students, the mean cost would be reduced by 27.5% for the Centralized School of Nursing and by 19% for the Asmara Nursing School.

Cost per student per year and cost per trained student between the two schools were also compared. And it was found out that the Centralized School of Nursing spends significantly more in both aspects. (  $P < 0.0005$  ).

The Asmara Nursing School has staff-student ratio with an annual average of 1:20 and ranging from 1:13 to 1:24. The Centralized School of Nursing has an average staff-student ratio of 1:13, ranging from 1:10 to 1:15. In both cases only the teaching staff are considered for calculating staff-student ratios.

Recommendations are made based on the findings of the study.

# 1. I N T R O D U C T I O N

## 1.1. THE IMPORTANCE OF MAN POWER TRAINING

IN

### HEALTH SERVICE DEVELOPMENT

Trained man power is one of the most important resources of the health service system. Its role in the health service is quite evident. The medical care and preventive services require health facilities and health man power, without which one can only face empty health institutions and decaying water supply installations (1). Thus the importance of trained health man-power can not be over emphasized. In trying to produce the health man-power needed in a country, a number of factors to be considered include the type of health problem in the specific society and resources the country can afford to train the health man-power. Therefore, a study of the cost of training health man-power becomes an important area of research. It becomes even more important when one finds that such studies are lacking in our situation. In a study done about 15 years ago, it was stated that cost of training a nurse at Asmara Nursing School was about Birr 9,00 ( about Birr 2,000 per student per year). This was done when the school was training nurses for four years . In order to arrive at this the annual budget of the school was divided by the number of students and multiplied by four. Then Birr, 1,000 was added as an estimated cost for buildings and other facilities(2). Since the main concern of that study was not cost of training, the figures indicated are not results of thorough investigation but only estimates made on passing. When this study is attempted, it is not without the understanding that scarcity of previous studies in this sector would cause numerous obstacles in terms of conventional methodology and reasonable comparison.

A study conducted in 1962 on the " Cost of Higher Education in Africa" for instance, included only the training cost of physicians and not of other health professionals (including nurses) (3).

#### 1.2 A Hint About The History of The Nursing Profession

The period around 324 A.D. marks the earliest period of systematic training of nurses (4). In this document, it is stated that Maricella, a rich lady in Rome, turned her palace into a monastery for women and at this very place a matron by the name of Fabiola founded the first free public hospital. Her close friend Paula, took the part of organizing and training nurses in the hospital who later continued to train nurses in Jerusalem. This practice then flourished throughout Europe following 324 A.D. Later around the eighth century, important figures by the names Hrotswitha, Lisba, Walburga and Berthgythe appeared in the picture of nurse training who went from Ireland to Germany and surrounding places and trained the women who, in addition to other duties, carried on hospital nursing and much medical work(5). Up until this time both the nursing practice and the training were closely related to religious purposes. Infact, the main reason was religion rather than health service. Around the end of the eighth century people like St. Francis reformed the training of nurses to a more democratic trend and in this way religious domination started to loosen both in the training and in the practice. The Roman Catholic concept of frequent washing as an antireligious practice and should not be advocated in nursing practice was fading off from this time onwards . But it must be born in mind that religion is one important factor which contributed to the expansion of nursing practice and training throughout the world.

The training of nurses based on scientific concepts, also termed as "Modern Nursing" by Lavinia L. Dock, started with its founder Florence Nightingale ( 1820 - 1910 ). Florence Nightingale is widely known as a practitioner, organizer and writer in modern nursing. This era marks a prominent departure of the monasteries from the profession of nursing. Later, Florence Nightingale systematized nursing in the British army (5). She created the School of Nursing at St. Thomas hospital in 1860. This is the land mark between modern nursing and traditional methods. The English speaking countries like Canada, Australia and South Africa followed her system of training and organizing nursing.

Another important factor which contributed to the expansion of nursing is the Red Cross influence after its creation in 1864. This organization initiated the establishment of training institutions in many countries including Ethiopia.

Colonization is also another factor which influenced the introduction of the nursing profession to many countries. Cuba and Porto Rico were influenced by the Americans and Mexico by Spain. In South Africa, the Nightingale system of nursing practice took-over at about the same time that it was developing in the United States, due to the strong ties South Africa had with England (5). Around the year 1920 Egypt had a school of nursing carried on by an English matron with a staff of English sisters.

### 1.3. Nursing in Ethiopia

In 1866 Swedish missionary nurses came to Ethiopia and worked in and around Massawa. In 1895 an expatriate midwife was practising mid-wifery in Harar (7). Before the Fascist Italian invasion, missionaries in Ethiopia started to train mid-wives and auxiliaries in the different health institutions of the region of Eritrea(7). Between 1939 and 1949, three Ethiopian nurses, trained abroad, were practising nursing in the country (7). In 1950, five students were recruited and sent to the British Hospital in Uganda to be trained in nursing (7). In 1949, the Red-Cross School of Nursing was opened in Addis Ababa and after  $3\frac{1}{2}$  years, eight nurses graduated from this first nursing school in the country (6). In 1950, Princess Tsehai Memorial Nursing School was established. In this same school, training of mid-wives started in 1959 and four students graduated in 1960. In 1951, Nekemt School of Nursing was started by Swedish missionaries.

The Gondar Public Health College was started in 1954, and produced fifteen community nurses in 1958. In 1955 Asmara Nursing School was started with 25 students and 13 of them graduated in 1959 after  $3\frac{1}{2}$  years of training (7). Until 1965, this school had student attrition rate of 35%, which later was reduced to 15%. For the last 31 years Asmara Nursing School produced 783 nurses. The present intake of this school is about 70 students per year. The Jimma Nursing School was established in 1983 with an intake of 120 students per year(11).

In 1972, Princess Tsehai Nursing School moved to a newly constructed building in the premises of Tikur Anbessa Hospital. The yearly intake of this new school was planned to be 72 students (8). St. Pauls Nursing School was built in 1972, with planned yearly intake of 140 students (9).

Within this same year Zawditu Nursing School got a new building by the Norwegian Mission, in the campus of Zawditu Hospital. The yearly intake of this school is 100 students at present (10). Eventhough the initial plan was to take 40 students per year. These three schools in Addis Ababa were brought under one administration by the name of "Centralized School of Nursing" and each was made to function as branch school. The branches are headed by branch heads with other staff members. At present, in Addis Ababa, there is one School of Nursing - The Centralized School of Nursing. Usually, first year students are accommodated at Zawditu, second year students at St. Paul's and third year students at Tikur Anbessa. Budget, facilities and personnel administration is completely centralized. From 1977 to 1986, the school produced 1,027 nurses. It is estimated that at present there are about 2,500 nurses working in the country (2). And there are five schools for the training of nurses.

Whereas the Gondar Nursing School is under Addis Ababa University, the other four nursing schools are under the Ministry of Health. Yearly intake of students ranges from 70 ( Asmara Nursing School) to 140 (Cnetralized School of Nursing). Students with passes in the Ethiopian School Leaving Certificate examination and who manage to pass the entrance examinations are admitted to the nursing schools. Training takes  $2\frac{1}{2}$  years in all schools except the Jimma Nursing School(2years). Admission policy and curriculum are set by the Ministry of Health for all schools. Thus, the quality of the training is quite comparable, except for Jimma Nursing School.

In Jimma Nursing School some courses like physical diagnosis are omitted; this resulting in a reduction to the period of training. The main reason for ommission of courses in Jimma Nursing School is that as

the number of physician graduates increases and health centers staffed with physicians, the role of the nurses will be restricted only in the nursing sector. That is, the role of examining patients and diagnosing diseases will be assigned to physicians. Ofcourse the other reason is to meet the present demand of nurses with the shortest possible time. At present, all the nursing schools are functioning at full or over capacity in relation to facilities.

#### 1.4 Future Trend

According to the Ten Year Development Plan, ( 1984 to 1993 ) an additional 3,660 nurses are required. To achieve this target, the following measures shall be taken by the Ministry of Health. (11 )

- a. New nursing schools will be opened in Asella and Harar with a yearly intake of 100 students each.
- b. Asmara Nursing School will increase its yearly intake from 70 to 80 students.
- c. The Centralized School of Nursing will increase its yearly intake from 140 to 160 students with improved building, dormitory and classroom facilities.
- d. The staff-student ratio will be improved to 1:10.
- e. Measures will also be taken to improve the quality of tutors, in terms of academic standard through inservice training.

### 1.5 THE PURPOSE OF STUDYING COST OF TRAINING

The following are the basic issues for studying the cost of training:-

1. Resources are one of the most important determining factors in the training of man-power.
2. Though, degree of shortage varies from country to country, it is agreed that there are shortages of these resources in most countries ( developing countries in particular ).
3. Therefore, efficiency in training is always desired. On the other hand due consideration must be given to the quality of the training which is related to that of efficiency.
4. Based on the findings, alternatives can be sought to improve the situation.

### WHY CHOOSE THE NURSING SECTOR

1. Out of about 12,000 health professionals presently working in the country ( excluding community health agents and traditional birth attendants) 2,500 (21%) are nurses (12). This category is the second largest in number next to that of the health assistants.
2. Nurses in this country function as polyvalent health workers ( 13). They work as health center managers, pharmacists and involved in examining and treating patients in many health institutions.
3. They work in almost all health institutions, at the head quarter level with managerial capacity, in hospitals, specialized institutions, health centers and health stations.

In short this category is large in number, involved in polyvalent activity and highly distributed over all health institutions. This makes the profession very important and worth study the cost of its training.

#### 1.6. Objectives of the study

The general objective of the study is to estimate the cost of training nurses in Ethiopia.

##### SPECIFIC OBJECTIVES:-

1. To find out the cost of training of a nurse for the  $2\frac{1}{2}$  academic years in Ethiopia.
2. To find out the impact of attrition on the cost of the training.
3. To compare cost variations between the two schools ( Centralized School of Nursing - Addis Ababa and Asmara Nursing School - Asmara ).

## 2. METHODS AND MATERIALS

### 2.1 Places of Study

As stated earlier, there are five schools for the training of nurses in the country. Out of these, the Centralized School of Nursing and Asmara Nursing School are chosen for this study for the following reasons:-

1. Gondar and Jimma Nursing Schools are within the Addis Ababa University, that is Gondar College of Medical Sciences and Jimma Institute of Health Sciences respectively. Both of these schools train other categories of health workers like physicians, sanitarians and laboratory technicians. As a result, to exclude costs involved in the training of nurses alone from the other categories is difficult.
2. Nekemt School of Nursing was interrupted and resumed in 1979. And few years following the resumption may not be taken as a effective period for the school and to include it in the study may invite bias.
3. The remaining are the nursing schools of Asmara and the Centralized School of Nursing and these are the units for this study.

The Centralized School of Nursing is situated in Addis Ababa whereas Asmara Nursing School is in Asmara, the main city of Eriterea Administrative Region. Description of these schools is made earlier in the Introduction part.

## 2.2. Study Population

The study period covers the years 1973 - 1977 Ethiopian fiscal year ( 1980/81 - 1984/85 G.C. ) . In such studies, the longer the years covered, the more preferable it is, but considering simplicity and convenience on one hand and validity on the other, shorter periods ( as short as one year ) ( 14. ) can be taken if stability of the institutions is assured and longer periods are preferred otherwise. From the view of the above points, a period of five years is taken.

Documents of the schools are used to find out both the staff and student population for the study period. The student and staff population of each year for the study period was further considered. Information on those who could not promote to the next classes in each batch was also examined. Based on the data attrition rate of students is obtained. In this undertaking the staff to student ratio for each year was also calculated, taking into account the teaching and non-teaching staff separately. For the staff to student ratio, only the number of the teaching staff is included. The attrition rate calculated and the batches followed from enrollment to graduation is only for three years period ( 1973 - 1975 E.C. inclusive ).

\* - By teaching staff is meant those staff members involved in class-room and/or practical teaching sessions.

## 2.3. Types of Data Collected on Cost and Method Used

2.3.1. Recurrent Cost - By recurrent cost we mean salary and cost of all consumable items like fuel, stationery items, student stipend, cost for water, electricity and telephone. The cost of these items for the study period for each fiscal year was collected from the documents of the schools. This is utilized and not just allocated budget, as there are sometimes differences between the two. Salary and other recurrent costs are registered separately for each year. To make these values comparable, implicit inflation rate of 3.6% per year is taken (15), and for each year recurrent cost is converted to 1986 constant Birr. Then recurrent cost comparison is made for each year.

2.3.2. Capital costs - These included buildings, vehicles, books medical instruments and furniture. Under furniture, we have office furniture, dormitory facilities, kitchen utensils and other equipment.

3.2.1. Buildings - The cost of buildings of the schools is estimated by experienced engineers from Ethiopian Building Construction Authority in Asmara and Addis Ababa University. These costs are calculated in current ( 1986 ) price as new buildings.

3.2.2. Economic life of buildings - Francois Orivel from World Health Organization - Geneva (14) suggests 40 years as the economic life of a building. The National Committee for Central Planning estimates the depreciation rate of buildings as 5% per year. In the latter case the total economic life of the buildings will come to about 30 years. Nevertheless we see some buildings which are even older than 40 years and still functioning. Taking into consideration of more shortage of resources to build new ones in developing countries, it is logical to assume that the economic life of buildings is much more in our situation.

Supported by the above views and points, for this study, the economic life of buildings is taken as 50 years. The total cost of buildings for each institution is divided by 50, one-fiftieth of the cost being as an annual cost of buildings for each institution. It is to be noted that the longer the economic life of facilities the more the cost of maintenance. Therefore, cost of maintenance is also included when ever feasible and possible.

3.2.3. Vehicles - The original cost of the vehicles for the schools is obtained from the schools and in some cases from the companies importing the vehicles. The National Committee for Central Planning recommends depreciation rate for vehicles as 20% per year ( 15 ). In this case the economic life comes to about 8 years. Francois Orivel suggests a suggests a range of 5 to 15 years as the economic life of vehicles (14). The nursing schools under study are situated in big towns with asphalted roads with relatively smooth situation for the vehicles contributing to their longer life. And in real life situations we see private cars running for the last 30 years. In trying to come to an average, 15 years is taken as the economic life of vehicles in this study. The original cost of vehicles in each institution is divided by 15.

3.2.4 Furniture:- This category consists of quite a wide variety of items, including chairs, tables, beds, radio and television sets, refrigerators, kitchen utensils, telephone sets, cupboards.

Both in Addis Ababa and in Asmara, present market prices of these items were collected in consultation with government and private firms and shops. All the furnitures available and in use since 1980 were registered with the help of workers in the schools. Information as to when these items were bought, granted or made was also documented. Based on the depreciation rate from the National Committee for Central Planning

( 15 ) and the comment from Francois Orivel (4), the economic life of furniture for this study is taken as 15 years. The estimated cost of each item was calculated. The total cost for each institution was divided by 15, to get the cost of furniture for one year.

2.3.2.4. Medical instruments - Various types of medical instruments and teaching materials are used for teaching purposes in the schools. A list of all these materials is prepared. The present cost of each item is estimated by the Office for Pharmaceutical Services of the Ministry of Health. The economic life for this category is taken as 15 years. The basis for this estimate is again information from the National Committee for Central Planning (15), and suggestion from Francois Orivel(14). The total cost of all medical instruments is divided by 15 years to get the yearly cost for the study period.

2.3.2.5. Books - List of all the books in the schools is prepared with the help of the librarians and other staff of the schools. The current cost of each book is prepared. Sources are Asmara City Bookshop and the Sounders Inventory of Books.

Assuming that all books available in the libraries contributed directly or indirectly to the make up of nurses, no distinction has been attempted between "Professional" and "Non-professional" books, because the boundary between the two is not always easy to demarcate. Concerning the economic life of books different agencies were consulted; including Addis Ababa University main library (16,17).

According to these sources, ( when considering depreciation ) books can be divided into three categories. These are:-

- a. books which depreciate regularly - these are mainly the classical text books.

- b. books which stay without depreciating - these are historical documents.
- c. books which appreciate, rather than depreciating - these are books like the Bible, the Koran and the works of Shekspeare and others.

Most of the above types of books , with varying numbers are available in the schools.

Recent editions of text books are preferred to that of earlier ones. But to qcqui a more and more recent editions depends on the financial strength of the institutions.

In developed countries where there are financially strong institutions, for especially classical text books, three years is taken as the optimal useful life of books (17). Some books (non-textbooks) have much longer useful life. Since we are dealing with schools of nursing in a developing country, it is logical to assume more years as useful life of books than those in developed ountries. Infact, during data collection, we saw many textbooks published in the 1960s and still in use. Taking all the above points into account, 10 years is taken as the useful life of books. Total cost of books in each school, divided by 10 years was taken as the yearly cost of books for the training.

It must be understood that in studies of such types, a method that will enable us- to arrive at a perfect figure cannot be envisaged. The purpose should rather be, and it is in this case, to have an intelligent " estimate". Our preise follows Samuel~~roft~~s conclusion that " Mistakes in depreciation will ultimately come out in the wash any way" (17).

Out of about six methods of depreciation available\* the " Straight-Line Depreciation" method is applied here (18).

Scrap Value - is not considered here because of inavailability of standards and as usual, " Scrap values come out in a wash finally" (18), meaning that their significance in the total work can be found to be diminished.

The sum of these capital cost is distributed into each year of the study period ( 1986 constant Birr ) so that common values can be compared during analysis.

The total capital and recurrent cost for each year is divided by the total number of students in each year. This gives us the expense per student for each year in constant Birr (18). Those enrolled in 1980, 1981 and 1982 (1973,1974 and 1975 E.C. ) are followed for  $2\frac{1}{2}$  years ( from enrollment to graduation) to find out the cost incurred on each trained nurse.

Those who failed to pass to the next classes and finally those who did not succeed to graduate are also followed up in each group. The cost involved with and without these students is analysed to see the effect of attrition on the cost to the training.

\* Types of Depreciation Methods are:-

- |                               |                          |
|-------------------------------|--------------------------|
| 1. Straight Line Method       | 4. Annuity Method        |
| 2. Declining Balance Method   | 5. Production Method and |
| 3. Sum-of-Years Digits Method | 6. Revenue Method.       |

### 3. FINDINGS

#### 3.1 Study Population

The annual average number of students at the Centralized School of Nursing was 368 and that of the staff ( both teaching and nonteaching ) was 126. The annual average number of teaching staff was 29. This makes the staff-student ratio 1:13 for the study period.

Asmara Nursing School has a yearly average of 182 students and 37 staff members ( both teaching and non-teaching ). The yearly average number of teaching staff is 9, giving a staff-student ratio of 1:20 for the study period. Total distribution of students and staff members for the five years is shown in table I.

During the five year period, a total of 700 students were admitted to the Centralized School of Nursing and a total of 620 students graduated. Asmara Nursing School admitted 348 students and graduated 263 during the same five year period.

Those admitted in 1973, 1974 and 1975 E.C. are followed for  $2\frac{1}{2}$  years and attrition was observed. Centralized School of Nursing experienced an average attrition rate of 20.1% per year while that for Asmara Nursing School was 15.5% per year. The highest attrition rate (26.9%) in the Centralized School of Nursing was seen in 1977 E.C. as can be seen in Table II. The final year students refused to sit for national practical examination and as a result, many students were delayed

Table I Distribution Of Staff and Students In Years

Year E.C.	Centralized School of Nursing				Asmara Nursing School			
	Students	Staff members		Staff- Student ratio	Students	Staff members		Staff- Student ratio
		Teaching	Non - Teaching			Teaching	Non- Teaching	
1973	311	31	97	1:10	160	12	27	1:13
1974	354	31	96	1:11	174	9	31	1:19
1975	407	32	96	1:13	190	8	27	1:24
1976	400	28	100	1:14	187	6	27	1:31
1977	368	24	96	1:15	197	10	27	1:20
Average	368	29	97	1:13	182	9	28	1:20

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Table II Admissions and Attritions

Year E.C.	Centralized of Nursing				Asmara Nursing School			
	Admission	Graduates	Attrition		Admission	Graduates	Attrition	
			Number	%			Number	%
1973	150	82	-*	-	71	44	-	-
1974	147	79	-	-	67	44	-	-
1975	160	122	28	18.7	69	58	13	18.3
1976	145	125	22	15.0	71	58	9	13.4
1977	98	117	43	26.9	70	59	10	14.4
Total	700	620	93	-	348	226	32	-
Average	140	124	31	20.4	69.6	45.2	10.6	15.5

\* To calculate the attrition for the 1973 and 1974 graduates, the 1971 and 1972 E.C. admissions should be known but this information is not in the study because it is out of the study period.

### 3.2. Recurrent Costs

The Centralized School of Nursing spent a total of Birr 2,502,549.26 as recurrent cost during the study period, out of which Birr 1,669,200.36 ( 66.7%) is spent for salary. Concerning relative increase or decrease in each year, say from 1973 to 1974 E.C. there is an increase of 9.1% and from 1974 to 1975 E.C. there is an increase by 3.0%. In 1976 E.C. cost decreased by 8.8% and again in 1977 E.C. there is a decrease of 4.9%. The average annual change in the study period is a decrease of 0.3% . These costs in each year are compared in 1986 constant Birr. The annual average recurrent cost in this school is Birr 500,509.85.

Asmara Nursing School spent a total of Birr 900,884.23 in the five years period out of which Birr 454,045 ( 50.4%) is spent for salary, so that the annual average cost is Birr 180,176.85. From 1973 to 1974 E.C. these cost decreased by 6.7% and in 1975 E.C. a decrease of 17.7%, in 1976 E.C. a decrease of 9.2% and in 1977 E.C. there is an increase of 2.5%. The annual average changes for the five years period is a decrease by 6.22%

The distribution of recurrent costs in the schools is shown in table III.

If we try to see as to how much is spent for teaching staff and how much for non-teaching staff, we find that the Centralized School of Nursing spent Birr 808,072.73 (53.31%) for teaching staff and Birr 707,774.40 (46.69%) for the non-teaching staff for the study period.

Table III Recurrent Cost in Years in Birr For the Two Schools

Year (S.C)	Centralized School of Nursing					Asmara School of Nursing				
	Salary	%	Running Cost	Total	Constant Birr	Salary	%	Running Cost	Total	Constant Birr
1973	262822.00	64.5	143812.12	406634.62	479839.47	82840.00	44.6	102726.00	185566.00	218987.68
1974	294212.37	64.2	163295.70	457508.07	523389.23	75946.32	42.5	102726.00	178672.32	204401.13
1975	329396.00	66.7	157251.50	486647.50	539205.43	86280.00	56.9	65495.63	151775.63	168167.40
1976	328818.10	71.6	130143.25	458961.35	492006.57	76984.00	54.0	65495.63	142479.63	192738.16
1977	300598.76	66.5	151244.94	451843.20	468109.56	65672.00	56.7	65495.63	151167.63	156609.66
5years										
Total	1515847.13	-	745757.01	2261603.74	2502550.26	407722.32	-	401938.89	809672.21	908884.23

Asmara Nursing School pays a total of Birr 407,722.32 for salary and out of this Birr 211,050.42 ( 51.76%) for the teaching staff and Birr 197,672.00(48.24%) for the non-teaching staff.

Breakdowns of salary in each year is presented in table IV.

### 3.3. Capital Costs

As stated in the section on methods and materials, five groups of items, namely, buildings, vehicles, furniture, books and medical instruments are included in this category.

3.3.1. Buildings - As stated in the introduction part of this paper, the Centralized School of Nursing comprises of the Tikur Anbessa, Paulos and Zewditu branch schools.

3.3.1.1 Tikur Anbessa - building was completed in 1972 and started functioning in the same year. It is a one block building with three floors, with a total area of 1,555.98 square meters. The cost of this building was estimated to be Birr 1,867,176.00.

3.3.1.2 Paulos building - is situated in the compound of St. Paulos Hospital at the north west corner of the city. It was completed in 1975 and started functioning in the same year. This building has also three floors. It has a total floor area of 4,449.37 sq. meters and the present cost is estimated to be Birr 5,339,244.00.

3.3.1.3 Zawditu - branch school building is built in 1972. It has a floor area of 1,362.58 sq. meters and an estimate current cost of Birr 1,635,104.00.

Table IV. Salary Distribution In Respect To Teaching & Non-Teaching

Year (S.C)	Centralized School of Nursing			Asmara Nursing School			Total
	Teaching Number	Non-teaching Number	Total	Teaching Number	Non-teaching Number	Total	
1973	146724.00	116073.00	262822.00	42440.00	39400.00	81840.00	
1974	160250.67	123964.76	294212.27	56546.32	35400.00	91946.32	
1975	132346.80	145049.20	293306.00	47840.00	39440.00	87280.00	
1976	175244.00	152574.50	328221.50	36992.10	39392.00	76934.10	
1977	142307.26	158291.00	300598.26	46232.00	39440.00	85672.00	
Total	608072.73	707774.40	1515847.13	211050.42	177672.00	407722.42	
Average	161614.55	141554.88	303169.43	42210.08	39534.40	81744.48	

\* Turnover of teaching staff at the Asmara Nursing School was very high, with variation both in number and in salary between the years.

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3.3.14 Asmara Nursing School - building has three blocks. The total floor area of the buildings comes to 1,901.12 sq. meters and their cost is estimated to be Birr 1,572,296.00.

3.3.2 Vehicles - The Centralized School of Nursing has a total of eleven cars all of which are currently functioning. They were obtained at different times. They include a bus with 50 seats, a Renault 14 automobile and other vehicles. The total cost of these vehicles is about Birr 570,000.00. This cost was divided by 15 and the yearly cost is Birr 37,333.33 from 1973 to 1975 E.C. and Birr 38,000,000 in 1976 and 1977 E.C.

Asmara Nursing School at present uses two vehicles. One of the vehicles has served for 15 years and the other for only two. Total estimate cost of the vehicles is Birr 53,000.00, with a yearly cost of Birr 8,000.00 until 1976 E.C. and 3,533.33 thereafter.

### 3.3.3 Furniture

Numerous items are included in this category as mentioned earlier. At the Centralized School of Nursing 160 items are registered in this category. Costs of all these items were estimated to a total of Birr 744,319.96. Out of these items costing Birr 3,550 were purchased in 1974 E.C. and all the rest were bought before 1973 E.C.

Asmara Nursing School has 114 items of furniture with a total cost of Birr 301,657.25. The total cost of furniture is divided by 15 years to get their yearly cost. No purchase of furniture was done between the years of 1973 to 1977 E.C. A great majority of the furniture were received in 1965 E.C. from " Kagnev Station ".

3.3.4. Books

The Centralized School of Nursing has a total of 12,224 books and their distribution is as follows:-

Zawditu 5,443, Paulos - 3,908 and Tikur Anbessa - 2,875. The total cost of all these books comes to Birr 255,315.29. This cost is divided by 10 years to get the yearly cost of books and this amounts to Birr 25,531.53. Asmara Nursing School has a total of 5,330 books with a total cost of Birr 138,867.71. The yearly cost of books amounts to Birr 13,886.77.

3.3.5. Medical Instruments - Under these category medical instruments used as teaching aids are included. Mobile hospital beds with estimate cost of Birr 1,500 each are found in all schools and are included in this category, because they are used for teaching (demonstration) purposes. Distribution of medical instruments under the Centralized School of Nursing is as follows:-

Zawditu branch - 115 items, Paulos branch - 275 items and Tikur Anbessa branch 275 items. Total cost of medical instruments at the Centralized School of Nursing is estimated to be Birr 90,813.58. This divided by 15 years gives the yearly cost of medical instruments to Birr 6,054.24.

Asmara Nursing School has 68 items of medical instruments with a total cost of Birr 25,085.18. The total cost of medical instruments and related items at this school is divided by 15 years to get the yearly cost which is Birr 1,872.35.

As presented on table V, the yearly total capital costs for the Centralized School of Nursing averages to Birr 288,979.93 and Birr 57,073.41 for Asmara Nursing School.

Table 7 Capital Goods in Years in Current *Dir*

Year (1970)	CENTRALFIELD SCHOOL OF NURSING					Total
	Buildings	Vehicles	Furniture	Books	Medical Instruments	
1973	17008.40	3733.33	4039.40	2009.53	604.24	27794.90
1974	17008.40	3733.33	4039.40	2009.53	604.24	27794.90
1975	17008.40	3733.33	4039.40	2009.53	604.24	27794.90
1976	17008.40	3733.33	4039.40	2009.53	604.24	27794.90
1977	17008.40	3733.33	4039.40	2009.53	604.24	27794.90
Total	85042.00	18666.65	20197.00	10047.25	3020.56	134873.46

Year (1970)	ARIZONA NURSING SCHOOL					Total
	Buildings	Vehicles	Furniture	Books	Medical Instruments	
1973	31445.92	800.00	20110.48	13006.77	1072.25	55435.42
1974	31445.92	800.00	20110.48	13006.77	1072.25	55435.42
1975	31445.92	800.00	20110.48	13006.77	1072.25	55435.42
1976	31445.92	3533.33	20110.48	13006.77	1072.25	59168.75
1977	31445.92	3533.33	20110.48	13006.77	1072.25	59168.75
Total	157227.60	15900.00	80450.72	52033.58	5285.00	208587.90

...

The cost for buildings is the highest in both schools (Birr 8,520.220.00 for the Centralized School of Nursing and Birr 1,572.296.00 for Asmara Nursing School). The lowest cost in both schools in this category is for medical instruments which is Birr 90,813.53 for the Centralized School of Nursing and Birr 25,085.18 for Asmara Nursing School. This description is for the total of five years.

Normally, it is expected that total cost in any year should depend on the total number of students in that specific year. Therefore, as the total number of students increases, the total cost should increase for that year.

In this study, we do not see this pattern. Causes of this issue is discussed on chapter four. For further illustration, please see the graph on the next page.

All costs, capital and recurrent, for each school are summarized in table VI. Here, current Birr is changed to constant Birr to make comparisons possible.

Year	Centralized School of Nursing	Asmara Nursing School
1971	2,671	1,115
1972	2,671	1,115
1973	2,671	1,115
1974	2,671	1,115
1975	2,671	1,115

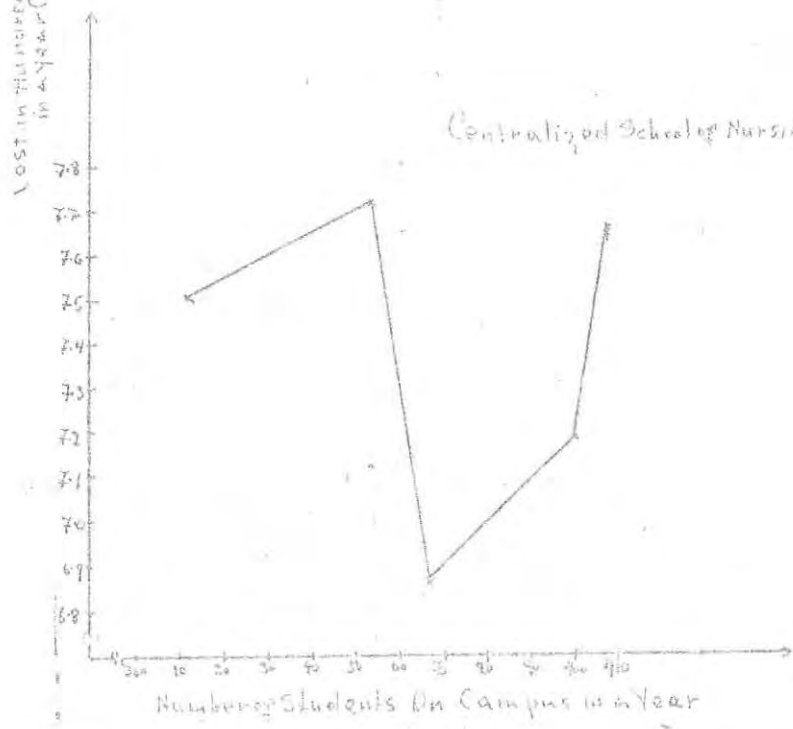
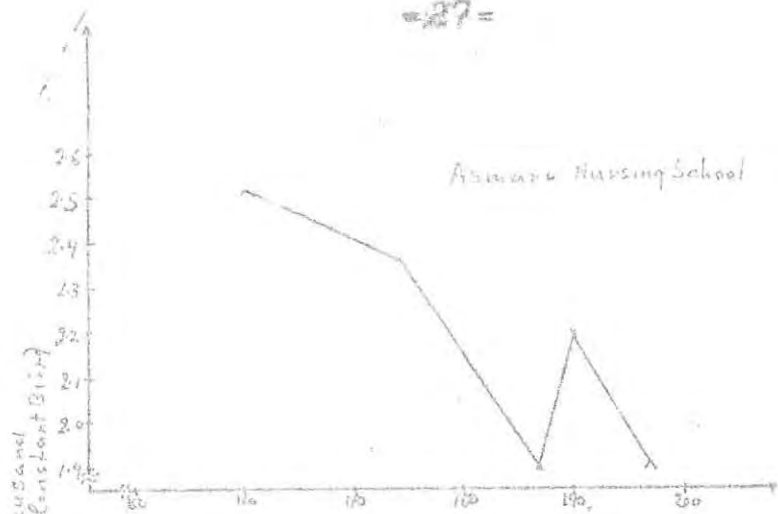


Fig. 1. The Relationship Between Annual Cost and Number of Students

Table VI - Total Expenditure in Constant Price

Year B.C.	Centralized School System			General District School		
	Recurrent	Capital	Total	Recurrent	Capital	Total
1973	470230.87	303771.50	766617.37	218967.89	55980.08	274947.96
1974	523533.37	230771.50	812157.12	204401.13	55980.08	260381.21
1975	533503.62	288771.50	827953.55	168167.40	55980.08	224147.48
1976	412706.77	239240.23	780947.20	152732.16	56713.41	209445.57
1977	475100.56	270616.50	781725.86	155609.66	56713.41	212323.07
Total	2579113.20	1411319.00	3990432.20	900864.83	281367.66	1182232.49
Total			3990432.20			2770504.96

### 3.4. Cost per student per year

The cost per student per year is obtained by dividing the total cost in each year by the number of students on campus in that specific year. Thus, in the five year period Centralized School of Nursing spent money that ranges between Birr 1952.37 to Birr 2,471.44 and Asmara Nursing School in the range of Birr 1,093.01 to Birr 1,718.42 per student per year. Maximum cost per student was seen in 1973 E.C. in both the schools and the minimum was in 1976 E.C. for Centralized School of Nursing and in 1977 E.C. for Asmara Nursing School.

Summary of cost per student per year is given in table VII.

### 3.5 COST PER GRADUATE NURSE AND THE EFFECT OF ATTRITION

Three batches of students in each school were studied to find out the cost for the whole course, that is, from the time of admission to graduation. The costs for those students who could not succeed to graduate were included in the study so that the effect of attrition on the cost of training could be shown. The three batches of students studied in each school are those enrolled to the schools in the years of 1973, 1974 and 1975 E.C. These students are followed up from the time of enrollment to the time of their graduation. Those who succeeded to graduate and those who could not were studied separately so that cost with attrition and cost without attrition could be shown.

The Centralized School of Nursing spends Birr 7009.92 per trained nurse for the batches enrolled in 1973 E.C., Birr 5708.59 for the batches enrolled in 1974 E.C., and Birr 5980.85 for the batches enrolled in 1975. All this cost included also the cost

on those students who could not succeed to graduate. Thus attrition is considered in the cost on this aspect. If the cost on only those students who succeeded to graduate is considered ( assuming that there wasn't any attrition) then the cost would be reduced like the following ( for the Centralized School of Nursing) - For the 1973 E.C. batch Birr 5701.40 for the 1974 E.C. batch Birr 4854.25 and for the 1975 E.C. batch Birr 4373.50

The difference between cost with attrition and without attrition is statistically significant (  $P < 0.005$  ). Thus, the effect of attrition on the cost of the training is significant.

Asmara Nursing School spends Birr 4318.89 for the batch of 1973 E.C. per student until graduation, Birr 3575.45 for the 1974 E.C. batches and Birr 3163.65 for the batches of 1975 E.C. If the cost for only those students who succeeded to graduate is considered ( separating attrition) then the cost per graduate nurse for the batch of 1973 E.C. would be lower to Birr 3528.10 for the 1974 E.C. batch Birr 3095.16 and Birr 2705.15 for the 1975 batch. Here again the effect of attrition on the cost is statistically significant.

The summary on the cost of the training with and without attrition is presented on table VI. The way it is calculated is as follows:-

1. On page 33, Table VII, the cost per student in the specific year is shown.

2. On page 17, Table I, the number of students on campus in the specific year is shown.
3. Total cost in the specific year is obtained by multiplying cost per student per year by the total number of students in the year.
4. This calculation is done for  $2\frac{1}{2}$  years to get the cost per graduation.
5. The total cost divided by only the number of graduates gives us cost per graduate. ( attrition considered ) , while total cost divided by the number of students originally enrolled gives us cost per graduate nurse without attrition.

Table VII Cost per Student per Year

Year	Generalized School of Nursing			Asmara Nursing School		
	Number of Students	Total Cost	Cost per student	Number of Students	Total cost	Cost per Student
1974	311	76847.37	2471.44	159	274947.56	1718.43
1974	354	812157.13	2294.25	172	263391.21	1480.14
1975	401	272931.33	2054.16	150	221447.48	1472.72
1975	400	740847.20	1982.57	131	211451.57	1612.76
1977	362	717725.56	2659.04	157	215321.07	1093.01
Total	1840	3947140.62		508	1182251.82	
Average	666	789433.18	2145.25	161	237250.26	1306.44
S.D.			20.30			23.53

Table VIII Summary of Cost in Fatchon & her Trained Nurses

Course	Centralized School of Nursing			Asmara Nursing School		
	Number of Students	Cost Per Student Per Year	Total Cost Per Year	Number of Students	Cost per Student Per Year	Total Cost Per Year
<u>Batch A (Enrolled in 1973 E.C.)</u>						
1st year	150	2471.44	370716.00	71	1778.42	122007.82
2nd year	128	2294.26	360398.08	63	1896.44	54275.72
3rd year	122	2034.36	248095.86	58	1179.73	34211.68
			<u>695210.04</u>			<u>270495.42</u>
		Cost per graduate	7009.92	Cost per graduate		4318.89
		(with attrition)		with attrition		
		Without "	5701.40	with out "		3528.10
<u>Batch B (Enrolled in 1974 E.C.)</u>						
1st year	147	2294.26	337256.22	67	1496.44	100261.48
2nd year	125	2034.36	254295.00	63	1179.72	74322.36
3rd year	125	1952.37	244046.25	58	1130.76	32792.04
			<u>715597.47</u>			<u>207375.88</u>
		Cost per graduate		cost per graduate		
		with attrition	5708.59	with attrition		3575.45
		with out "	4854.25	with out "		3095.16
<u>Batch C (Enrolled in 1975 N.C.)</u>						
1st year	160	2034.36	325497.60	69	1179.72	81400.68
2nd year	130	1952.37	253808.10	59	1130.76	66714.84
3rd year	117	2059.04	240907.68	59	1306.44	38539.98
			<u>620213.38</u>			<u>186655.50</u>
		Cost per graduate		Cost per graduate		
		with attrition	5980.85	with attrition		3163.65
		with out "	4373.50	with out "		2705.15
		Mean cost with		Mean cost with		
		attrition	4233.12	attrition		3686.00
		standard Deviation		Standard Deviation		
		with attrition	30.06	with attrition		27.03
		Mean cost without		Mean cost without		
		attrition	4876.38	attrition		3109.47
		Standard Deviation		Standard Deviation		
		without attrition	24.03	without attrition		21.59

#### 4. DISCUSSION

A number of variables included in the study of cost of training are number of years of training, number of students to be trained, the number of staff, the size and type of facilities and the attrition of students. Attrition of students is affected by factors such as the standard of basic education and admission policy to the training schools. In this aspect, since resource is restricted everywhere, ( both in the developed and developing countries) lower cost for training is desired. But the cost is to a great extent related to the quality of the training. In many developed countries today, nurses are trained at degree level because they could afford. In our situation nurses are trained at diploma level, not because degree is not needed but because our case demands for more efficiency because of more scarcity of resources. Therefore, we can conclude that socio-economic situations are determining factors in health manpower training.

In most cases, there are no standard requirements in training institutions, because it is not an easy issue to set one, since there are other variables to be considered. Standards for optimum level of attrition, acceptable staff-student ratio, student facilities are not available. One recommendation by UNESCO indicates that the student to books ratio at higher institutions of learning should be 1:70 (17) . This has been disputed by many authorities because other factors like financial strength of the institutions, and quality of the books should be considered.

There are five schools for the training of nurses in Ethiopia, located in five different administrative regions. The two schools chosen for this study are run by the Ministry of Health. The duration of training in both cases takes  $2\frac{1}{2}$  year with the same curriculum. The purposes which the trainees are prepared for is similar in the two schools. Admission policy and sources for these schools are virtually the same. Therefore, both the quality and the cost of the training is not expected to be different in these schools.

#### 4.1 Cost Per Graduate Nurse

The cost per graduate nurse varied from time to time and also between the two schools, even though assumed to be the same. It is evident that cost minimization is always desired, provided the quality of the training is not negatively affected. It is to be noted that one way of minimizing cost is by increasing the number of trainees. As far as the schools in this study are concerned, they seem to be functioning at well over capacity. Small libraries in the Centralized School of Nursing branches can only accommodate 15 to 32 students at a time, paradoxically however, they are currently serving about 100 students(20). Students are too many (125 to 150) for the class rooms existing currently.

#### 4.2 Staff-Student Ratio

Staff-student ratio is an other factor very much determining both the quality and the cost of the training. There is no acceptable standard as to what this ratio should be for the country, specially in the field of nursing training. Now, the Ministry of Health is planning to set a 1:10 staff to student ratio (11). This study shows that the staff to student ratio deteriorates from year to year in both schools. The Centralized

School of Nursing had a staff to student ratio ranging from 1:10 in 1973 E.C. to 1:15 in 1977 E.C. and that of Asmara Nursing School from 1:13 in 1973 E.C. to 1:20 in 1977 E.C. The reason for this is that the number of students in both the schools increases from year to year ( generally ) but the number of teaching staff remains constant or even decreases as in the case of the Asmara Nursing School. The Ministry of Health Planning to improve the ratio to 1:10 clearly indicates that the present staff-student ratio is below the recommended ratio. The lower the number of the teaching staff with constant or increasing number of students, the more likely it will have a negative effect on the quality of training, because better supervision and follow-up can only be achieved with less number of students per supervisor, calling for an increase in the number of teachers. Thus a balance should be worked out for an acceptable level between efficiency and effectiveness.

Therefore, from this study one can learn that improving efficiency by decreasing the number of teachers is unthinkable, because it is already below the acceptable limit.

By decreasing the duration of the training, one can decrease the cost of the training. But if we trace back the history of training of nurses in the country, until 1976, nurses were trained for a period of  $3\frac{1}{2}$  to 5 years (13). In 1976, the Ministry of Health revised the curriculum and decided to shorten the training to  $2\frac{1}{2}$  years. At present there is a prevailing view, on the part of the leadership and the staff of the two schools that shortening the period has contributed to a negative effect on the quality of the training. Therefore, trying to increase efficiency by further shortening the period of training will have

a severe effect on the quality of the training.

#### 4.3. Attrition of Students

- At national level, there is no standard for the optimum level of attrition rate of students of nursing, thus comparative analysis is not possible. But there is an overall view that attrition rate of students of nursing in the country should not be more than 15%.

The important fact to note here is that one way of improving efficiency is by decreasing attrition of students. This is one important area of intervention reflected in this study. Lower attrition rate can be achieved through improved basic education, by setting higher standard for admission to the training schools.(19), closer supervision and follow-up of students, through improved teaching methods and higher quality of teachers. Higher quality of teachers does not necessarily entail more cost in terms of benefits to the teachers.

The attrition rate of students at the Centralized School of Nursing shows an annual average of 20.4% and at Asmara Nursing School 15.5% . There was an abnormally high attrition rate of 26.9% at the Centralized School of Nursing in 1977 E.C. This was because the graduating students at this time were asked to sit for a final practical examination, which they refused. This resulted in a delay of many students.

#### 4.4. Cost Per Student Per Year

- During the study period, cost per student per year decreased from year to year in both the schools. The main reasons for this are as follows:-

1. The number of students increased from year to year while the budget did not show any increase.

2. The number of staff, particularly the teaching staff, did not increase with the number of students, infact it decreased on the average, in the case of Asmara Nursing School.
3. The other important factor which contributed to the decrease of cost per student per year in both the schools is the effect of inflation. The yearly decrease in cost per student per year would be even more, if higher rate of inflation is considered.

Cost per student per year varies between the two schools. The average cost per year at the Centralized School of Nursing being Birr 2145.35 and at the Asmara Nursing School Birr 1306.44

#### 4.5 Recurrent Cost

The total recurrent cost in both the schools shows a decreasing trend from year to year. This is particularly true when converting the cost into constant Birr (1986 ), by considering an inflation rate of 3.6% per year, recommended by the National Committee for Central Planning. Considering the situation in the world at large, it is possible to consider higher rate of inflation. Thus, if 5% inflation rate is considered ( which could still be conservative), then the yearly change of recurrent costs would show a different picture.

- a. Centralized School of Nursing:- Taking a 3.6% of annual inflation rate, the average annual recurrent cost decreased by 0.3% but if 5% per year inflation rate is considered, then the average annual cost will show a decrease by 0.4%. The 1973 E.C. recurrent cost in this school increased by 9.1% in 1974 E.C. with 3.6% inflation rate. But considering 5% inflation rate per year then the change will be an increase of 6.6%. In the same manner, if a 5% per year inflation rate

rate is considered, the 1975 E.C. recurrent cost compared to that of 1974 E.C., the change will be an increase by 2.2%. The 1977 E.C. cost decreased by 10.6% to that of 1976 E.C.

- b. Asmara Nursing School :- with 3.6% per year inflation rate the annual average change is a decrease by 6.2% but if 5% inflation rate is taken, then this will change to a decrease by 8.6% . The 1974 E.C cost will decrease by 9.3% with 5% inflation, and the 1975 E.C. budget compared to that of 1974 E.C. cost the change will be a decrease by 24.6%.

Therefore, in summary if 5% per year inflation rate is considered instead of 3.6%, then the recurrent cost will show a more decreasing trend from year to year. Thus, the higher the inflation rate assumed, the lower the recurrent cost. This analysis implies that the most important factor for the decrease is inflation. This is because of the fact that constant price is used instead of the current one for each year. If current price is used instead of the constant then for Centralized School showed an increase from 1973 to 1975 E.C. Asmara Nursing School showed a decrease even in current price from year to year. One reason for this is that, as can be seen from Table I, the number of teaching staff decreased from year to year, resulting in a decreased cost in salary.

#### 4.6. Capital Cost

- The capital cost for the five categories of items considered, namely, buildings, vehicles, furnitures, books and medical instruments is calculated on the bases of depreciation ( economic life) of the items. It is to be remembered that the economic life of buildings is regarded as 50 years. Fifty years might look too long for a building life,

but one of the blocks of Asmara Nursing School is over 40 years and is still in good condition, without incurring much cost of maintenance. Any way, buildings costed the highest in both the schools and if shorter than 50 years is taken as the economic life of buildings then the cost will even be higher. This is one reason why the more liberal economic life of 50 years is taken.

As stated earlier, there is no standardization as to the number and type of books that must be available in the schools. The number of books found in the Centralized School of Nursing is twice as much as that of the Asmara Nursing School. This is true not only to the number of books but to the cost of the books as well. The average annual number of students and the average annual number of staff (teaching) is also twice more in the Centralized School of Nursing than that of Asmara Nursing School. This finding might indicated that the books allocated in the schools is proportional to the capacity of the schools. But this is not so. It is only coincidental. Besides this, the books in the two schools are not all exactly of the same type.

A wide discrepancy is observed with regard to medical instruments both in number and cost. The Centralized School of Nursing has 665 items of medical instruments costing Birr 90,813.58, while Asmara Nursing School has only 68 items costing Birr 25,085.18 - a difference of about four fold. The three branches of the Centralized School of Nursing received these items when they were independent schools by their own so that not all of them are being used at present in each branch. This indicates a need for redistribution.

The eleven vehicles at the Centralized School of Nursing are not even considered enough for the present needs of the school ( and definitely they are not excess ) where-as the Asmara Nursing School with only two vehicles does not appear to need much more. This is mainly due to the scattered nature of the branches of the Centralized School of Nursing needing much more transportation.

As far as furniture is concerned, the numbers are comparable with the capacity of the schools taking the number of students and staff in the schools. Here again, question of standard and adequacy is still to be answered.

#### 4.7. Cost Comparison Between the Schools

The reasons why Asmara Nursing School spends less than the Centralized School of Nursing is examined in this discussion. Taking into consideration the sizes and capacities of the two schools, cost of buildings, vehicles and medical instruments are not proportional. The Centralized School of Nursing cost of buildings is Birr 8,520,220, cost of vehicles is Birr 570,000.00 and cost of medical instruments is Birr 90,813.58 while for the Asmara Nursing School cost of buildings is Birr 1,572,296.00, cost of vehicles is Birr 53,000.00 and cost of medical instruments is Birr 25,085.18. In all cases the difference is from about 4 to 8 fold. The Centralized School of Nursing uses eleven vehicles while Asmara Nursing School uses only two. The Centralized School of Nursing has three big buildings which are scattered throughout the city of Addis Ababa, necessitating enormous transport cost in terms of both vehicles, fuel, drivers and of cost maintenance. Therefore, we can see that all the buildings and all the vehicles of the

Centralized School of Nursing are needed at the situation the school is in. Infact, the school at present desires for more vehicles. The above points, including the one stated for medical instruments, are the main causes for higher cost on the part of the Centralized School of Nursing.

It is quite obvious that student nurses do give services at different capacities in health institutions as a requirement for practical training. Ideally, this cost should be deducted from the cost of the training. On the other hand, it is agreed in many studies that teaching institutions are found to expend more resources than non-teaching institutions (21). Reasons for this are many but to mention few would suffice here. A physician in a teaching hospital shares his time with students and as a result examines less number of patients. Thus, more physicians are required to perform the tasks. Facilities required in teaching institutions for training may not be needed for treating patients. Thus, invites more cost. Life of instruments and equipment in teaching institutions can be less than in non-teaching ones because " Students handle them". So costs to be added on the cost of the training and costs to be deducted from the cost of the training in this **respect** are quite likely to dilute each other.

The Ministry of Health at headquarters and at regional levels gives guidance and co-ordinates activities related to the training of nurses. But these costs cannot be sifted out for only the cost incurred in the training of nurses and in particular to the two nursing schools included in this study, since the Ministry of Health is involved in the training of all health professionals in the country, and further, there are five schools for the training of nurses in the country.

## 5. CONCLUSION AND RECOMMENDATIONS

### 5.1. Conclusion

The purpose of any health manpower training is to produce enough health workers to meet the situation (1). This means both efficiency and effectiveness are very important factors. The schools of nursing studied here are those for training nurses using the same curriculum for the same number of years of training and for the same purpose. This implies that there is no qualitative difference between the two schools.

Students at the Centralized School of Nursing get their practical training at the Tikur Anbessa Hospital which is a teaching hospital for both undergraduate medical students and residents. This might imply that the nurses receive better training, but the reality is that the hospital facilities including space are not enough for all the categories in the training. As a result, the nurse students get the minimum share of these facilities.

General conclusion that can be drawn from this study are the following -

1. Eventhough the quality of the nurses trained in these two schools is expected to be generally similar, this study reveals a strongly significant difference of cost per student per year and per graduate nurse between the two schools. It costs the government more to train nurses at the Centralized School of Nursing than at Asmara Nursing School, eventhough the reverse could have been expected.

Because of the various factors considered in the study , it can be assumed that while the cost of training nurses in the other nursing schools in Ethiopia would not be higher than that in the Centralized School of Nursing, it is possible that the cost would even be lower than in the Asmara Nursing School, specially in Gondar and Jimma where staff and facilities are shared with other categories.

The fact that there is no standard for comparison, the finding does not mean that it is necessarily the optimum.

2. The acceptable standard of staff to student ratio for schools of nursing in the country is not very clear. But, considering the future desire of the Ministry of Health, this study shows that the staff-student ratio in the two schools is below the acceptable level.
3. It is found that the attrition rate of students in the two schools is very high and this has definitely pushed the cost to be high. Therefore, all the other factors remaining the same, with improved standard of general education, improvement in the staffing, financing and admission policy of the nursing schools cost will go down.
4. It is expected that training institutions with higher number of students use more resources ( in terms of total annual cost) than those with smaller number of students, in the same type of training and under presumably the same situation. With the same token, it is also expected that in the same training institution, years with greater number of students show more total expenses. But in this study, this

issue is patternless. This shows that in the nursing schools, budgetary plans are not well considered with the number of yearly enrollment of students.

## 5.2 Recommendations

Based on this study, the following are points of recommendation.

1. The most contributing factor for the Centralized School of Nursing to spend more than the Asmara Nursing School is that it is administering three branches scattered throughout the city of Addis Ababa, thus requiring more transport facility in terms of vehicles, fuel, drivers and vehicle maintenance. On top of this, the three huge buildings by themselves are one cause for big cost of the school. One remedy for this issue is to bring all the branches to one campus. Again, this solution will demand suitable building and facilities, but once established, it will have low cost for the following years. Trying to make the three branches independent schools may even require more cost because each school will then require its own staff in every field of teaching and administration which currently are used in common between the three branches.
2. Since this study mainly concentrates on the cost of the training and since efficiency and effectiveness are strongly interrelated, further study involving quality of nurses trained is recommended. So that comparison would involve broader variables ( not only cost but effectiveness as well).

3. Very significant variation of cost between the two schools is observed in this study ( the Centralized School of Nursing spending more than Asmara Nursing School) both per student per year and per graduate nurse. One reason for variation of cost between the two schools is absence of standardization in terms of facilities. Therefore, setting standard facilities for the training institutions in the country is an important point of recommendation of this study.
4. It is found in the study that attrition resulted in a significantly high cost indicating that the present attrition rate is too high. Therefore, meanses must be designed to prevent attrition by improving general education,improving the admission policy of students, improving the supervision and follow-up in the training schools.
5. The staff to student ratio in both the schools is found to be too low. Therefore, it should be improved to the indication of the Ministry of Health or even better.

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REFERENCES

1. Barker, D.T . 1982, Health Planning - Qualitative Aspects and Quantitative Techniques.
2. Asfaw Desta... 1971, National Health Planning in Ethiopia - A Doctoral Thesis
3. UNESCO - 1962 - Conference on the Development of Higher Education in Africa.
4. Lavinia, L.D. - 1938 - A Short History of Nursing
5. Goodnow, R.N. - 1940 - Outlines of Nursing History
6. Ozanic , I - 1961 - Nursing in Ethiopia
7. Alganesh Haregot - 1967 - Asmara Nursing School, Report  
( unpublished)
8. Centralized School of Nursing - 1986-Official Document
9. St.Paulos Nursing School - June 1986 - Official Document
10. Mersha Tadesse - June 1986-Personal Communication
11. Kassa Roressa - June 1986 - Personal Communication
12. Central Planning Supreme Council - March 1984.  
The 10 Year Plan Preparation Task Force  
for the Health Sector - Ten-Year Perspective  
Plan (1985 - 1994) of Socialist Ethiopia.
13. Ministry of Health - 1980 Health Man-power Study Ethiopia
14. Francois Orivel - August 1985 - The Cost of Training Health Personnel, A Note on Methods
15. National Committee for Central Planning- Budget and Finance Department-1986 (Unpublished)

16. Yitateku Nega - May 1986 - Addis Ababa University  
Main Library - Personal Communication.
17. Getachew Biru - Sept. 1986 - Addis Ababa University Main  
Library - Personal Communication.
18. Samuelson, A.Paul - 1967 - Economics  
An Introductory Analysis
19. Bryant , J - 1969 Health care in Developing Countries
20. Mersha Tadesse - 1985 Centralized School of Nursing  
( Unpublished - Amharic )
21. Bryant, J. - 1969 - Economics of Medical Education,  
Health care in Developing Countries P.261.
22. National Committee for Central Planning - Macro  
Economic Planning Department - 1986  
( unpublished).

DECLARATION

I, the under signed, **declare** that the thesis is my original work and has not been presented for a degree in any University. All sources of material have been duly acknowledged.

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