Chapter 9
Challenges and Future Trends for Cancer Care in Egypt

Karima Elshamy

Introduction

Cancer is an increasing problem in Egypt. The commonest sites were liver (23.8 %), breast (15.4 %), and bladder (6.9 %) (both sexes): liver (33.6 %) and bladder (10.7 %) among men, and breast (32.0 %) and liver (13.5 %) among women. By 2050, a threefold increase in incident cancer relative to 2013 was estimated, these results based upon results of National Cancer Registry Program (NCRP) [1]. Egypt is expected to experience the highest increase in the coming two decades. Cancer is already an important health problem and will become increasingly important not only in terms of rank order, as infections are better controlled, but also in terms of incidence and mortality, which will both increase as populations continue to grow and age, and as risk factors for cancer associated with greater affluence continue to increase. At present, resources for cancer control in Egypt are not only inadequate but directed almost exclusively to treatment. This strategy, although successful to a degree, is suboptimal because the impact of preventive measures on incidence is not taken full advantage of, while the lack of approaches to earlier diagnosis reduces the value of therapy. The curability of cancer is directly related to its stage at the time of diagnosis, and in the majority of cancer is generally diagnosed when at a relatively advanced stage. According to WHO, 40 % of cancers could be avoided (prevention), 40 % could be cured (if detected early), and the rest should be managed with palliation. Prevention therefore offers the greatest public health potential and the most cost-effective long-term approach for cancer control [2].

K. Elshamy, D.N.Sc. (✉)
Medical Surgical Nursing Department, Faculty of Nursing,
Mansoura University, Mansoura, Egypt
e-mail: karima_elshamy2002@yahoo.com

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Egypt: Background Information

The Land and Geography: Egypt is located in the northeastern corner of Africa. Rectangular in shape, it covers an area of 386,000 mile^2. To the West lie the Western Desert and Libya, and the East is bordered by a desert plateau, Red Sea, Sinai, and Israel. The Sudan is on Egypt's southern border and to the North lies the Mediterranean. Egypt can be divided into The Eastern Desert, The Western Desert, and The Nile Valley.

The people: Population (2012 est.): 83,688,164 (growth rate: 1.92 %. Cairo, 10,902,000, Alexandria, 4,387,000; Giza, 2,597,600 and the country is divided into 26 governorates. Poverty has declined over the past few decades; however, there is disparity—poverty in Upper Egypt increased from 29 to 34 % in rural areas and from 11 to 19 % in urban areas. Although Egypt has experienced a rapid transition to lower fertility, Egypt is the second most populous country in the WHO Eastern Mediterranean Region, with 43 % of the population living in urban areas and overcrowded conditions. The Egyptians are outgoing, warm, and have a distinct sense of humor. They have respect and a liking for foreigners, and a deep sense of tolerance for other races, religions, and nationalities [3].

Language: Arabic is Egypt's official language. However, most Egyptians understand and speak English and French. In larger towns, the foreign visitor will encounter no difficulty in communicating with the people [4].

Religion: Approximately 85 % of the populations of Egypt are Moslems. Most of the balance, about nine million, is Christian Orthodox who belongs to the Coptic Church. In most cities in Egypt, mosques and churches can be found next to each other. There are also some synagogues since a small Jewish community still lives in Egypt [4].

Economy: Egypt is classified as a lower-middle-income country; however, characteristics of high-income, middle-income, and low-income countries coexist. Poverty has declined over the past few decades; however, there is disparity—poverty in Upper Egypt increased from 29 to 34 % in rural areas and from 11 to 19 % in urban areas [4].

The structure of the Egyptian Government is a democracy in transition, having recently elected a president; with all political authority is vested in the Government in Cairo [4].

The Egyptian health system: The health care system in Egypt is quite complex with a large number of public entities involved in the management, financing, and provision of care. Egypt's wide network of public (several ministries beside the military and police), NGO, faith-based charity organizations, and private health facilities allow good geographic accessibility and coverage. The Ministry of Health and Population is responsible for overall health and population policy as well as the provision of public health services, and is responsible for health insurance organization that provides services too. The Ministry of higher education is however responsible for health profession education (medical, nursing, dentistry, and pharmacy) and also runs university teaching hospitals. Public health expenditure is low and has pluralistic and complex financing mechanisms: tax-based financing, health insurance, and fee for service through out-of-pocket expenditures. To achieve universal coverage, Egypt is rolling out a new insurance scheme, currently being piloted in Suez Governorate, based on a "family physician model" which will separate financing from service provision. Despite Government's efforts for universal coverage, about half of total health expenditure comes from out-of-pocket (50 %) at the point of service in public and private facilities. Egypt produces over 90 % of the pharmaceuticals it consumes. Pharmaceuticals account for just over one-third of all health spending, of which approximately 85 % is private expenditure. Publicly produced medicines are heavily subsidized, which to a considerable extent accounts for their overuse [4, 5].

The Egyptian constitution enshrines free medical care as a basic right for all citizens, and though access to primary health care is fairly widespread, this ideal has yet to be fully realized. Vaccination rates, a good indicator of the access to basic health services, are high, and Egypt has also achieved some success in controlling communicable diseases. However, access to even basic services varies widely according to gender, region of residence, and socioeconomic status [4, 5].

The organization of the Egyptian health system is fairly complex. Public health care is highly centralized within the Ministry of Health and Population (MOHP),

though a number of other public entities are involved in managing and financing health care services. The most important of these are the Health Insurance Organization (HIO), which finances and provides services to almost half the population, and the Ministry of Higher Education (MOHE), which is responsible for medical education and some service delivery (i.e., in university hospitals). There is no overarching institutional oversight of all public entities involved in providing health services, limiting coordination between the various branches [4, 5].

Expenditure on health: is divided in the following manner: 36 % goes to pharmaceuticals, 19 % to services provided by the MOHP, 18 % to the private sector, 10 % to university hospitals, 8 % to services provided by the insurance system, 6 % to NGOs, and 3 % to other public institutions. Private insurance is fairly limited in Egypt, as premiums are low and companies find it hard to turn a profit. Recent reforms have de-regulated premiums, making the regulatory environment somewhat less restrictive, but still difficult to operate in [4, 5].

Magnitude of Cancer Care in Egypt

The Demographic Profile of Egypt

1. Population trends
   (a) *The population size of Egypt*
   Currently, Egypt is experiencing significant size, age structure changes that will have major implications for its socioeconomic development. The population size of Egypt increased from 44.9 million in 1980 to approximately 78.1 million in 2010. It is projected that in 2050, the population size of Egypt will reach approximately 121.8 million.
   (b) *Population growth in Egypt*
   The growth rate of the population of Egypt has been decreasing since the period 1980–1985, where it stood at 2.28 %. It reached 1.56 % in the period 1995–2000 and slightly increased afterwards to 1.68 % in the period 2005–2010. The population growth rate is expected to continue declining and will reach 0.69 % in the period 2045–2050.
2. Indicators of demographic transition
   (a) *Mortality transition in Egypt*
   - Life expectancy
   - Life expectancy at birth in Egypt gained 10 years from the period 1980–1985 to the period 2005–2010, increasing from 59.9 to 69.9 years. It is expected to reach 77.3 years in 2045–2050.

Table 9.1 The most frequent cancers in Egypt estimated using the results of the National Population-Based Registry Program of Egypt 2008–2011

Sex	The most frequent cancer site	%	Crude rate	ASR
Male	Liver	33.63	39.5	61.8
	Bladder	10.71	12.6	21.1
	Lung[a]	5.69	6.7	10.4
	Non-Hodgkin lymphoma	5.48	6.4	8.8
	Brain[b]	5.48	6.4	8.8
	Prostate	4.27	5.0	9.3
Female	Breast	32.04	35.8	48.8
	Liver	13.54	15.1	24.4
	Brain[b]	5.18	5.8	8.0
	Ovary	4.12	4.6	6.3
	Non-Hodgkin lymphoma	3.80	4.2	6.1
	Thyroid	3.28	3.7	4.3
Both sexes	Liver	23.81	27.5	43.6
	Breast	15.41	17.8	24.3
	Bladder	6.94	8.0	13.5
	Brain[b]	5.29	6.1	8.5
	Non-Hodgkin lymphoma	4.64	5.4	7.5
	Lung[a]	4.22	4.9	7.5

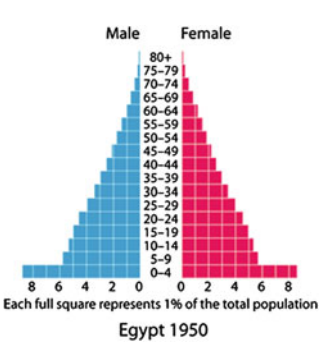
[a]Includes trachea, bronchus, and lung tumors
[b]Includes brain and nervous system tumors
Amal S. Ibrahim et al. [1]

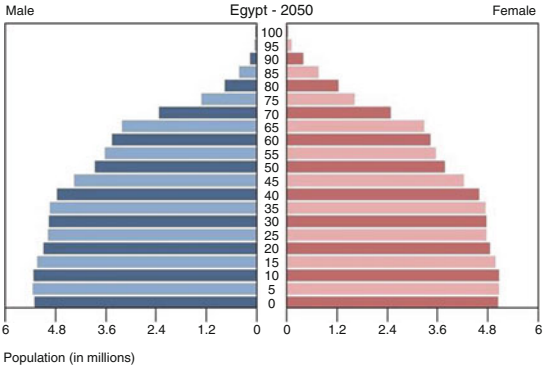
3. The population structure

(a) *Egypt's population age composition*
The proportion of the population under 15 years of age has been decreasing since 1980 and is estimated to continue declining to 2050. At the same time, the proportion of the working-age population (15–64) has been increasing since 1980. It is projected to reach 66.9 % in 2040 then it will decline to 65.9 % in 2050. The proportion of the elderly population (65+) has also been increasing and is expected to reach 12.3 % in 2050.

The age distributions in Egypt vary widely with major differences in the percentage of young and old as seen in Table 9.1. Hence, currently there is less cancer, but the expected change in demographics over the next 20–30 years is likely to result in an explosive increase in noncommunicable diseases such as cancer and heart disease [6].

(b) *Changing age structure*
In 1950, the pyramid had a wide base signaling the structure of a young population. In 2050, the pyramid is expected to narrow down [6].





(c) *Egypt's youth population*
In 1980, youth aged 15–24 years constituted 19.4 % of the total population and 35.16 % of the working-age population. In 2005, the percentage of youth increased to reach 21.1 % of the total population then started decreasing and is projected to reach 14.5 % in 2050 [6].

(d) *Egypt's elderly population*
The percentage of the elderly population (65+) in Egypt increased from 3.0 % in 1950 to 5.5 % in 2005 and remained as such in 2010. It is projected to continue increasing to reach 12.3 % in 2050 [6].

Current Status of Cancer Care in Egypt

An Overview and Profile of Frequent Cancers in Egypt

In men, liver and bladder cancers represented approximately 44 % of cancer in males.

In females, breast cancer occupied the top ranks accounting for 32.4 % of all cancers, followed by liver that accounting 13.54 %.

In both sexes, the proportions and rates of the most frequent cancer sites by gender, there was predominance of liver, breast, and bladder cancer that represented approximately 46 % of all cancers (Table 9.1).

During the period 2013–2050, population of Egypt is expected to increase to approximately 160 % the 2013 population size (Table 9.2). Applying the current age-specific incidence rates to successive populations would lead to a progressive increase in number of incident cases from 114,985 in 2013 to 331,169 in 2050, approximately 290 % of 2013 incidence (Table 9.3). This increase reflected both population growth and demographic change mainly due to aging of population. Population growth alone would increase the number of incident cases by 55.2 % in 2015. This fraction progressively decreased to become 32.8 % in 2050. The fraction due to aging gradually increased to reach 67.2 % in 2050 (Figs. 9.1, 9.2, 9.3, and 9.4).

Table 9.2 Incidence rates of cancer in Egypt (/100,000 populations) classified by region and sex for all cancer sites with and without nonmelanoma skin cancer (C44)

	Male		Female		All		Male:female ratio	
	Crude rate (95 % CI)	ASR (95 % CI)	Crude rate (95 % CI)	ASR (95 % CI)	Crude rate (95 % CI)	ASR (95 % CI)	Crude rate	ASR
All sites								
(i) Upper Egypt	97.1 (89.1–105.8)	142.8 (133.1–153.2)	116.9 (108.1–126.5)	167.1 (156.5–178.4)	107.0 (101.0–113.3)	155.0 (147.7–162.6)	0.8:1	0.9:1
(ii) Middle Egypt	109.7 (105.4–114.1)	170.0 (164.7–175.5)	95.9 (91.1–100.2)	132.1 (127.4–137.0)	102.9 (100.0–106.0)	151.1 (147.5–154.8)	11:1	13:1
(iii) Lower Egypt	138.5 (133.2–144.0)	191.8 (185.6–198.2)	131.7 (126.5–137.2)	173.3 (167.3–179.6)	135.2 (131.4–139.1)	182.6 (178.2–187.1)	11:1	11:1
(iv) Calculated rates of Egypt	117.3 (116.0–118.6)	178.5 (176.9–180.2)	111.7 (110.4–113.0)	159.1 (157.6–160.7)	114.5 (113.6–115.5)	169.0 (167.9–170.2)	11:1	11:1
All sites (excluding nonmelanoma skin cancer C44)								
(i) Upper Egypt	96.0 (88.1–1104.6)	141.0 (131.4–151.4)	115.1 (106.3–124.5)	163.9 (153.4–175.1)	105.5 (99.5–111.8)	152.5 (145.5–160.1)	0.8:1	0.9:1
(ii) Middle Egypt	108.0 (103.8–112.3)	167.2 (162.0–172.6)	94.9 (90.9–99.1)	130.7 (126.0–135.6)	101.6 98.7–104.6)	149.0 (145.5–152.6)	11:1	13:1
(iii) Lower Egypt	136.7 (131.5–142.2)	189.1 (182.9–195.5)	130.1 (124.8–135.5)	170.9 (164.9–177.1)	133.5 (129.7–137.3)	180.0 (175.7–184.4)	11:1	11:1
(iv) Calculated rates of Egypt	115.7 (114.4–117.0)	175.9 (174.3–177.5)	110.3 (109.0–111.6)	157.0 (155.4–158.5)	113.1 (112.2–114.0)	166.6 (165.5–167.8)	11:1	11:1

Cancer Care Facilities in Egypt

Egypt has more facilities for cancer treatment than any other country in Africa; however, many elements of cancer control strategy still need to be implemented or improved [7]. Cancer treatment facilities, in fact, include the biggest and more specialized center. In the Middle East is the National Cancer Institute (NCI) which is affiliated to Cairo University. NCI is carrying research, education, and clinical responsibilities and is considered the main reference in Egypt regarding cancer. Also, South Egypt Cancer Institute, Assiut University, Assiut, Egypt, 14 clinical

Table 9.3 Estimated cancer incidence in the period 2013–2050 and causes of increase

	2013	2015	2020	2025	2050
Estimated population	85,294,388 (100 %)	88,487,396 (103.7 %)	96,260,017 (112.9 %)	103,742,157 (121.6 %)	137,872,522 (161.6 %)
Number of cases[a]	114,985	122,783 (106.8 %)	144,255 (125.5 %)	168,723 (146.7 %)	331,169 (288.0 %)
Increased cases from 2013[b]		7798 (6.8 %)	29,270 (25.5 %)	53,738 (46.7 %)	216,184 (188.0 %)
Increased cases due to population growth[c]		4303	14,783	24,869	70,880
Increased cases due to population structure change[d]		3494	14,487	28,869	145,304
% increase due to population growth[e]		55.20 %	50.50 %	46.28 %	32.79 %

[a]Number of expected cases depending on 2013 rates of incidence
[b]Number of increased cases from 2013 number of cases
[c]Number of increased cases (from 2013) that is attributed to increase in population number (population growth)
[d]Number of increased cases (from 2013) that is attributed to change in population structure (aging of population) and not to population growth
[e]Percentage of increased number of cases (from 2013) that can be attributed to population growth only (not due to change in population structure)
Amal S. Ibrahim et al. [1]

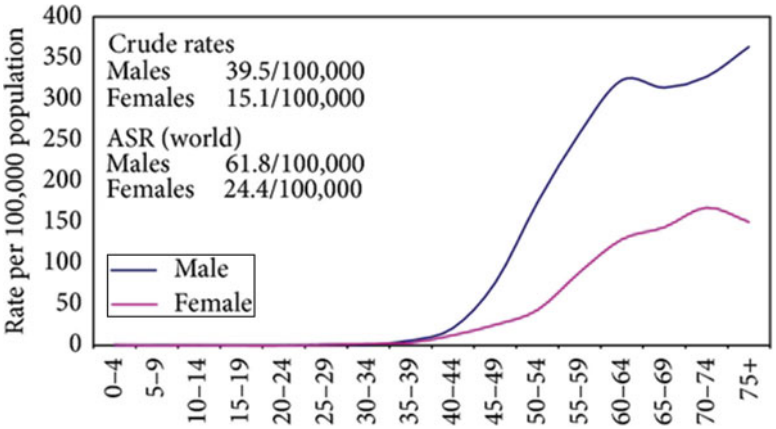


Fig. 9.1 Calculated age-specific incidence rates for liver cancer in Egypt 2008–2011

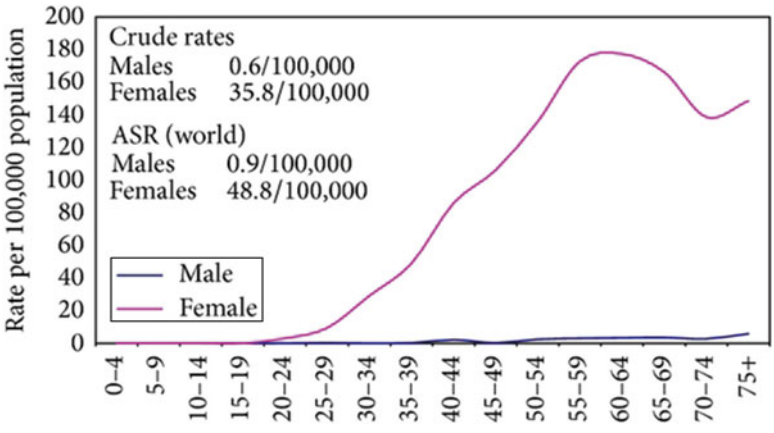


Fig. 9.2 Calculated age-specific incidence rates for breast cancer in Egypt 2008–2011

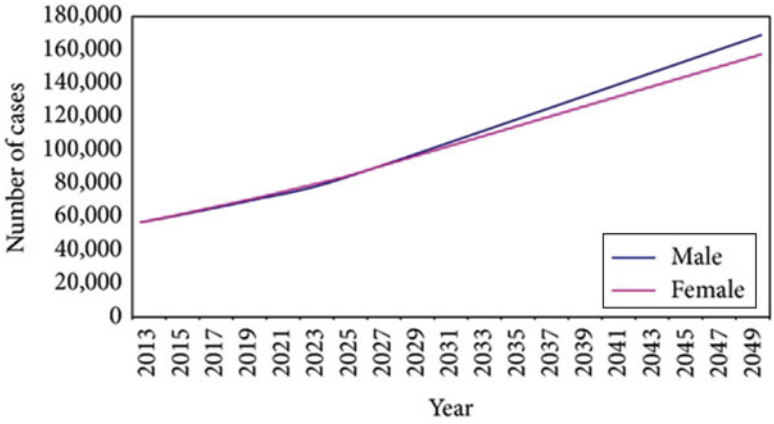


Fig. 9.3 Estimated number of cases in Egypt (2013–2050)

oncology departments in the other public universities; ten cancer centers affiliated to the Ministry of Health in 12 governorates; 11 military cancer units that treat both civilian and military patients; oncology clinics at the hospitals run by the Egyptian Health Insurance Organization in most major cities; semi-private, NGO-operated cancer facilities; a charity-run Centre of Excellence of Pediatric Oncology in Cairo; and private-sector clinics and centers. In addition to surgery, most of these facilities have chemotherapy and radiotherapy capabilities (either linear accelerators or cobalt-60 units). Most centers have CT scanners and MRI machines, and the country has five PET-CT scanners [8].

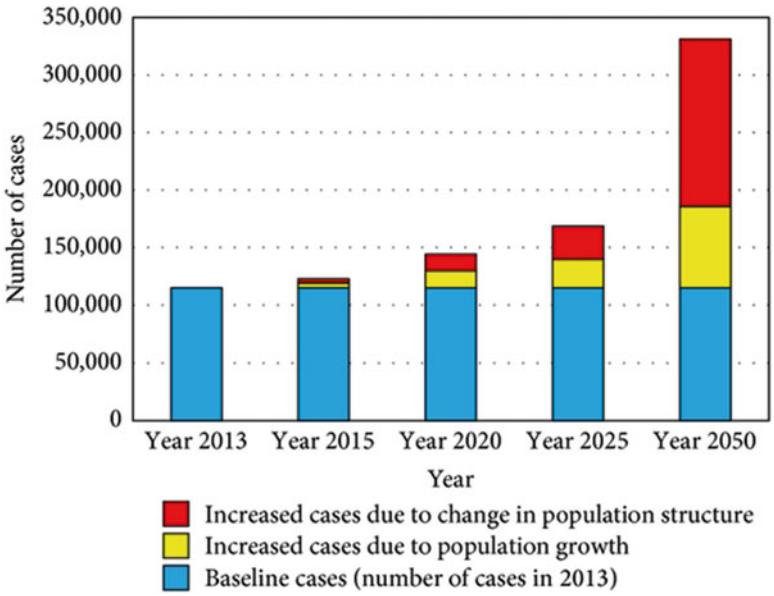


Fig. 9.4 Estimated number of cases in Egypt (2013–2050) and causes of the increase in cases

According to the WHO survey, Egypt had an operational policy, strategy, or action plan for cancer in 2010. However, no structured national cancer control program as recommended by WHO is in place. Practical measures are needed for the optimum allocation of available resources to reduce the numbers of cancer cases and deaths and to improve quality of life for patients with cancer, through adoption of WHO recommendations [9].

Approaches to Cancer Control

Prevention and Early Detection of Cancer

Although screening by mammography has been accepted as the gold-standard to ensure early detection of BC, its cost–benefit ratio is still debated in the scientific community. It is important to keep in mind that even in the best screening settings, most deaths from breast cancer are not currently prevented by mammography screening. The latest reviews indicate a reduction of no more than 15 % in BC mortality rate after introduction of mammography screening in western countries. Recent studies suggest that screening by CBE could achieve a reduction of 52–88 % of this magnitude with a better cost-effectiveness ratio.

Whatever screening tool is used, screening programs are resource-demanding and heavy-to-implement health interventions. Downstaging programs are an appealing alternative when resources are scarce, and should be considered as the first option in regions where a majority of BC is diagnosed at late stage.

In Egypt, most cancers present at an advanced stage when cure is improbable even with the best treatments. Where still a vast majority of tumors diagnosed are above 2 cm, there is room for improvement by a downstaging approach. Screening by CBE would be relevant to regions/groups where stage distribution is good enough that downstaging has no potential for major improvement. Early detection can result from both downstaging in some part of the country and screening in other parts. However, Egypt should follow the WHO and BHGI guidelines which call for countries to conduct research and pilot projects prior to establishment of national programs, as neither benefit of screening nor benefit of downstaging programs have been formally demonstrated to date in any developing country. A major element in improving survival rates in many cancers has to be the much earlier stage of disease at diagnosis and this could be brought about by public education and, in some cases, screening for premalignant lesions or early cancer [10].

In Egypt, primary health care workers are rarely provided with sufficient education about the early signs of cancer or where to refer suspected cases. This could be remedied by short training courses (ideally coupled to continuing education programs), brochures or posters, and by establishing links between those who deliver primary health care and referral centers. Population-based registries disease data are recorded. These data for breast cancers are 25.5 % of cases present at an early stage. It is clear that a high fraction of patients reaching these centers predominantly have advanced stage (stage III and IV) [11].

The Ministry of Health and Population Pilot Screening Program

The MOHP of Egypt has launched a pilot screening program in October 2007. This program is coordinated by Dr. Dorria Salem, Prof. of Radiology Cairo University and Head of Women's Imaging Unit. The purpose of this program is to screen women from 45 years old for:

1. Breast cancer (digital mammography exam)
2. Diabetes (blood sugar test)
3. Hypertension (blood pressure test)
4. Obesity (weight and height measurement)

The women recruitment process is based on the presence of mobile vans where all of the above exams take place. Few weeks before a van is moved to a district, the population is informed about the importance of screening, thanks to posters and pamphlets distributed in mosques, churches, and streets. Women eligible for screening (i.e., 45 years old or more) are contacted by phone or visited by heath

workers of the Red Crescent to encourage them to come to the vans. Only women without breast complains are admitted for breast cancer screening. The complaining patients can go to the women's imaging unit at Al-Kasr Al-Ainy teaching hospital.

The pilot phase of the project has begun in October 2007. By February 2009, 25 different locations in Cairo, Giza, and Alexandria governorates were visited; up to 22,000 women had been screened, 406 were referred for further diagnosis, 75 (18 %) turned out to be false positive. Out of the real positive, 59 (18 %) were operated, 73 (22 %) refused diagnosis or treatment, 35 (11 %) were not reachable, and the remaining were into the diagnosis or treatment process.

One of the main problems encountered is to convince women who have a suspicious mammogram, to go for diagnosis and treatment as some refuse or disappear. Health workers from the NGO "Hope" are dedicated to this task. This kind of problem is frequently observed in developing countries when screening for breast cancer.

A TV media campaign about screening has taken place during the autumn 2008 to raise awareness about breast cancer and facilitate acceptance of screening, as well as a campaign on the local radio station Nogoom FM; a new TV campaign should start soon [12].

The Breast Cancer Cairo Trial

The BC Cairo Trial is a research project designed to evaluate the efficiency of screening by clinical breast examination (CBE) in the context of primary health care (PHC). The project has been designed by Pr. Tony Miller, Epidemiologist at the Public Health Sciences Department of Toronto University (Canada), and is headed in Cairo by Dr. Salwa Boulos, radiologist in charge of the mammography unit at the Italian hospital until recently and now at El-Gallaa Hospital. The project has been financially supported by the Italian embassy in Cairo and the European School of Oncology (Milan).

The study has been launched in other countries of the region (Yemen, Iran, Sudan) but Cairo was the first and is thus the more advanced center of the study. The study was launched in May 2000 and has begun by a pilot phase (phase I) followed by a classical randomized trial (phase II and III).

Phase I (Pilot Study)

The initial target group was women 35–64 living in a geographically defined area (eight blocks) around the Italian Hospital (Abasseya district). In this pilot phase, 4116 women were contacted by social health worker (door to door visit) to attend designated PHC centers for Clinical Breast Exam at pre-determined date and time.

Table 9.4 Preliminary comparison of the stage distribution in the Cairo Trial

	Screened group (%)	Control groups (%)
Stage I	30	8
Stage II	43	18
Stage III	20	44
Stage IV	7	30

Of the women targeted, 60 % ($N=2481$) attended, of those who attended 12 % ($N=291$) were found to have abnormalities, of these 82 % ($N=236$) attended the Italian hospital for diagnosis, and of these 3.4 % (20 women) were diagnosed with BC. This latest number corresponds to a quite high prevalence of BC: 8/1000. Only one BC patient was less than 40.

Phases II and III

The target group was restricted to women 40–64 and divided in two groups based on residential blocks (four blocks each). The group A was offered active screening as in the pilot phase, the group B received only health education. Two additional areas were identified each with 5000 women aged 50–65 who were cluster randomized. The reputation of the trial preceded subject recruitment and there was higher acceptance than in the pilot phase, with 85–91 % of women accepting to go for screening.

Although follow-up of all groups is yet to be completed, preliminary results are encouraging. Stage distribution in both screened and control groups are given in Table 9.4.

This trial is testing an approach to early detection which is promising for Egypt; it would be beneficial to extend this trial to other centers/towns of Egypt. However this requires important resources, especially human resources, i.e., dynamic and dedicated local PIs, not mentioning international specialists.

It has to be mentioned that the idea of screening by clinical breast exam usually receives very little support from the medical community in low- and middle-income countries; CBE is erroneously perceived as inefficient because of its low-tech nature. This is a misconception that could be tackled in Egypt by an increased publicity about the Cairo Trial [13].

Remarks on the Two Screening Experiments Taking Place in Egypt

The populations at risk of BC in Egypt, i.e., the women above 45 years of age, are approximately 8.5 millions. The 22,000 women screened by the MOH mammography program in 1.3 years and the 15,000 women screened by the Cairo Trial

screened women in 8 years represent, respectively, 0.26 % and 0.17 % of this target population. Such percentages are a little demoralizing in view of the dedication, effort, and resources which were put in these two screening programs. However these programs are pilot studies and they are not aiming at a rapid national expansion, especially the Cairo Trial which should be viewed as a research project, but their results raise some concerns about the feasibility of a national screening program in a country like Egypt in a foreseeable future [13–15].

Fakkous and Port Said Program

A program in the rural region of Fakous and the urban region of Port Said used local resources to increase awareness of breast cancer and its treatment by organizing home visits from primary care workers and meetings with local women resulted in a substantial reduction in cases of advanced breast cancer. About 20 % of breast cancer cases in Port Said were amenable to conservative breast cancer surgery in 2008, and the number of stage III and IV cases had halved by 2004–2008 compared with 1992–2003 [16]. Conversely, early detection programs without access to treatments would be fruitless and frustrating for both patients and health professionals.

The Breast Cancer Foundation of Egypt

The Breast Cancer Foundation of Egypt (BCFE) was established in 2003 by a small group of health care professionals, survivors and public spirited citizens as a nongovernmental, nonprofit organization under the Ministry of Social Solidarity. At that time, there was no established BC awareness governmental program and no other NGO was working in this area. The public in general was not receptive to information about cancer. The topic was considered taboo in Egypt.

The BCFE philosophy is to advocate for BC awareness and services by serving the public in a manner that generates happy clients and positive recognition. BCFE partners with the National Cancer Institute (NCI) for teaching health care professionals. It is a mutually beneficial arrangement that does not involve the exchange of money.

In the past few years BCFE has done educational presentations and opportunistic screening programs wherever asked for, i.e., private companies and ministries. The BCFE staff designed the screening program, all the tools for implementing it, the training program for doctors and nurses to provide screening services. BCFE surveyed the facilities of hospitals that wanted to establish an early detection clinic and recommended changes to support a good patient flow, privacy, and efficiency. These services were provided free of charge to any facility requesting this assistance. The cost was supported by the sponsored screening program.

BCFE deals directly with many patients. Quick referral mechanisms and the link to treatment services are ensured. Poor patients are referred to free clinics of NCI. If they are covered by insurance they are advised WHERE and WHO to go to. If they do not want to go to NCI and are not covered by insurance, BCFE arranges for treatment for them at a low cost facility, or through a doctor that will charge reasonably [17].

Egyptian Society for Promotion of Women's Health

Egyptian Society for Promotion of Women's Health (ESPWH) is a nonprofit organization, nongovernmental organization under the Ministry of Social Solidarity, established in June 2009; Dr. Karima Elshamy is the founder and executive director. The aim of establishing ESPWH was to improve and promote the health of women, increase women's awareness regarding many diseases, especially cancer awareness, control and prevention, reducing cultural barriers and detecting cancer as early as possible, also for education of people, health care personnel, and research. ESPWH is a member of Alliance of African & Mediterranean French Speaking Leagues Against Cancer.

Liver Cancer Prevention

Many countries, including the USA, are experiencing a decades-long trend of increasing rates of liver cancer. The most common type of liver cancer, hepatocellular carcinoma (HCC), has a high mortality rate and limited therapeutic options, to which most populations have limited access.

The prevention of this type of cancer is especially urgent in developing countries. Among the major contributing factors to the development of HCC are chronic infections with hepatitis B (HBV) or hepatitis C (HCV) virus, and food contaminated with aflatoxins (toxins secreted by molds that infect improperly stored grains and nuts).

Fortunately, these factors are amenable to prevention, including protections against blood-borne viral infections, vaccination against HBV, and improved food safety.

But would such strategies work in a developing country, such as Egypt, and why would Egypt be an appropriate place to test the effectiveness of liver cancer prevention programs?

The research group began studying HCC in Egypt more than 10 years ago, following ground-breaking work on HCV led by Dr. G.T. Strickland of the University of Maryland, Baltimore. Dr. Strickland's studies of HCV in communities in Egypt revealed that the country has the highest rates of HCV in the world, the unintended

consequence of a massive public health campaign that used injected drugs to halt the suffering from a type of parasitic infection (Schistosoma species) native to the Nile River valley.

The evidence suggests that improper sterilization techniques applied to the needles in that campaign resulted—over a span of 50 years—in the spread of HCV and other viruses to a large segment of the population. The situation resulted in massive epidemics of chronic liver disease, cirrhosis, and HCC that have not yet reached their peak. The rate of HCC is about four times higher in Egypt than in the USA, and rising at a faster rate. Each year, over 15,000 Egyptians die from liver cancer.

Dr. Karima Elshamy mentioned that the major risk factors for HCC in Egypt, in addition to chronic infections with HCV and HBV, are occupational exposures to chemicals, pesticides, and contamination of the diet with aflatoxins (alcohol abuse is uncommon due to religious customs that forbid drinking).

Each of these factors is preventable; yet beyond HBV vaccination, scant attention is being paid to preventive research or effective interventions, even in the more developed countries. In fact, a recent report by the U.S. Institute of Medicine concluded that the lack of knowledge and awareness of viral hepatitis among members of the public and policy-makers were major barriers to prevention.

Added to the burden of viral hepatitis in Egypt is the unsafe handling of pesticides in agriculture—its predominant industry—and the lack of awareness of safe food handling practices regarding aflatoxins. A program of health education focused on these and other risk factors for HCC could deliver appropriate information at low cost, aimed at empowering households to interrupt the current cycle of viral hepatitis transmission and carcinogenic exposures.

Over the long term, this approach could be used by many countries to reduce the human, economic, and societal costs of this fatal and rising type of cancer.

To fit the specific needs of Egyptians in the context of their society and culture, a community-based health education approach tailored to the population at risk for cancer would offer many advantages. Community-based participatory research involves members of local communities in all aspects of a study-from design to dissemination-to ensure that the proposed intervention reflects the specific needs of the communities, and to strengthen the capacity of the community to implement public health activities.

Moreover, the engagement of peer educators to deliver the health education program, which has been shown by Sarah Dalglish and others to be highly effective in such issues as tobacco prevention and reproductive health interventions, would be highly innovative in the context of HCC, where little or no such work has been previously reported [18].

Egypt's Infection Control Program (ICP) was designed in collaboration with the WHO and is considered the reference for the Eastern Mediterranean region. In 2001, MOHP began by assessing infection control policies, indicating a need for action. For example, only 16 % of HCW were vaccinated against HBV, hand washing rates were extremely low, and needle stick injuries occurred at a rate of 4.9 % per worker per year.

The resulting program includes training of HCW; the establishment of infection control committees at the levels of the governorate, the directorate, and the hospital; and regular monitoring by local and national teams. As of January 2008, the plan has been implemented in 283 hospitals, representing all MOHP hospitals with more than 50 beds in 21 governorates. Further, all HCW in all MOHP facilities, including primary health care units, have been vaccinated against HBV in six governorates (Cairo, Alexandria, Sharkia, Monofiya, Menia, and Qena). In 2009, MOHP will add the remaining 70 hospitals with more than 50 beds, to cover all 27 governorates, and vaccinate all health care workers in these facilities nationwide.

The National Committee on Viral Hepatitis, under MOHP, mandated the development of the Control Strategy 2008–2012 to ensure the strengthening and expansion of the national, multicultural response to viral hepatitis. This plan builds on what has already been achieved and is based on the best epidemiological estimations of viral hepatitis in Egypt and the latest scientific knowledge [18].

Egyptian National Control Strategy for Viral Hepatitis 2008–2012

The National Control Strategy for Viral Hepatitis is the first comprehensive approach to reducing the prevalence, incidence, and burden of disease associated with hepatitis B and C in Egypt. It represents a comprehensive, multisectoral response to the challenge of this major public health issue and is informed by the latest medical and scientific research on viral hepatitis in Egypt. The Strategy seeks to provide guidance to various government ministries and agencies, as well as to nongovernmental partners, in order to ensure coordination and cooperation among them. The plan has been elaborated in concert with the Egyptian National Committee on Viral Hepatitis and in consultation with officials from the Ministry of Health and Population, the Ministry of Higher Education, various UN agencies and the WHO (Geneva and Cairo), as well as researchers at Egyptian universities and other local and international stakeholders involved in the fight against viral hepatitis [5].

Research

One of the most successful elements of the fight against viral hepatitis in Egypt has been the creation of an international research network called the Liver Disease Research Unit. The network brings together Egyptian, French, American, Swedish, and Finnish universities and research institutes. External funding has been provided by USAID, the National Institutes of Health (USA), the European Commission, the French ANRS and Ministry of Foreign Affairs, and the Welcome Trust, among others.

Diagnosis and Treatment of Cancer

Viral hepatitis cannot be treated at the periphery of the health care system (e.g., in primary health care units), since its management requires special training for physicians and special equipment for diagnosis, follow-up, and drug storage. Some 100 hospitals in Egypt are currently equipped to treat patients with advanced liver disease, and there are approximately 400 specialists in advanced liver disease working mostly out of major cities. However, the quality of care and degree of access to drugs may be heterogeneous throughout these facilities.

Recently, ten National Treatment Reference Centers were opened under the supervision of the National Committee on Viral Hepatitis, providing care for patients with HBV and HCV according to standardized guidelines and at subsidized costs. The Egyptian government provides 20,000 LE for the treatment of each HCV patient treated under HIO and or at government expense, categories which include 94.1 % of the 12,089 patients having started treatment as of February 2008. These outlays do not include financial expenditures required for monitoring, testing, facilities, and related costs. The total cost to the government is thus a not insignificant percentage of the annual MOHP budget.

Transplants are currently available at approximately 10 public and private facilities, though donors can be difficult to come by and cadaveric livers are not yet available in Egypt. As of 2008, the cost is high (220,000–400,000 LE), though some government assistance is available [19].

Surveillance and Monitoring

The most recent population-level surveillance study is the 1996/7 Egyptian household and workers national survey. It is impossible to say with any confidence how prevalence rates have changed in the 10 years since the completion of this study; however, an upcoming (2008) DHS survey will provide new figures on the prevalence of HBV and HCV infection.

There is currently no ongoing sentinel surveillance of chronic HBV and HCV, with the exception of monitoring of infection rates in Hemodialysis units as part of the national Infection Control Program. Additionally, the MOHP's Epidemiological Surveillance Unit, established in 1999 with the cooperation of WHO, EMRO, and the CDC, coordinates surveillance of 26 communicable and noncommunicable diseases. Forty-two cases of acute hepatitis A, B, and C are reported monthly from the network of 256 district surveillance units.

However, surveillance figures do not accurately reflect the number of cases for several reasons: underreporting due to time constraints on health care workers (HCW); the lack of a reliable IgM assay for acute HCV, making it more difficult to diagnose than HAV or HBV; and the fact that surveillance only covers MOHP facilities. Participation by private facilities is voluntary, and thus difficult to enforce. The laboratory support for surveillance also needs strengthening, as labs are not always fully equipped [19].

Pain Relief and Palliative Care in Egypt

In most of the world, the majority of the cancer patients present with advanced disease. For them, the only realistic treatment option is pain relief and palliative care. Effective approaches to palliative care are available to improve the quality of life for cancer patients. Lack of access to basic pain relief continues to make living and dying with cancer in Egypt a very different experience from that in developed countries.

The National Cancer Institute (NCI) in Cairo was established in 1969 as a specialized institute, affiliated with Cairo University. In 2004, palliative care was included in the oncology medical training program at the National Cancer Institute at the University of Cairo. In 2006, there were two organizations providing hospice palliative care in Egypt: the Cairo Evangelical Medical Society (which has hospice facilities in Cairo and Alexandria) and the National Cancer Institute (which puts an emphasis on cancer pain relief). In 2010, the NCI, Cairo, has cared for 18 156 new patients which comprised 70–80 % of all cancer patients in Egypt. A total of 70 % of all new cancer patients were diagnosed with an advanced stage of the disease. NCI's first initiative towards the development of palliative care services was in 1981 when the first pain clinic was established as part of the Department of Anesthesiology. This clinic handles 120–150 patients daily, while slow release morphine tablets are the only available pain medicine [20].

At the present, NCI is running a pain care clinic at its outpatient pain department. This clinic operates on a the capacity of a 24 h/7 days basis, and its staff comprises pain management physicians, specialized nurses, clinical social workers, pharmacists, psychiatrists, dietitians and administrative manpower. In addition, a hotline service was established, thus enabling easier access to the experts on the team. In addition to the NCI, Cairo, the El-Kasr El-Aini Cancer Center in Cairo also runs a pain clinic and a palliative care service (started in 2007). The new Children's Cancer Hospital 57357 in Cairo runs pediatric palliative care services including psychological support. The Cairo Evangelical Medical Society provides inpatient and day care hospice services (opened in 2001), while similar services are provided by the Elhadra Elromany hospice in Alexandria [20].

Palliative care in Egypt is in an early stage of development with very few palliative care activities available even in all of the above specialized centers. At this stage, research is crucial to develop suitable palliative care models with respect to the needs, culture, and resources in Egypt.

Opioid consumption figures in Egypt are among the lowest worldwide indicating largely inadequate cancer pain control. Based on the data published in the most recent annual report of the International Narcotics Control Board, the average opioid consumption in Egypt during 2008–2010 was 62 defined daily dosed for statistical purposes (S-DDD) per million inhabitants per day. With this figure Egypt was ranked 115th among 184 countries [21].

Ethical, Religious, and Cultural Issues

All patients probably undergo the stages of acceptance of terminal cancer in the same fashion. The difference between Egyptian and Western cultural practices would likely be in the culturally specific coping strategies. Ultimately, the physician and other health care providers have to assess the patient in his cultural context and find out what would help the patient the most to go through the terminal phase of the disease. The community bond amongst Muslims is very strong, most end-of-life issues are preferably taken care at home amongst family members rather than in hospice facilities.

In dealing with a patient, a physician must take into account the degree of his cultural inclinations as well as that of his family in order to communicate and provide best medical treatment effectively. Invariably, communication and empathy are indispensable in achieving this. In an increasingly westernizing society, a physician should be wary of imposing generalized belief models on patients without first understanding their background and preferences.

Islam is the dominant religion in Egypt, and observant Muslims believe that having an illness represents an opportunity to enhance the Muslim's degree or expiating personal sins. Yet, Islamic teaching encourages Muslims to seek treatment when they fall sick, as it is believed that Allah did not send down a sickness but rather a medication for it [22]. Muslim's beliefs attribute to occurrence of pleasure and suffering to the will of Allah, and that every effort should be made to relieve suffering. Moreover, Islamic teaching considers the relief of suffering to be highly virtuous [23]. According to Islam, adults of both genders are granted the full right to accept or decline medical intervention. In reality, close family members are more often directly involved with the decision-making process. Generally, parents, spouses, and older children, in descending order, have greater decision-making power than the other members of the family [24].

Islamic teaching encourages the community members to visit the sick and the sick to welcome their guests. Patients, therefore, may entertain a larger number of visitors during their hospitalization [22]. The use of drugs that might affect consciousness is strictly prohibited in Islam. However, medically prescribed opioids are generally permissible because of their necessity. Usually, patients and families accept the use of opioids for symptom management, provided the rationale for their use is clearly explained to them. Of great importance is to explain patients and their relatives the possible side effects, as there are great concerns about an imposed drowsiness [25].

Issues that relate to end of life are compounded spiritually and ethically, and are open for interpretations. While discussing the prognosis of the loved one, Muslim families are often skeptical about receiving clear cut massages from the treating physician. The former are for the most part more comfortable receiving less concrete information and quite often would respond with: "This is in Allah's (God's) hands, and we are not to predict the fate of the patient." Such a response is largely due to the Islamic belief that the life expectancy of every person is only

up to Allah, who is the one to determine the timing of death. Families, however, are very appreciative being updated as to the patient's condition, in order to enable them to carry out the traditional funeral rites. Taking all of the above into consideration, caregivers in Egypt exercise all the precautions and sensitivity while talking to terminally ill patients and their families [20].

Barriers for implementing Egyptian palliative care include the following:

Health Care Systems and Policies

- The big challenge to Egyptian palliative care professionals is the development of hospice systems along with well-organized home-based services.
- Lack of national health policies in support of palliative care development
- Focus on acute care
- Poor understanding and awareness of the role of palliative care in community
- Lack of legislation and accreditation of this new specialty discipline
- Lack of facilities and resources for palliative care
- Palliative and end-of-life care not prioritized in health care strategies
- Lack of long-term care and community services
- No statistical data about how and where patients die, how many receive PC, and the characteristics of the caring process
- Insufficient supplies and equipment

Health Care Professionals

- Inadequate training for both health care professionals and general public about the necessity and importance of palliative care as integral part of cancer care
- Palliative care as a discipline is being seen as less prestigious
- Lack of interdisciplinary concepts and teams
- Negative attitude towards caring for dying patients
- Fear of opioid use (fear of side effects and/or fear of prosecution)
- Resources focused on curative treatments and acute care
- Perceived sense of failure

Patients and Families

- Fear of addiction to opioids
- Fear of abandoning family members
- Unrealistic hopes of cure
- Families also refuse admission to hospice which is considered as a place of death, isolated and unfriendly
- Diversity in religious interpretation of death and dying

Drugs

- General lack of opioids and unavailability of opioids in remote areas
- Very strict opioid prescription and dispensing policies
- Lack of other essential medications lists
- Poor accessibility of essential palliative care drugs

Education and Training

- Lack of palliative care education programs at all levels
- Lack of funds for setting up education programs or hiring experts

The National Cancer Registry Program of Egypt

The National Cancer Registry Program of Egypt (NCRPE): Population-based cancer registry, it was initiated through a protocol of cooperation between the ministries of Communication and Information Technology, Health, and Higher Education. The Supreme Committee of the Program decided to start by population-based registration of incident cancer cases and to explore the possibility of establishing a national cancer database through eventual inclusion of hospital-based cancer registries in due time. The registry program started in 2008 and covered Aswan Governorate followed by ElMinia, Beheira, and Damietta. Governorate of Gharbiah already has a registry that was established 10 years ago and will be included in the national registry program in a subsequent phase. Egypt will thus be covered by a network of population-based registries geographically spread all over the country. The Metropolitan Cairo is not covered by population-based registration due to logistic difficulties. Nonetheless, comparison of program results with those of the National Cancer Institute in Cairo would give a clue to the profile of cancer in the Metropolitan Cairo Area and complete the picture for Egypt [26].

Government Involvement in the Care for Cancer Patients

The ministry of health and population is responsible for overall health and population policy as well as the provision of public health services, and is responsible for health insurance organization that provides services too, cancer registration, access to public health awareness through working as change agents, increase health awareness and literacy, educating patients on patients' rights, encouraging volunteerism, and public campaigns and community outreach, access to early detection through: leading the Egyptian breast cancer program, increasing accessibility of early detection services, and improving the quality of services across the country. Also, accreditation program through capacity building of health care providers from all sectors, access to quality cancer treatment, and prioritizing quality cancer care.

The Ministry of Higher Education

The ministry of higher education is however responsible for health profession education (medical, nursing, dentistry, and pharmacy) and also runs university teaching hospital, access to research through creating an enabling environment

for research and academics, moving toward evidence-based decisions at the national level and pushing boundaries of clinical research, in addition to community services.

Nongovernmental Organization Responsibilities

Nongovernmental organizations focus on the prevention and early detection of cancer. The nongovernmental sector is an important source of technical knowledge, skills, and resources relevant for cancer care and research, this involvement implies either direct provision of the services or acting as funding institutions. Furthermore, nongovernmental organizations provide an important ability to reach out to the professional and public communities, advocate for cancer prevention and control, offer cancer education and screening services in our community, support cancer patients and survivors. They have access to patient support, patients support groups, financial support, transportation, accommodation, food coupons, and the sharing of survivors' stories. Nongovernmental and voluntary organizations can, therefore, play a significant role in assisting the efforts of the government health system in reducing disparities in coverage regarding cancer care services.

Prof. Dr. Karima Elshamy (Head of Gerontological Nursing Department, Faculty of Nursing, Mansoura University, Egypt and AORTIC Vice President of North Africa) reported that it is very important for all organizations to be aware of the complexity of cancer control, and of the role they should play in achieving the goals of the cancer control program or strategy, through a unified effort with other sectors. Improved cancer control will, to a substantial degree, relate to prevention strategies and early detection programs, including information campaigns and population-based screening programs. Success of the early detection programs will rely on effective and optimal use of treatment possibilities.

Cancer Education in Medical, Nursing, and Pharmacy Schools in Egypt

More than 1500 Egyptians have postgraduate qualifications in clinical and medical oncology. The medical and health-related educational system in Egypt has advantages and limitations. Medical education includes a unique system of 3-year community-based public health training, but better planning and collaboration among schools could notably increase new physicians' knowledge of cancer detection and prevention. Nurses and pharmacists exert great influence in the provision of health care. Yet, their training includes neither cancer education nor information about prevention. The medical and health-related educational system in Egypt has many limitations, but it has the structure and inherent ability to achieve cancer

education goals [27]. Prof. Dr. Karima Elshamy added that many nursing researches, master and doctoral thesis in faculty of nursing, Mansoura University focus on cancer and palliative care.

Interrelationship Between Cancer Care and Local Culture

Culture refers to a set of shared attitudes, values, goals, and practices that characterize a group. Cancers are known to be a result of both genetics and lifestyle factors. Lifestyles emanate from cultural beliefs, values, and practices. Thus culture affects both the risk factors for cancers and the meaning of the disease by influencing the behavior responding emotionally, cognitively, and socially to this disease. Culture will determine approaches to prevention, early detection, treatment choices, and management of side effects such as pain, appropriate psychosocial support, rehabilitation efforts, survivorship issues, hospice use, and effective end-of-life care.

Cultural values, beliefs, and assumptions influence health care. In every clinical encounter, providers decide what to say and what not to say, who to include in important discussions, how to provide patient teaching, and when to schedule follow-up care. When providers are working with someone from another culture, these decisions may be influenced by assumptions and stereotypes about what people from that culture are like. If the assumptions are wrong, a person's health can be seriously jeopardized.

Cultural Influence in Cancer Screening

There has been much debate regarding cultural influence on cancer screening, especially that regarding culturally sensitive regions of the body such as the breasts, cervix, and colon. Cultural factors have been shown to play a vital role in women's attitudes to breast cancer screening. Cervical cancer screening has been widely implemented and has been subject to much study [28].

Cultural Influence in Cancer Diagnosis and Disclosure

Confucius teaches that in a society, every person has a role and obligations to fulfill. In the context of cancer diagnosis, this phenomenon is particularly acute. To a parent of a young family, a diagnosis of cancer immediately brings the burden of the possibility of being unable to fulfill his or her duties to raise the young and provide for the family. This may produce intense feelings of guilt, shame, and anger. These reactions must be taken into consideration by the health care provider in relating to the patient.

Another factor relates to the phenomenon of reciprocity and filial piety (righteousness). As the parents grow old and the children come to maturity, the role of the provider is gradually passed to the children and in the twilight years, it often comes to pass that the family will make most of the decisions for the elderly ones. It is widely observed in local medical practice that in Egyptian families, the children often wish to conceal the diagnosis of cancer from the patient. At times, the diagnosis is explained to the children who stay behind in the consultation room after the patient leaves. This is entirely opposite to the grain of Western bioethics of medical confidentiality and patient disclosure. Indeed, this practice is not usually seen in clinics in the West where the very opposite occurs: the patient attends the consultation alone and certainly would hold the confidentiality of his medical information dear.

Amongst the Muslims, again the concept of God's will influence the willingness to accept bad news and even mishaps and regard it as fate and thus may be more forgiving to the carers. Research has shown that distribution of BC is within the younger age group of Egyptian patients, the majority of cases occurring between 30 and 60 years of age. The median age at diagnosis is 49 years, one decade younger than the corresponding age in Europe and North America [29].

Reduction in mortality from BC depends to a large extent on interventions aimed at early detection and treatment; including breast self examination, clinical breast examination, and mammography [30]. Lack of early detection programs is the primary reason for the escalation of the mortality rate from BC in developing countries [31].

Not seeking medical advice unless one is ill, followed by the women's beliefs that physical checkups were not worthwhile were the most common personal barriers revealed by the present participants. In their study among women from rural Egypt, Younes et al. stated that many Egyptian women suffered in silence, endured much pain and discomfort before they would admit to being ill, and would mostly only seek treatment when their symptoms became severe [32].

Unsurprisingly, a significant proportion of the women in the present study reported they were afraid of discovering that they had cancer, and embarrassment by the screening was a personal barrier. Generally, there are many personal obstacles for women to access prevention services. The fear of discovering cancer, embarrassment, and fear of the screening procedure were among the most commonly reported personal/cultural barriers to using the screening services [7, 33]. Spirituality and religion have been identified as major determinants of fear and fatalism with regard to BC in previous research [33]. Personal barriers can be overcome by promoting health seeking behavior and educating the public on the importance of early detection of cancer with a message that empowers women to take charge of their own health.

The Impact of Culture and Religion on Truth Telling at the End of Life

In Islamic ethics, family and community are intrinsically linked with each individual's well-being [34]. Similarly, in many Asian cultures, illness is a shared family event rather than an individual occurrence [35]. The family provides a source of

strength, hope, and connectedness to others. Accordingly, the principle of autonomy does not bear the same weight as it does in many Western cultures and thus the family is the locus of the decision-making process [36]. A Japanese study [37] found that 46 % of the population felt it was the family's duty to provide "a protective role in shielding the patient from a painful diagnosis" [38]. Equally, in Ethiopia and Saudi Arabia, information regarding a patient's illness belongs to the family, who then use the information in the best interests of the patient [39, 40]. Physicians, consequently, respect the "autonomy of the family as a unit" [36].

Society Reaction Towards Cancer Patients

Cancer is one of the oldest diseases of human beings. Diagnostic and therapeutic aspects have advanced significantly. The life span of a cancer patient of today is increased considerably because of multifarious approach by scientists and medical personnel. However nothing much is done regarding the status of the patient in relation to the society and the mental, behavioral, and physical aspects.

Social reaction towards the cancer patient ranges from total nonnormalcy to almost normalcy. Most of the families believed in "God's Way," the others were showed no significant reaction. Children of the patient were more concerned, affectionate, and sympathetic to their mother than the others. The husbands were either badly affected psychologically or kept up calm to face the situation. This was more so in educated ones. Some families encouraged the patients to gain strength and to face the disease which in turn has helped the patient to lead an almost normal life. The non-acceptance in the society, based on no firm grounds, is leading the patient to despair. However, avoidance of the patient in one pretext or the other is prevailing in significant number of cases.

Anger, irritation, sense of inferiority, insecure feeling, emotional stress, and total lack of hope of survival were the main feelings. Given a proper atmosphere of normalcy and affection, the quality of the life and survival time would be enhanced significantly. Philosophy has come as important source of solace to many affected families [41].

Summary and Recommendations

In Egypt, cancer is already an important health problem and will become increasingly important not only in terms of rank order, as infections are better controlled, but also in terms of incidence and mortality. The commonest sites were liver and breast among men and women, respectively. Based upon the results of National Cancer Registry Program, Egypt is expected to experience the highest increase by 2050; the following recommendations could enhance the effectiveness of cancer care in Egypt.

1. The ministry of health and population should recognize palliative care as a new subspecialty for nurses, and expansion of palliative care services to a larger number of patients and illnesses throughout the country, considering home-based palliative care service is urgently and badly needed.
2. National Committee for Pain Relief and Palliative Care should be developed, and the latter committee should develop a national plan that involves: education, clinical practice including opioids availability, accessibility and disposal, research, public policy, and evaluating and monitoring care plans and activities.
3. Strengthening health care systems; focusing on patient centered care that optimizes outcomes for patients that are patient focused and are based on the patients need as opposed to prognosis, optimal care to optimizes systems and access to services within available resources to provide the best care for the patient that is high quality and safe, also, management, monitoring and evaluation of interventions to ensure they are effective and remain effective. Making real improvements in management will require the proactive efforts of many organizations, and we believe that education as well as discipline should be the cornerstone of efforts to improve cancer care in general and pain relief and palliative care specifically.
4. Education at all levels to be undertaken to all staff members in the oncology units throughout Egypt would gain basic practical training in dealing with cancer patients suffering from pain and other physical, psychological, and spiritual symptoms. In order for such a plan to come about a ministerial-driven program is needed, whereby trained oncologists and oncology specialized clinical nurses be educated and trained in the following topics: communication skills between the clinical caregivers, the patients and their families, basic concepts of pain pathophysiology, pain assessment, choosing of analgesics and their dosing, management of visceral, somatic and neuropathic pain, management of other symptoms such as nausea, vomiting, constipation, and delirium, wound care, management of last hours of life including dyspnea, and how to overcoming cultural barriers. Also, to focus on subspecialties on the psychological, behavioral, physical, and spiritual.
5. Effective cancer prevention programs customized to the community should be fostered, particularly for prevention of hepatitis B and C infection, and breast cancer awareness and early detection, and encourage community share in the program by money donations, hospice places, volunteers, and training.
6. Pain and palliative care education and training should be incorporated in the training curricula of all medical schools, family residents training program and all postgraduate oncology and other chronic disease nursing training program, also palliative-care certified physicians are going to be central in coordinating this kind of care, clinical nurse specialists in palliative care, who provide palliative care at both institutional and community settings throughout the country are also needed.
7. Setting up hospital-based palliative care support teams would be the biggest foreseeable challenge; as currently there are neither nurses nor physicians

trained in palliative care within the public hospitals. These teams working within hospitals will offer an in-house consultant service, and facilitate their transfer to the community. The hospital-based teams will continually liaise with other services within the hospital as well as the home care teams to improve continuity of care, as well as provide education for both hospital and community health care professionals.

8. Many important BC screening barriers have been identified among this group of Egyptian women. Women's perception of these barriers was associated with some sociodemographic characteristics. Identifying barriers to breast screening in the local community will help to remove those obstacles and design more culturally relevant strategies to increase the utilization of breast screening service and to ensure adequate breast care of these women.
9. Changing the current opioid dispensing regulation and ensuring the availability of essential drugs.
10. Training and workforce capacity building are needed to improve research into cost-effective cancer-control interventions and clinical trials.

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