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**Dr Abdulrazak Abyad**

**MD, MPH, MBA, AGSF, AFCHSE**

*Chief Editor*

This is the fifth issue of the journal this year and we as of next issue, the MEJFM will provide a series of articles on the theme Focus on Quality Care. Each Focus will be written by experts in the field and will be published in one volume at the end of the series.

This issue is rich with a good number of research papers from the region. A study from Saudi Arabia investigate the use of antihypertensive medications in primary health Care. The aim of the authors were to find out the pattern of prescription of antihypertensive medications in Saudi primary health care, that will help in the identification of educational needs of practicing physicians. The study was a cross sectional study that included 13 primary health care centers. This study reveals evidence suggesting inadequate use of antihypertensive medications in PHC.

A study from King Hussein medical center looked at the lipid profile in diabetic patients. The aim of the study is to look at hypertriglyceridaemia, its age and sex distribution and prevalence in NIDDM and IDDM. One hundred and twenty patients of well established diabetes mellitus were included in the study. The authors concluded that Hypertiglyceridaemia is the most common lipid abnormality in diabetes mellitus, which is more common in NIDDM than IDDM.

In their first paper the Bangladesh Primary Care Research Network (BPCRN), reviewed the Past, Present and Future of Family Medicine in Bangladesh. The authors stressed that the aim of establishing a structures primary health care in Bangladesh with Family Medicine as an independent specialty can be achieved with priority government support and sincere cooperation from the medical fraternity. One of the aim of BPCRN is to contribute in achieving this goal.

Breast cancer detection and barrier to screening is discussed in two papers by Dr Al-Alaboud L & Kurashi NY. In the first study the authors studied The Barriers of Breast Cancer Screening Programs Among PHHC Female Physicians. This was achieved with a survey of 75 female PHC physicians in 43 Primary Health Centers regarding the barriers in implementing of breast cancer screening.

The main barrier of the BC screening program which may be instituted by PHCs female physicians was unavailability of a national screening program. Other barriers include time pressure, lack of training on the part of the physician, lack of good communication, there were not enough facilities in the PHHCs, lack of women

cooperation and trust, walk-in clinic, and social and cultural reasons.

The authors recommended the development and institutionalization of breast cancer screening program, massive educational program on breast cancer. In the second paper the authors studied the effects of The Effects of Breast Cancer Early Detection Training Program on the Knowledge, Attitudes, and Practice of Female PHHC Physicians. A total of 45 PHCCs' female physicians participated in a workshop on knowledge of BC concepts and skills was developed and implemented on the participants. In this study before intervention was given, the physicians had good knowledge about breast cancer and early detection but scored low regarding practice of BC early detection and had negative attitude of it too, and after the educational program, there were significant positive changes in physicians KAP.

A paper from Iran discussed the development of a Community-based Care System Model for Senior Citizens in Tehran. In Iran a considerable percentage of old people "live" in the society who need to receive specialized health services. In order to respond to these care needs, developing and implementing health and social care systems with consideration of relevant factors such as : existing resources and facilities; social and cultural issues and characteristics of each groups of elders seems to be necessary.

A study from Dubai reviewed the topic of Informatics in Clinical Practice The author stressed that though the implementation of a proper Electronic Medical Records system may be unaffordable for a small clinic most of the clinics use some form of computerized patient records. Detailed analysis of the data from these systems can provide information on key performance indices invaluable for strategic planning.

Dr Mutair et al, studied marine animal injuries to children in the South of Jordan. A total of 152 patients, who sustained different marine animal injuries in the Gulf of Aqaba were included in the study. SeaUrchin was the commonest cause of injuries while Stonefish was the cause of most serious injuries. A case report on the effect of vitamin B12 deficiency on infantile dyskinesia in an 11-months old female infant is presented.

At the end I would like to thanks all the contributors and looking forward for next issue in Nov.

# Use of anti-hypertensive medications: an Educational need in Saudi Primary Health Care

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**Key words:** Primary care, educational need, hypertension, Saudi Arabia, antihypertensive medications, audit

## ABSTRACT

**Objective:** To describe the pattern of prescription of antihypertensive medications in Saudi primary health care, which might help in the identification of educational needs of practicing physicians.

**Methods:** Cross-sectional study in PHC centers in Qatif, Saudi Arabia. Half of the adult hypertensives who were followed up (F/U) in 13 out of 26 PHC centers were selected, randomly. Doctors from participating centers collected data from charts of 320 patients in regard to the use of antihypertensive medications.

**Results:** Patients on no medication, monotherapy and combination therapy were 6.6%, 65.4%, and 28%, respectively. Beta-blockers (BB), diuretics, angiotensin converting enzyme inhibitors (ACEI), calcium channel blockers (CCB) and methyldopa were used by 62.2%, 36.3%, 22.8%, 4.4% and 1.9%, respectively. Most of the CCB were short-acting (SA-CCB). ACEIs were used in 33.8% of diabetic hypertensives. Half of the patients were on maximum or high-dose medications.

**Conclusion:** This study shows evidence of many drawbacks in use of antihypertensive medications in PHC which mandates consideration by the decision makers, practicing physicians, supervisory and educational bodies.

## INTRODUCTION

Hypertension (HTN) is a common health problem in eastern Saudi Arabia. The prevalence, among adult population, has been estimated to range from 4.75% to 25.6% [1,2] and constitutes 1.8-3.8% of total consultations to PHC.[3]

Five main drug classes are used, worldwide, to control HTN. These include diuretics, beta-blockers, calcium antagonists (CCB), angiotensin converting enzyme inhibitors (ACEI), and angiotensin II antagonists (ARB).[4] In some parts of the world, however, alpha-adrenergic blockers, reserpine and methyldopa are also used frequently.[4] Although there is no reliable or consistent evidence yet, that indicates substantive differences between drug classes in their effects on blood pressure, there are important differences in the side-effect profiles of each class.[5,6] In addition, there are important differences in the amount of evidence available from randomized controlled trials on the effect of treatment on morbidity and mortality. A large body of data demonstrated benefits of thiazide diuretics and thiazide/BB combination, while fewer data are available about

calcium antagonists and ACE inhibitors.[4] Recently, doubts are rising towards the single use of BB, especially in the elderly. [7]

There is general agreement on the principles governing use of antihypertensive drugs to lower blood pressure, independent of the choice of a particular drug. These principles include the use of low doses of drugs to initiate therapy, and the use of appropriate drug combinations to maximize hypotensive efficacy while minimizing side effects. [4,8,9]

Thus, selection of appropriate drugs is of great importance because of wide variations in adverse effect, benefit, contraindication, and cost.

Little is known about the current practice of PHC physicians in eastern Saudi Arabia, in terms of choice of medications and their dosages. This study aims to describe and discuss the pattern of prescription of antihypertensive medications in eastern Saudi primary health care, which might help in the identification of an educational need of practicing physicians.

## MATERIALS & METHODS

This study has been carried out, in Qatif district, on the eastern coast of Saudi Arabia, where a population of nearly 500,000 individuals are served by 26 PHC centers (PHCCs).[10]

A weighted, systematic, random sample of 13 (50%) PHCCs were chosen after stratification by the total number of hypertensive subjects registered in each center.

In each sampled center, 50% of registered male and female hypertensives were selected using systematic random sampling. Cases showing no visits in last three months were excluded. Missed medical files and inconsistent medical file numbers were treated as non-responders.

Trained nurses reviewed and collected data from medical records of 320 selected subjects. A pre-defined spreadsheet was used to collect demographic data, duration of HTN, diagnosis of co-morbidity and type and dose of antihypertensive medications used. Data was reviewed and verified by trained physicians working in the same center, and one of the authors.

Categorical data was cross-tabulated, while continuous data was re-coded into groups of interval. Data was tested for normality using kurtosis and skewness standard error. Normally distributed data was tested for significance, using Chi Square [2], Fisher's exact test and Pearson's correlation test, where applicable. Nonparametric categorical data was tested using Mann-Whitney U (MWU) test. Stepwise logistic regression was used to explain the use of high-dose medications. Confidence interval (CI) of 0.95 was calculated for different variables. A p-value of  $< 0.05$  was considered statistically significant. Epi info statistical software version 6.0 was used for data entry, while Statistical Package for Social Sciences version 10 was used for revision and analysis.

Pilot study has been carried out in one PHCC, upon which data collection spreadsheets were modified.

## RESULTS

Out of 320 hypertensive patients 302 (94.4%) were on anti-hypertensive medications, at the time of the study. Table 1 describes the demographic characteristics of these patients. Most (86.5%) of recently diagnosed hypertensives (duration of hypertension less than a year) were on medications, while 94.2% of older hypertensives (hypertension duration of five years or more) were on medications.

Mean  $\pm$  SD number of medications used in male and

female patients was  $1.4 \pm 0.6$  and  $1.3 \pm 0.6$ , respectively. However, no significant difference was noted ( $p=0.11$  MWU.)

Table 2 shows the number of anti-hypertensive medications used. Number of medications correlates poorly with age (Pearson correlation coefficient = 0.058;  $p=.3$ ), in both male and female patients, while correlates positively with duration of HTN (Pearson correlation coefficient = 0.151;  $p=.007$ ), as shown in figure 1.

Five main classes of antihypertensive medications were in use as monotherapy or in combination of two or three as illustrated in figure 2. The characteristics of hypertensive patients using each of these classes differ significantly as shown in table 3.

All diuretics used were hydrochlorothiazide (HCTh). Its total daily dose ranged from 12.5mg to 100mg. However, 89.7% of prescribed HCTh were in doses of 25mg, while 4.3% had a daily dose of more than 25 mg.

Atenolol was the main  $\beta$ -blocker used by all patients using  $\beta$ -blockers, except one who was using propranolol. Total daily dose of atenolol ranged from 25mg to 100mg, out of which 73.4% were prescribed a dose of 100mg.

Captopril was the main ACEI used by all patients using ACEI, except two patients who were using enalapril. Total daily dose of captopril ranged from 10mg to 100mg. Out of these, 95.9% have a daily dose of 75 mg or less.

All CCBs were nifedipine. Three patients (21.4%) were on long acting nifedipine while the remaining 78.6% were on short acting preparations. Total daily dose of nifedipine ranged from 10mg to 40mg. Out of these, 42.9% have a daily dose of more than 20 mg. Total daily dose of methyl dopa ranged from 500mg to 750mg.

Use of high-dose medications was common in 153 (50.7%) patients which show significant correlation with number of medications used (Pearson correlation coefficient = 0.263;  $p<.001$ ) as shown in figure 3, and use of BB and ACEI as shown in table 4. By stepwise logistic regression the use of BB ( $B=3.434$ ; Wald test 48.149;  $p<.001$ ) and no. of medications ( $B=1.101$ ; Wald test 7.891;  $p=.005$ ) were significant predicting variables for the use of high-dose medications, while age, sex, duration of hypertension, diagnosis of DM, place of follow up, use of other classes of medications, level of SBP, and level of DBP were not.

## DISCUSSION

The proportion of HTN patients on non-pharmacological



regimens (5.6%) is, relatively, low. This is in comparison to other studies, which documented a higher range of 9.49% to 38.4%. [11,12,13,14] However, the same finding has been reported in a hospital-based study in Hong Kong. [15] Studied PHCC used to refer most newly diagnosed cases of hypertension to hospital for evaluation and start of treatment. This might explain this low proportion of hypertensive patients on no medication. However, this has to be ascertained, in view of the regionally reported high prevalence of metabolic risk factors in hypertensive patients. [16,17]

The mean number of anti-hypertensive medications is 1.3 and increases with the duration of HTN, which might reflect increasing age, co-morbidities and worsening of control. However, this relationship has been shown widely. [15,18] Patients on monotherapy constituted 64%, which is comparable to data presented from northern Saudi Arabia, Bahrain and few European countries. [19,20,21] However, it is far less than those figures (80.4-82.1%) presented in other parts of eastern Saudi Arabia [22,23] and is far more than those (29.1%-50.8%) presented in Lebanon, Finland, Italy and United States. [12,14,18,24] This relative low proportion of patients on combination therapy might be reflected as lower control of BP, [8,9,25] which might be worsened, further, by the wide variation noticed in practice of different centers.

On the other hand, irrational combinations were found in 5% of the patients, who were using BB and ACEI. [4]

$\beta$ -blockers were the main drug of choice (62.2%) for both male and female patients, whether as single therapy or in combination with other medications. These patients tend to be younger in age, which might be explained by increasing hemodynamic adverse effect at older age. [26] High use of  $\beta$ -blockers is demonstrated, as well, in Bahrain (65.5%) Khobar (55.4%), Finland (51%) and Hong Kong (51%), [18,20,22,23] while lower rates were reported in Lebanon, United States and many European studies (12.9-27%) which show higher use of ACEI, thiazide diuretics or CCB. [11,12,14,18,19] The extensively high proportion of  $\beta$ -blockers used in this study might be attributed to affordability of the medication and relative younger age of our population. However, it is worrying in the context of its diabetogenic effect and the increasing doubts on the use of non-combined atenolol. [7]

Thiazide diuretics were second in popularity (36.3%) in this study, with higher tendency in older age patients and non-diabetics. Apart from higher proportions (42%) reported in Trinidad, remarkably lower proportions were reported in different studies (4%-27.4%). [11,12,14,19] Though a high proportion of patients used thiazide in comparison to other studies, this remains far from the

international recommendation of having HCTh part of all HTN patients, unless contraindicated or other classes are compellingly indicated. [4,8] The tendency for older age might be attributed to its favorable effects in older age. [26] On the other hand, physicians might avoid prescribing thiazide diuretic for their diabetic hypertensives due to its dose-related adverse metabolic effect on glucose and lipids. [6]

One fifth of non-diabetics were using captopril ACEI, while only one third of diabetics were using it. This is far from what is expected and recommended for the use of ACEI in DM-HTN for its protective effect on propagation of diabetic nephropathy. [27] However a similar finding is shown in Bahrain [28] and the United States (39.3%). [14] This low use of ACEI might be attributed to unavailability of single- dose formula, unawareness of the practicing physician to its protective effects or intolerance to cough which is a well known adverse effect of the drug. [29] In such cases, the lack of an alternative angiotensin receptor blockade (ARB) in PHCCs makes the choices even more limited. [4]

CCBs were used in small proportion (4.4%) in comparison to other studies (8%-35.9%). [12,14,19] This low proportion might be related to the concerns of the association of SA-CCB with increased risk of myocardial infarction in elderly and ischemic heart disease patients. [30] Despite the fact that SA-CCB are not approved for management of HTN patients, but LA-CCB, [30] short acting nifedipine is the major CCB used in this study. Inaffordability of LA-CCB and lack of updated information might be reasons for such practice. [31]

Methyldopa was used by only 1.9% of patients, which is similar to figures noted in the United States (1.8%). [14] Its limited use is well understood in view of its frequent CNS adverse effects. [32] This limited use is, however, much lower than figures reported in other studies from Saudi Arabia (4.5%), [22] Bahrain (8.5%), [20] Lebanon (13.6%), [12] Hong Kong (3.5%), [25] and Trinidad (33%). [11]

Dose of anti-HTN medications was high in half of this study population. However, it is BBs which were found to be the main predictor for this practice. This might be influenced by the available form of BB in studied PHCCs, which was a 100 mg tablet of atenolol. This conclusion is further supported by the low use of high dose HCTh (4.3%) and captopril (4.1%) which are available as medium-dose 25 mg HCTh tablets and low-dose 25 mg captopril tablets. This must be considered in view of the association of high doses of anti-HTN medications with higher incidence of metabolic and hemodynamic AE. [33] Variation in the practice of PHCCs is wide, as noticed in

the average number of medications used and proportion of patients on diuretics and CCB. This variation might reflect variable background, variable training of practicing physicians and the absence of common guidelines that addresses these issues. However, these concerns are worth further exploration.

## CONCLUSION

This study shows many drawbacks in management of hypertension, which constitute a major educational need. This includes low use of combination anti-hypertensive medications, low use of ACEI in diabetic hypertensives, use of SA-CCB in place of LA-CCB, high use of maximum or high-dose medications and wide variation between studied practices.

Such pitfalls need to be addressed by decision makers, practicing physicians, supervisors and educational bodies. Putting updated common guidelines into practice with purposeful training, replacing SA-CCB with LA-CCB and affording low-dose formulation of thiazide and atenolol BB are suggested recommendations.

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**Table 1. Demographic characteristics of hypertensive patients included in the study (n=302)**

	Male patients on medications	Female patients on medications	All patients on medications
<b>Sex</b>	105 (34.8%)	197 (65.2%)	302 (100%)
<b>Age (years)</b>			
≤ 39	7 (6.7%)	14 (7.1%)	21 (7.0%)
40-59	50 (47.6%)	113 (57.4%)	163 (54.0%)
60-79	43 (41.0%)	64 (32.5%)	107 (35.4%)
≥ 80	5 (4.8%)	6 (3.0%)	11 (3.6%)
<b>Mean age ± SD</b>	58.1 ± 1.21	55.3 ± 0.87	56.3 ± 0.7
<b>Duration of HTN (years)</b>			
0-1	15 (14.3%)	30 (15.2%)	45 (14.9%)
2-4	32 (30.5%)	57 (28.9%)	91 (29.5%)
5-10	38 (36.2%)	76 (38.6%)	114 (37.7%)
>10	20 (19.0%)	34 (17.3%)	54 (17.9%)
<b>Mean age ± SD</b>	58.1 ± 1.21	55.3 ± 0.87	56.3 ± 0.7
<b>Duration of HTN (years)</b>			
0-1	15 (14.3%)	30 (15.2%)	45 (14.9%)
2-4	32 (30.5%)	57 (28.9%)	91 (29.5%)
5-10	38 (36.2%)	76 (38.6%)	114 (37.7%)
>10	20 (19.0%)	34 (17.3%)	54 (17.9%)
<b>Mean duration of HTN ± SD</b>	6.3 ± 4.6	6.1 ± 4.7	6.3 ± 4.7
<b>Diabetic patients</b>	18 (17.1%)	49 (24.9%)	67 (22.2%)

**Table 2. No. of Antihypertensive medications used in Qatif PHC (n=302)**

	No. of antihypertensive medications				Total	p-value*
	No meds	1	2	3		
<b>Sex</b>						
<b>Female</b>	14 (6.6%)	138 (65.4%)	55 (26.1%)	4 (1.9%)	211 (100.0%)	0.307
<b>Male</b>	4 (3.7%)	67 (61.5%)	33 (30.3%)	5 (4.6%)	109 (100.0%)	
<b>DM</b>						
<b>Non-diabetic</b>	14 (5.6%)	157 (63.1%)	70 (28.1%)	8 (3.2%)	249 (100.0%)	0.808
<b>Diabetic</b>	4 (5.6%)	48 (67.6%)	18 (25.4%)	1 (1.4%)	71 (100.0%)	
	18 (5.6%)	205 (64.1%)	88 (27.5%)	9 (2.8%)	320 (100.0%)	

\*Pearson Chi-Square

**Table 3. Characteristics of hypertensive patients using different classes of antihypertensive medications**

Drug Class	B. Blockers	Diuretic	ACEI	CCB	Methyldopa
No. of patients using each class	199 (62.2%)	116 (36.3%)	73 (22.8%)	14 (4.4%)	6 (1.9%)
Sex					
Male <sup>a</sup>	70 (64.2%)	47(43.1%)	27 (24.8%)	2 (1.8%)	2 (1.8%)
Female <sup>a</sup>	129 (61.1%)	69 (32.7%)	46 (21.8%)	12 (5.7%)	4 (1.9%)
p value*	0.628	0.086	0.575	0.151	1.0
DM					
Diabetic <sup>a</sup>	42 (59.2%)	17 (23.9%)	24 (33.8%)	3 (4.2%)	1 (1.4%)
Non-diabetic <sup>a</sup>	157 (63.1%)	99 (39.8%)	49 (19.7%)	11 (4.4%)	5 (2.0%)
p value*	0.580	0.017	0.016	1.0	1.0
No. of meds					
1	121 (59.0%)	41 (20.0%)	31 (15.1%)	8 (3.9%)	4 (2.0%)
2 <sup>a</sup>	69 (78.4%)	67 (76.1%)	33 (37.5%)	5 (5.7%)	2 (2.3%)
3 <sup>a</sup>	9 (100.0%)	8 (88.9%)	9 (100.0%)	1 (11.1%)	-
p value†	< 0.001	< 0.001	< 0.001	0.519	0.897
Age (years)					
Class users - Mean (±SD)	54.4 (±11.7)	58.8 (±11.6)	56.7 (±12.3)	55.1 (±10.4)	8.8 (±7.2)
Other classes users Mean (±SD)	59.8 (±12.7)	54.7 (±12.5)	56.1 (±12.3)	56.3 (±12.4)	56.2 (±12.4)
p-value‡	0.001	0.004	0.896	0.742	0.510
Duration of HTN (years)					
Class usersMean (±SD)	6.12 (±4.52)	6.97 (±5.09)	6.96 (±4.61)	7.79 (±4.10)	4.50 (±2.17)
Other classes usersMean (±SD)	6.63 (±5.03)	5.87 (±4.40)	6.08 (±4.72)	6.22 (±4.72)	6.33 (±4.73)
p-value‡	0.505	0.092	0.099	0.114	0.460

\*Fisher's Exact Test. †Pearson Chi-Square. ‡Mann-Whitney U

<sup>a</sup> Total number of patients is greater than 302 because some were on more than one class of medication.**Table 4. Hypertensive patients on high doses of antihypertensive medications**

Class	Class users n (%) <sup>a</sup>	Other classes users n (%) <sup>a</sup>	p-value*
Diuretic	53 (45.7%)	100 (53.8%)	.194
B. blockers	146 (73.4%)	7 (6.8%)	<.001
ACEI	21 (28.8%)	132 (57.6%)	<.001
CCB	7 (50%)	146 (50.7%)	1.0
Methyldopa	1 (16.7%)	152 (51.4%)	.117

\*Fisher's Exact Test. †Pearson Chi-Square. ‡Mann-Whitney U

<sup>a</sup> Total number of patients is greater than 302 because some were on more than one class of medication.



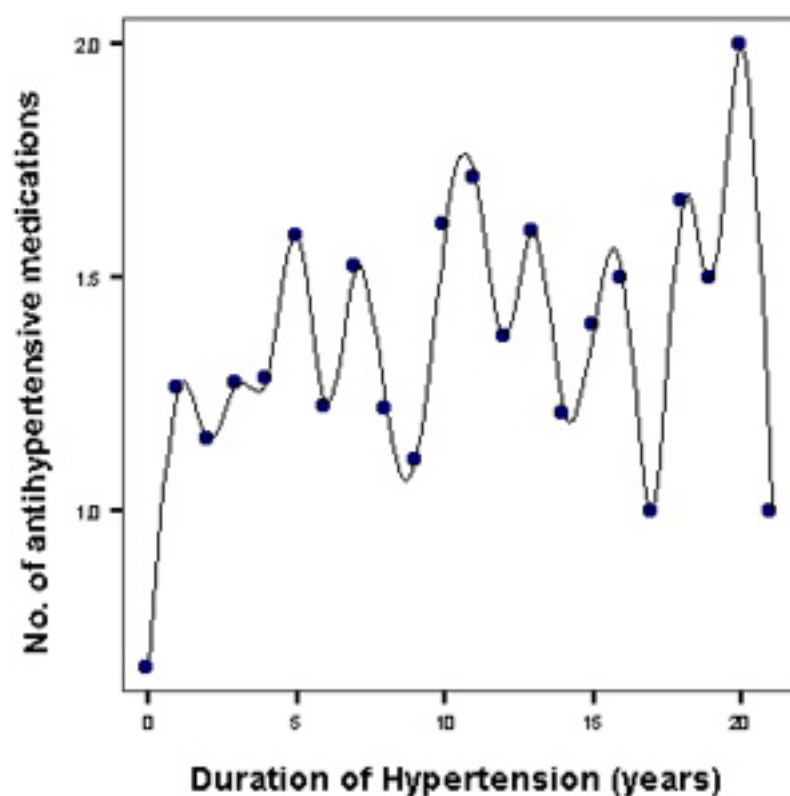
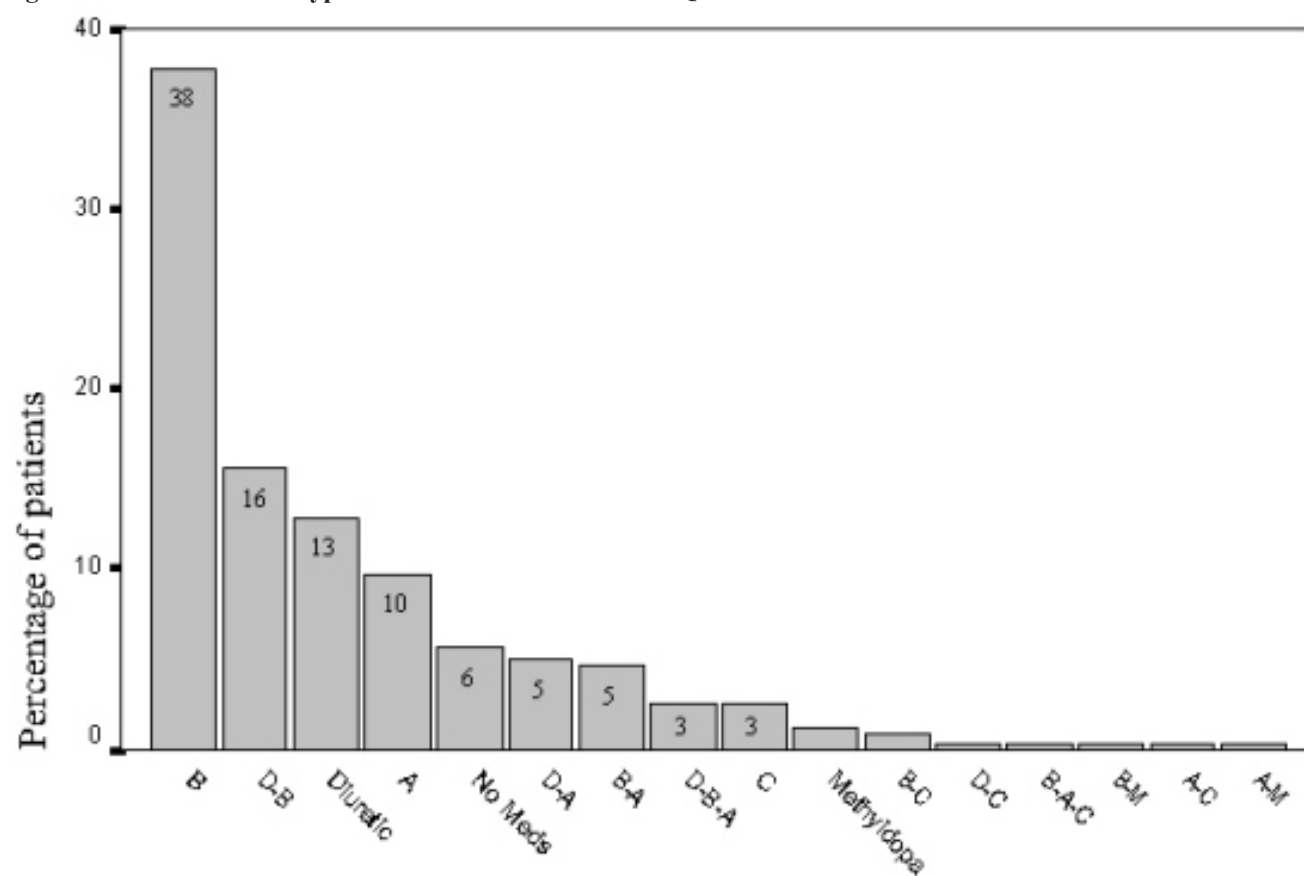


Fig1. Average no. of anti-hypertensive medication in correlation to duration of hypertension

Fig2. Combination of antihypertensive medications used in Qatif PHC

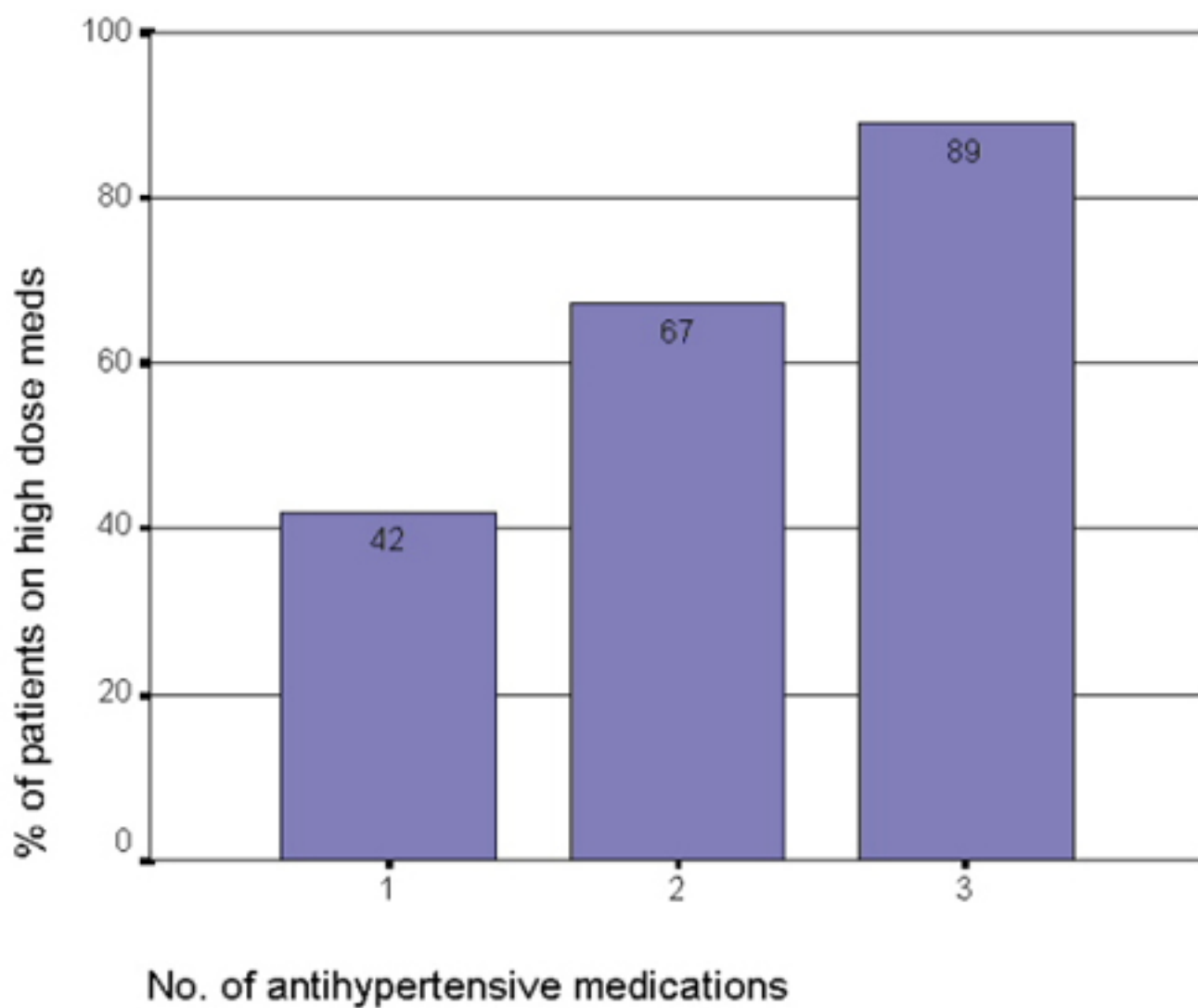


### Combination of Medications

A=Angiotensin Converting Enzyme Inhibitor ; B=Beta Blockers ;

C=Calcium Channel Blocker ; D=Diuretic ; M=Methyldopa

Fig3: Patients on high dose antihypertensive medications.



# The Barriers of Breast Cancer Screening Programs Among PHHC Female Physicians

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**Key words:** Barriers of breast cancer screening and early detection

## ABSTRACT

**Introduction:** While breast cancer is a serious health problem to countries as well, breast cancer screening remains underutilized because of many barriers such as costs, pain due to mammogram procedures, lack of knowledge about the benefits of early screening, and many other barriers such as cultural or social factors. But fighting breast cancer means educating women on the importance of early breast screening and detection for prevention as well as for management. In order to educate the general population on the benefits of breast cancer, the present study was done to identify and describe barriers to early detection of breast cancer.

**Methodology:** This is a survey of 75 female PHC physicians who responded out of the total 79 available female physicians in 43 Primary Health Centers in Al Khobar, Al Dammam, and Al Qatif, Saudi Arabia in 2004 regarding the barriers in implementing of breast cancer screening programs using a specially designed questionnaire which divided into two parts (demographic data, and items regarding barriers in implementing breast cancer screening programs).

**Results and Discussions:** Most of the female physicians were Saudi (65%) with mean age of  $35.93 \pm 7.23$  in years from PHHCs in Al Khobar, Al Dammam, and Al Qatif. The average mean duration of work as physician is 8.82 years and the average duration of work a PHC physician is 8.2 years. 95% of physicians in the study did not undergo post graduate training as compared to literature. The 2 physicians (5%) in the study did not have graduate degrees in family and community medicine but had master's degree in pediatrics (3), obstetrics (1), and gynecology (1). The physicians reported the different barriers which have prevented them from practicing screening programs in PHHCs with the main barrier given as: there was no national screening program (56 physicians), time pressure (55 physicians), physician's lack of training (48 physicians), lack of good communication between physician and patients (46 physicians), there were not enough facilities in the PHHCs (42 physicians), lack of women cooperation and trust (33 physicians), walk-in clinic (4 physicians), and social and cultural reasons (4 physicians). Costs and unavailability of mammography are the main barriers in other countries including the United States of America. Such is not the case in Saudi Arabia since mammography is usually given free to Saudi citizens or is part of the patient's insurance coverage. It was found out that physicians who thought that BC screening is important tended to advice patients to undergo BC screening. Physicians with low scores in BC epidemiology in Saudi Arabia claimed Saudi women are not at risk of BC ( $p=0.04$ ).

**Conclusion:** The main barrier of the BC screening program which may be instituted by PHCs female physicians was unavailability of a national screening program. Other barriers include time pressure, lack of training on the part of the physician, lack of good communication, there were not enough facilities in the PHHCs, lack of women cooperation and trust, walk-in clinic, and social and cultural reasons.

**Recommendation:** Development and institutionalization of breast cancer screening program, massive educational program on breast cancer using multi-media tools and strategies, training and intervention program for PHC physicians on breast cancer including screening and early detection, and inclusion of breast cancer education on the medical curriculum are some of the recommendations arising from the study's results.

## INTRODUCTION

Breast cancer can tremendously affect the women's quality of life. While breast cancer is one of the leading causes of cancer and cancer death among women in the U.S., screening mammography remains underutilized, particularly by women from low-income families. Studies show about one in four women 40 and older have not had a mammogram within the last two years. Nearly 40 percent of low income women have never had a mammogram. Barriers to screening have been often studied, with cost identified as a dominant factor in women's screening decision.[1] But fighting breast cancer means educating women on the importance of early breast screening and detection for prevention as well as for management. Primary care physicians are critical for the recommendation of mammography and clinical breast examinations to their patients.[2]

In a experimental study of an intervention program designed to study the effects of academic detailing in New York's Manhattan and South Bronx primary care physicians' screening recommendation to patients , results showed a statistically significant intervention effect on the recommendation of mammography and clinical breast examination (according to medical audit) by female patients age 40 and over. Intervention group physicians correctly identified significantly more risk factors for breast cancer, and significantly fewer barriers to practice, than did comparison physicians. [2]

In Brunswick, Canada a survey yielded results which showed that physicians had great influence on mammography screening of patients. Having mammography at recommended intervals and clinical breast examinations (CBEs) yearly were significantly associated with having had a physician recommend the procedures ( $P < .001$ ). Rates of screening differed sharply by whether a family physician was physically practicing in the community or not ( $P < .05$ , odds ratio 2.68, 95% CI 1.14 to 6.29).[3]

While breast cancer screening in rural America remains underutilized, barriers to screening mammography in poor, rural areas are marked by significant racial disparities, according to a new study. These barriers include poor knowledge about breast cancer and screening, difficulty accessing facilities, and lack of encouragement and funds to get screened. These factors are particularly striking among Native

The findings of the study of 1,247 women of Hispanic, Chinese, Japanese, and white women on their utilization of breast cancer screening indicated that language barriers that hinder a woman's access to pap smears, mammograms and clinical breast exams create disparities in screening rates.[5]

The independent Task Force on Community Preventive Services recommends strategies which address particular

barriers to screening such as client-related (e.g., knowledge or attitudinal) barriers to screening, access barriers, or provider and system barriers. Some of these strategies are: strong patient reminders, multi-component using media, education, and enhanced access, reducing structural barriers, client incentives, reduced out-of-pocket expense, group education, one-on-one education, and use of mass media.[6]

Older women, in general, have been found to underestimate their risk of these cancers. Fear of cancer diagnosis, or discomfort from or embarrassment during the screening procedures, and other factors, serve as barriers for many women. The first step toward addressing these and other barriers is to recognize that they exist. The importance of physician's recommendation in patient screening decisions was also found. Physician advice and recommendations were the most frequently cited reasons for having had a screening test. In addition, lack of understanding of the need for asymptomatic screening, misconceptions such as the belief that injuries cause breast cancer and limited recognition of the importance of age as a risk factor are some barriers from breast screening use. Physician interventions alone will not be adequate to address these issues. Culturally relevant community outreach and education projects are also necessary.[7]

The objective of the study was to identify and describe barriers to early detection of breast cancer.

## METHODOLOGY

This is a survey of 75 female PHC physicians who responded out of the total 79 available female physicians in 43 Primary Health Centers in Al Khobar, Al Dammam, and Al Qatif, Saudi Arabia in 2004 regarding the barriers in implementing of breast cancer screening programs.

A specially designed questionnaire divided into two parts (demographic data, and items regarding barriers in implementing breast cancer screening programs) was used as data gathering tool.

A pilot study was conducted using the tools of data collection to assess the reliability of the research tool which was found to be highly reliable (Cronbach a coefficient of 0.77). Face validity and content validity were also established with the aid of experts on the field in Saudi Arabia. The Statistical Package for Social Science (SPSS) version 10 was used for data entry and analysis and decided to use a p value of  $<0.05$  level of significance (with 95% confidence interval). The study followed strict ethical considerations.



## RESULTS & DISCUSSION

Selected demographic variables of the respondents were shown in Table 1. Most of the physicians were Saudi (65%) with mean age of  $35.93 \pm 7.23$  years old. It indicates that female young Saudi physicians are working in PHCs in the 3 cities of Al Khobar, Al Dammam, and Al Qatif. The average mean duration of work as physician is 8.82 years and the average duration of work a PHC physician is 8.2 years. The respondents' mean ages, duration of medical practices in general and PHCCs in particular, are lower than what is in literature. 8,9,10,11 Most of the physicians in the study (95%) did not undergo post graduate training as compared to literature wherein 46% are family physicians. The 2 physicians (5%) in the study who had master's degree in pediatrics (3), obstetrics (1), and gynecology (1) were also working as general physicians.

The physicians indicated the different barriers which may prevent doctors from practicing screening programs in PHHCs. The main barrier given was that there was no national screening program (56 physicians), time pressure (55 physicians), physician's lack of training (48 physicians), lack of good communication between physician and patients (46 physicians), there were not enough facilities in the PHHCs (42 physicians), lack of women cooperation and trust (33 physicians), walk-in clinic (4 physicians), and social and cultural reasons (4 physicians). Some studies found in literature have common barriers to the present findings, such as: fear of diagnosis (lack of trust), tests as unnecessary, lack of cooperation, and social and cultural beliefs, lack of knowledge of breast cancer. Some other studies indicated logistics or costs<sup>1</sup> and pain to the patients<sup>7</sup>, geographic area, education level, and health status, infrequent clinical breast examinations as part of regular care, unavailability of mammography services, and lack of time for patients from their jobs are some of the barriers for recommending mammography and screening.<sup>6,14-20</sup> Costs and unavailability of mammography are the main barriers in other countries including the United States of America. Such is not the case in Saudi Arabia since mammography is usually given free to Saudi citizens or is part of the patient's insurance coverage

The reason for majority of the physicians (68%) to advice patients to do BC screening comes from their knowledge of the importance of BC screening. The physicians who did not advice their patients to do BC screening (32%) gave the lack of national screening program on breast cancer (n=24) as the main reason for not doing so; a not good enough reason to prevent physicians from trying to educate the women about BC or advice them to do breast cancer screening wherever they can access it. Other

reasons were the same as reported in the literature. Those who were found to have low scores in epidemiology in Saudi Arabia claimed Saudi women are not at risk of BC ( $p=0.04$ ). Only 6 (25%) reported that women do not come for breast problems.

## CONCLUSION

The results of the study give the following conclusions:

The main barrier of the BC screening program which may be instituted by PHCs female physicians was unavailability of a national screening program. Other barriers include time pressure, lack of training on the part of the physician, lack of good communication, there were not enough facilities in the PHHCs, lack of women cooperation and trust, walk-in clinic, and social and cultural reasons.

## RECOMMENDATIONS

Based on the conclusions of the study, the following are recommended:

1. Development and institutionalization of breast cancer screening program
2. Massive educational program on breast cancer using multi-media tools and strategies for the mass media.
3. Training and intervention program for PHC physicians on breast cancer including screening and early detection.
4. Inclusion of breast cancer education on the medical curriculum.
5. Availability of enough breast cancer screening utilities and machines for the use of women

## ACKNOWLEDGEMENTS

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**Table 1. Distribution of Female PHHC Physicians in Al Khobar, Al Qatif and Al Dammam Cities According to Selected Demographic Variables; 2004**

Demographic Variables	PHC Physicians	
	No.	%
Nationality		
1. Saudi	149	65.3
2. Non-Saudi	26	34.7
Qualification		
Bachelor	70	93.3
Master	5	6.7
Demographic Variables	Mean $\pm$ sd	
Age by year	35.93 $\pm$ 7.23	
Duration of practice PHHC in (yrs)	8.82 $\pm$ 5.4	
Duration of Practice in (yrs)	8.2 $\pm$ 6.6	

**Table 2. Barriers of Breast Cancer Screening Program Implementation - as reported by PHHC Physicians in AL Khobar, Al Dammam, and Al Qatif; 2004**

Barriers	Frequency	%
<b>Institutional</b>		
· No national screening program	56	75
· Not enough facilities in the PHCCs	55	73
· Walk-in clinic	4	5.3
<b>Inadequacy of Human Resources</b>		
· Time pressure due to workload	55	73
· Lack of training	48	64
<b>Inadequacy of communication opportunities</b>		
· Lack of good communication	46	61.3
· Less understanding of benefits of the screening program	8	10.7
<b>Misunderstanding and misconceptions regarding BC</b>		
· Lack of women cooperation and trust	33	44
· Social and cultural reasons	4	5.3

# Clinical study of lipid profile in diabetic patients

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**Key words:** lipid profile, diabetes mellitus, hypertriglyceridaemia

## ABSTRACT

**Objective:** to know the incidence of hypertriglyceridaemia, its age and sex distribution and prevalence in NIDDM and IDDM and also to know the relationship between the glycaemic control and degree of hypertriglyceridaemia and incidence of complications of hypertriglyceridaemia in diabetes mellitus.

**Patients and Methods:** one hundred and twenty patients of well-established diabetes mellitus were included in the study. All patients underwent the following investigations:

1. Base line investigations like blood CP with ESR, Blood urea, urine RE, ECG and x-ray chest.
2. Planned investigations: These included fasting and 2 hours post prandial blood glucose estimation, serum electrolytes, serum creatinine, serum amylase, uric acid, LFT's, TFT's, ETT and abdominal ultrasound to look for liver texture and for any evidence of fatty change; morphology, texture of kidney and pancreas and other abdominal viscera.
3. Total lipid profile which included: Total fasting lipids, Total fasting triglycerides, Total fasting cholesterol, HDL cholesterol and LDL cholesterol.

**Results:** The commonest finding was hypertriglyceridaemia both in insulin- and non-insulin dependent diabetic patients. It was more so in non-insulin dependent diabetes mellitus (70%) as compared to insulin-dependent diabetics (30%).

**Conclusion:** Hypertiglyceridaemia is the most common lipid abnormality in diabetes mellitus, which is more common in NIDDM than IDDM.

Early diagnosis, good glycaemic control and dietary modification are usually enough for prevention and treating hypertriglyceridaemia in diabetes mellitus.

## INTRODUCTION

Diabetes is a common endocrine disease and its complications are major stimuli for the enhancement of efforts towards its control. There are currently 119.2 million people with type 2 diabetes worldwide, and the number is expected to increase to 212.9 million, in the year 2011 [1].

Type 2 diabetes is the most prevalent form of diabetes and is due to the combination of insulin resistance and defective secretion of insulin by pancreatic b-cells [2].

Diabetes mellitus is a major risk factor for morbidity and mortality due to coronary heart disease (CHD), cerebrovascular disease, and peripheral vascular disease. Metabolic control and duration of type 2 diabetes are important predictors of coronary heart disease (ischaemic heart disease) in elderly subjects, particularly in women [3].

Hyperglycaemia affects biochemical parameters and influences the progression of coronary heart disease and mortality rates in diabetic patients. Aggressive treatment to control hyperglycaemia is much more effective in

reducing the number of complications than standard treatment [4, 5].

The term hyperlipidaemia refers to an increase in concentration of one or more plasma or serum lipids, usually cholesterol and triglycerides and the term dyslipidaemia is used for either an increase or decrease in concentration of one or more plasma or serum lipids. Type 2 diabetic patients have markedly increased risk of coronary heart disease than similarly dyslipidaemic non-diabetic subjects [1].

Most recently, results of the Strong Heart Study indicate that LDL cholesterol is an independent predictor of cardiovascular disease in patients with diabetes, along with age, albuminuria, fibrinogen, HDL cholesterol (inverse predictor), and percent body fat (inverse predictor) [4]. Atherogenic dyslipidaemia (diabetic dyslipidaemia) is characterized by 3 lipoprotein abnormalities: elevated very-low-density lipoproteins (VLDL), small LDL particles, and low high-density lipoprotein (HDL) cholesterol (the lipid triad) [5, 6]. Despite the high and widespread prevalence of dyslipidaemia among people with and without diabetes, only 2.2 % [7] of adults without diabetes and 32 % [8] of diabetic patients were receiving treatment with diet, exercise, or drugs to reduce lipid

levels and less than one third of patients with established cardiovascular disease received such treatment [7].

Furthermore, among those who were being treated, only 1 % reached the American Diabetes Association (ADA) goal of LDL < 2.6 mmol/L (100 mg/dl) [8].

The aims of the present study were:

1. To know the incidence of hypertriglyceridaemia, its age and sex distribution and prevalence in NIDDM and IDDM.
2. To know the relationship between the glycaemic control and degree of hypertriglyceridaemia and incidence of complications of hypertriglyceridaemia in diabetes mellitus.

## PATIENTS & METHODS

The sample of this prospective study was conducted in the department of medicine in King Hussein medical center over a period of two years.

After institutional ethical committee clearance and written informed consent was taken, one hundred and twenty patients of well-established diabetes mellitus were included in the study.

Patients were selected for study from among patients attending the Outpatient Diabetes Clinic.

The selection criteria were:

1. Every patient of these one hundred and twenty cases had established diabetes mellitus.
2. Systemic diseases like CRF, nephrotic syndrome, myxoedema, SLE were excluded from the study on the basis of history, clinical examination and relevant investigations.
3. Diabetic patients taking drugs like beta-blockers, oral contraceptive pills, thiazide diuretics, corticosteroids, or cimetidine for any reason, were also excluded.
4. Smokers and alcoholics were also excluded.

Those patients who agreed to participate in the study were informed of the program and schedule of the study.

The patient's personal data, medical, family, dietary history and daily activities were recorded. Height and weight for BMI calculation were also measured and recorded using a data collection form.

After 12 hours of fasting (overnight) a sample of blood was collected into appropriate tubes and taken to Chemical Pathology Laboratory for analysis.

All patients underwent the following investigations:

1. Base line investigations like blood CP with ESR,

Blood urea, urine RE, ECG and x-ray chest.

2. Planned investigations: These included fasting and 2 hours post prandial blood glucose estimation, serum electrolytes, serum creatinine, serum amylase, uric acid, LFT's, TFT's, ETT and abdominal ultrasound to look for liver texture and for any evidence of fatty change; morphology, texture of kidney and pancreas and other abdominal viscera.
3. Total lipid profile which included: Total fasting lipids, Total fasting triglycerides, Total fasting cholesterol, HDL cholesterol and LDL cholesterol.

## RESULTS

The total number of patients included in the study was 120. All of them were known diabetics. The female to male ratio was 2:1.

Regarding the age group, the majority of our patients were in the age group ranging from 31-60 years. Only 14% were above the age of 60 years.

Regarding the type of diabetes, we found that 15% had IDDM and 85% NIDDM. Regarding the duration of diabetes mellitus 78% of the cases had diabetes mellitus for the last 7-17 years.

The dietary intake in 45% of patients was complex carbohydrates and high fibre diet. 25% had a liking for a fat enriched diet of which females were the majority. 15% were following no dietary restrictions.

Regarding physical activity, 60% of patients had a strict sedentary life pattern, with the vast majority of female patients, restricted to their house keeping. Very few patients were participating in sports.

Body mass index was evaluated by the following formula in all patients. BMI = weight in kilogram / height in meters[9]. 40% had normal body mass index, 15% below normal, while 45% had a body mass index above the normal range.

The triglyceride levels were raised only in 58% patients. 29% patients had only raised serum triglyceride without any clinical evidence of hyperlipidaemia.

Regarding the fasting blood glucose it was found more to be more than 140 mg/dl in 85% of cases. The majority of patients had poor to uncontrolled glycaemic levels. Renal function tests i.e. blood urea, serum creatinine and electrolytes were carried out to rule out any renal pathology, but they were found within the normal limits. Liver function tests, thyroid functions tests were normal. In general 44% of the patients had normal total serum lipids, while 56% showed raised levels. Out of 56%, 46%



had serum lipid levels in the range of 1000-1500 mg/dl, while the remaining 10% of patients had a level in the range of 1500-2500 mg/dl.

Total fasting serum cholesterol was found normal in 80% patients. 20% had raised serum cholesterol in the range of 251-300 mg/dl. All of these 20% of cases also had triglyceride levels more than 200 mg/dl, so fulfilling the hyperlipidaemic criteria of National cholesterol education programme of the USA.

LDL – cholesterol was found to be normal in 80% of cases while 20% showed a raised level. HDL – cholesterol in 15% of cases was less than 40 mg/dl, who were at a higher risk of IHD, while it was found above 40 mg/dl in the remaining 85% cases.

Hypertriglyceridaemia was found both in IDDM and NIDDM patients. It was more in NIDDM (70%) than IDDM (30%) patients.

In IDDM the majority of patients had mild to moderate hypertriglyceridaemia. The same was the case in NIDDM patients.

In our study, we found that 24% had ischaemic heart disease as evidenced by serial ECGs

## DISCUSSION

Patients with diabetes can have many lipid abnormalities, including elevated levels of very low-density lipoprotein cholesterol (VLDL-C), low-density lipoprotein cholesterol (LDL-C), and triglycerides; and low levels of high-density lipoprotein cholesterol (HDL-C) [10]. These patients have a preponderance of abnormalities in the composition of LDL-C (smaller, denser particles), which increase atherogenicity even if the absolute concentration of LDL-C is not significantly increased. The combination of elevated levels of small, dense LDL-C particles and high triglyceride levels represents a lethal cholesterol abnormality known as pattern B.

About 20% of patients with type 2 diabetes have hypertriglyceridaemia or low HDL-C levels [11]. These abnormalities, as well as high VLDL-C levels and high total and VLDL-related triglyceride levels, are powerful risk indicators for CAD in patients with type 2 diabetes. In addition, the combination of elevated total cholesterol level, hypertension, and uncontrolled hyperglycaemia is implicated in the development of nephropathy.

In a study done in Russia, dyslipidaemia was detected in 84% diabetic patients [12]. In one European study 40% were hyperlipidaemic according to the criteria of National cholesterol education programme, (cholesterol

and triglyceride greater than 200 mg/dl). An additional 23% showed hypertriglyceridaemia [13]. In another study hyperlipidaemia was found in 28% of diabetic patients [14].

In our study total fasting lipids of greater than 1000 mg/dl were found in 56% and fasting hypercholesterolaemia and increased LDL cholesterol in 20% of the patients. The values of cholesterol and LDL cholesterol declined from younger to older ages; so these results are in conformity with the previous study [15].

Hypertriglyceridaemia was found to be the commonest dyslipidaemia in this study i.e. 58%; greater than the previous studies. The majority of patients in our study were type II diabetics (70%) as compared to type I (30%). Winocour et al, has shown 40% hyperlipidaemia in IDDM patients. Hypertriglyceridaemia was found predominantly in all the cases while a few had combined hyperlipidaemia, pure hypercholesterolaemia however was not observed in a single case [16].

Hypertriglyceridaemia, which is comparatively more common in NIDDM than IDDM [17] is probably due to increased production and reduced clearance of rich lipoproteins-VLDL [18]. Amongst the NIDDM patients hypertriglyceridaemia is depending upon the variation in the apo E gene, because significantly higher level of VLDL – triglycerides have been found in patients with epsilon 2 heterozygote than in those without the epsilon 2 allele [19]. It is further interesting to note that even the 1st degree relatives of NIDDM cases have dyslipidaemia in general and hypertriglyceridaemia in particular [20].

In the number of European studies dyslipidaemia is more common in males, beyond 35 years of age [21]. But in our study it is more common in females. One factor responsible for this is that they are confined to their housekeeping without any active physical activity.

Exercise has potential benefits for these patients. It not only has a lipid lowering effect but it also potentiates the effect of diet or drug therapy on glucose metabolism in NIDDM patients [22]. In our study only 24% were in the habit of taking regular exercise.

The poorer the glycaemic control, the higher the degree of hypertriglyceridaemia. This relationship can be explained by the glucoregulatory and lipolytic actions of insulin, and defect in this can lead to dyslipidaemia more so in NIDDM patients [23]. If good glycaemic control is achieved then not only the size of VLDL particle is reduced but also increases in the concentration of apo – B protein fraction of VLDL takes place. These changes in turn lead to increased clearance of VLDL particles and ultimately dyslipidaemia reverts [24]. In one study 28% of diabetic patients had

hyperlipidaemia with a poor glycaemic control as defined by a glycated hemoglobin value of more than 10% [14]. In our study 58% of the total patients had poor glycaemic control as assessed by serial 2 hours post prandial glucose estimation according to WHO criteria [25]. All of these showed mild to severe dislipidaemia.

In WHO criteria, levels less than 150 mg/ dl were taken as good, between 150-200 mg/ dl as permissible and above 200 mg/dl as poor glycaemic control.

Apart from the blood glucose estimation glycaemic control can be monitored by estimation of glycated HbA1C, glycated fructosamine and glycated serum albumin. Glycated HbA1C comprises 4-6% of the total haemoglobin. Levels less than 10% reflect a good glycaemic control over the preceding 8-12 weeks [26]. However, glycated serum albumin can be a more reliable marker of short term glycaemic control in IDDM than fructosamine [27].

Diabetic patients with hyperlipidaemia frequently develop atherosclerosis. Superoxide, which is present in diabetic patients with hypertriglyceridaemia, is suspected to play an important role in the initiation of this atherosclerosis. [28] Other atherogenic factors specific to diabetes mellitus, however are concomitantly present which potentiate the process of atherosclerosis.

Both low HDL and high triglyceride levels are frequently associated with other coronary risk factors. Correction of both, may reduce coronary artery disease risk without fear of adverse side effects. [29]

In various studies the plasma triglyceride level exceeding 3 mmole/L (270 mg/dl) is universally accepted as hypertriglyceridaemia in diabetes mellitus [14] and the greater levels are positively correlated with the increased risk of coronary artery disease [30,31]. It is noteworthy that triglyceride levels greater than 2 mmol/L are the angiographically proven marker of coronary artery disease [32].

In long term follow up, for more than 10 years, patients with impaired glucose tolerance tests and or frank diabetes mellitus, it was observed that the mortality rate with respect to IHD was remarkably high in those having moderately severe hyperlipidaemia than those with border line [33]. Silent myocardial infarction which is seen in 15-24% of patients with diabetes mellitus [34] becomes even more common in the presence of long standing moderate to severe hyperlipidaemia. In our study 24% had ischaemic heart disease. Their lipid profile showed mild to moderate hypertriglyceridaemia (200- 400 mg/dl, while total cholesterol, LDL cholesterol and HDL cholesterol were all normal.

## CONCLUSIONS

Hypertriglyceridaemia is the most common lipid abnormality in diabetes mellitus, which is more common in NIDDM than IDDM.

Early diagnosis, good glycaemic control and dietary modification are usually enough for prevention and treating hypertriglyceridaemia in diabetes mellitus.

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# Development of a Community-based Care System Model for Senior Citizens in Tehran

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**Key words:** Health System Model, Community-based care, Senior Citizen.

## ABSTRACT

**Objectives:** In Iran a considerable percentage of old people “living” in society need to receive specialized health services. In order to respond to these care needs, developing and implementing health and social care systems with consideration of relevant factors such as existing resources and facilities; social and cultural issues and characteristics of each groups of elders(healthy elders, frails, home-bound) seems to be necessary.

**Methods:** At the development phase of the care model in this study methodological triangulation is used including: 1. Comprehensive review of current and related literature. 2. Conduction of an ethnographic study on a number of Tehranian elders and their families. 3. Seeking opinions of a group of experts on this issue using nominal group technique, and analysis and synthesis of the collected data were employed to develop a community based care system for elders.

**Results & Conclusions:** The preliminary results of employing this care system and examination of expected outcomes such as enhancing quality of life and hope in elders, reflects the efficiency of this system, although further complementary studies and particularly cost benefit analyses are strongly recommended.

## INTRODUCTION

As we know in recent decades human societies have been faced with a great challenge, that is the unprecedented number of elderly people as a consequence of more healthy environments and the lowering of mortality rates. It is estimated that in 2020 one billion of the world's population will be older adults and 60% of this number would live in developing countries and unfortunately these societies are not prepared to encounter the aging phenomenon and its social, economic and medical repercussions. (Bartz, 1996)

Today, the great challenge of health and social care delivery systems is how to optimize the health status of elders. (Eliopoulos, 1999)

Delivery of effective and efficient nursing care to any group of clients depends on recognition of their uniqueness and conduction of comprehensive health care

needs assessment. Nursing as an academic discipline has adopted a holistic approach to the clients; their environment and any other influencing factors. (ANA, 1982)

Recently the philosophy in gerontological nursing has been changed dramatically and this discipline has adopted a health promotion and disease prevention orientation. As a result gerontological nursing has a great emphasis on active and healthy aging and autonomy and self dependency of elders. (Ebersol, 1990)

In recent years a variety of system models for providing community based health care services to the elderly has been envisioned and implemented in developed countries, which meet the special care needs of different groups of elders. Day care centers, home health care services, skilled nursing care facilities, nursing homes, congregate housing and hospice care are some of these services. (Stone, 1999)



On the other hand in Iran, a developing country, provision of specialized health and social services to elders in many extents has been ignored and only in the end stages of elders' life this issue goes under consideration by one of the following traditional ways: A) provision of informal home care by elder's relatives and lay caregivers B) signing a contract between the families and private home care agencies that in many cases don't have required licenses and primarily with profit incentives deliver their under standard services. C) transfer of dependent elder to a nursing home as last and worst resort due to exhaustion of limited resources in family caregivers. (Rastegarpour, 1999)

Today it is strongly recommended that all needed health services to aging people should be provided to them in their residential places and in the community. The reasons for this emphasis are as follows:

It is known that elders are more comfortable and feel at ease while are in their homes; and many studies have showed that community based and home health care are the more cost beneficial than hospital based services.

In Iran, there is a considerable percentage of old people 'living' in the society who need to receive specialized care and health services. In order to respond to these needs, planning and implementing health and social care systems with consideration of factors such as existing and available resources and facilities (financial and manpower); social and cultural issues and special characteristics of various groups of elders (physically fit, frail, home bounds) seems to be necessary.

Self reliance and ability to continue independent living in their houses is very important to elders but many factors such as deteriorating health condition, declining economic status, dominant negative viewpoints in community about aging and aged people (e.g. ageism) and ever changing policies and practices of health care delivery systems discourage fulfillment of this ideal situation. Ageing in place is a term coined in gerontology to highlight the significance of capacity in elders to live independently in the community. It means that elders remain in their residential places as long as possible and receive appropriate health and social services (Kreuger1990). Ageing in place means that instead of removing elders to nursing homes and residential institutions; they would remain in their homes and have their surroundings undergo modifications to respond to their changing health needs.

Nowadays, organizations that are responsible for providing community based health care services are faced with a great challenge; that is the development and implementation of cost benefit service packages for elders which prolong the stay of elders in community

and meanwhile ensure that their life quality remains at acceptable levels.

Health systems in many countries implemented varieties of community based programs, which have been specifically developed for elders. Home care services, community based health care programs, respite care, day care, senior centers, home maintenance programs, home meal delivery; transport services are some of these programs. (Broadhead, 1983)

Social support is the most important predictive variable that saves the elders from premature movement to residential facilities. Studies show that in almost all countries a large part of home health services and social support are provided to elders by their families and informal caregivers. To ensure that crippled and frail elders would receive necessary health and social services cooperation of these families as main resources of informal care giving, with local formal authorities, is crucial.(US Senate Special Committee on Aging , 1988)

## MATERIALS AND METHODS

It should be mentioned that our complete study consisted of two consecutive qualitative (to yield a model of community based health care system for Tehranian elders) and quantitative (in order to determine its effectiveness) studies. In this article the qualitative part has been discussed.

In this stage of study (developing a community based care system model) methodological triangulation was used for collection, analysis and synthesis of relevant data. Triangulation is the use of multiple methods in the study of the same phenomenon. The phenomenon investigated is usually complex, like the human ability to cope with chronic illness, and requires in depth study from a variety of perspectives to capture reality (Morse , 1991).

The three data collection and analysis methods included:

1. Conduction of a comprehensive review of literature.
2. Ethnography on a number of elders living with their families in an urban area in the 13th district of the city of Tehran, Iran, to achieve indepth and valid information regarding their lifestyles , health beliefs, health needs and their life situations.
3. Obtaining expert (healthcare administrators and policy makers , faculty members of medical and nursing schools, geriatricians, psychiatrists, nurses and social workers, who had acquaintance and expertise in service delivery to elder clients) opinions using Nominal Group Technique.

By combination and synthesis of these findings as building

blocks and rudimentary elements, we proposed a model for a community based health care delivery system for elders in an urban area in Tehran.

As mentioned above, in order to collect data about some relevant issues, such as: lifestyles, health status, health beliefs, and mode of health system usage by elders dwelling in 13th district of Tehran a micro ethnographic study was conducted.. Ethnography, by definition, is a means of studying groups of individuals' life ways or patterns, and micro or small scale ethnography is used for study of similar social situations that in this study social situation comprised of: lifestyles, health beliefs and health behaviors of some elders living with their families. Behavioristic approach was used in data treatment and interpretation of findings. As we know in this approach the researcher is most interested in revealing recurrent patterns in observed behaviors. This approach is deductive and use of this mode of interpretation deviates radically from the intent of other interpretations, which rely solely on induction. (Streubert & Carpenter 1999 )

The main objective for conduction of ethnographic study was to substantiate the following preselected categories of data:

- Health beliefs
- Health service usage
- Attitudes and practices about health attainment and maintenance
- Familial and social relationships
- Social and recreational activities
- Daily living activities
- Attitudes and practices about sleep and rest
- Nutritional habits
- Physical exercise
- Economical and welfare situations
- Spiritual beliefs and practices

Because we had interested in collecting data about the above mentioned categories, in both sexes, and in both healthy and unhealthy conditions. Thus we adopted a purposive sampling method as follows:

- a) Sampling from elders with good physical and mental health condition (who had not been under treatment for acute health conditions and were self reliant in their ADLs) was done using health assessment records in seniors' cultural centers of the 13th district municipality. Data collection by means of unstructured interviews and participant observation - as two usual data collection methods - was conducted from 18 elders (12 men and 6 women) until data saturation was accomplished.
- b) Participation of 13 unhealthy elders in the study (8 men and 5 women) was accomplished through nursing home care service deliveries and follow-ups.

If the need for receiving such services was deemed no longer necessary but the required data were not acquired, an informed consent was obtained about continuation of friendly home visits which in many cases have been welcomed by elders and their families. To adhere to principles of making the ethnographic record (language identification principle, verbatim principle, concrete principle) a large portion of interviews and observations were audio-visually taped. Brief field notes were taken instead of tape-recording if the latter seemed inconvenient or ethically inappropriate from viewpoints of researcher or participants. After each session of data collection, and as soon as possible content analysis of documents for identification of recurrent patterns, discovery of cultural themes and taking a cultural inventory, were done. To verify the confirmability of findings, feedback from participants was obtained and accuracy of conclusions to a great extent was acknowledged by elders.

On the other hand and in order to find some other characteristics and specifications of the system we sought the opinions and suggestions of experts in this field using Nominal Group Technique. Some justifications for using NGT are as follows.

The Nominal Group Technique is a good way of getting many ideas from a group. It has advantages over the usual committee approach to identifying ideas. Group consensus can be reached faster and everyone has equal opportunity to present their ideas. NGT sessions have predetermined steps as follows:

- silent generation of ideas in written form
- recorded round-robin listing of ideas on a chart
- discussion and clarification of each idea on the chart
- preliminary vote on priorities
- discussion of preliminary vote
- final vote on priorities ( Delbecq A.L etal 1971)

Sampling from experts in elderly health and social services was purposive and with consideration of factors such as: expertise, experiences, motivation and willingness to share ideas and contribute to this study were sent a letter and invitation to participate to NGT sessions.

List of invited experts to the panel were as follows:

- Assistant Professor of nursing department in university of social welfare and rehabilitation (USWR)
- Psycho- geriatrician
- Hospital manager and assistant Professor of USWR
- Deputy of research in USWR
- Deputy of treatment and rehabilitation in USWR

- PhD in sociology
- Representative of family office in deputy of health in ministry of health and medical education
- PhD social worker
- Manager of a comprehensive rehabilitation center
- Manager of comprehensive rehabilitation day center for elders
- Representative from deputy of rehabilitation in Behzisti (Welfare) organization
- Master degree in rehabilitation management
- Head of community-based rehabilitation headquarter in USWR

The main topics for discussion by the panels was determined with consideration of relevant literature and consultation with experts in this field. These topics were determined as:

- Target groups of elders
- Composition of health care team in that system
- The most necessary services
- Geographic location
- Time and frequency of service delivery by the system
- Cost of services and how to compensate expenditures
- Manager and coordinator of services and his /her job description
- Cooperation with elders families, volunteers and NGOs
- Evaluation about efficacy of services
- relationship between this propositional system and other pre-existing health and social care systems

## FINDINGS

### *Target group:*

1. Frail elders (elders around 70 years, with an acute or chronic illness and a decline in ability to perform their ADLs).
2. Elders with low socio-economic status with fair, moderate or poor health conditions

### *Health care team:*

1. Nurse, general practitioner, social worker
2. Nutritionist, psychologist, volunteer persons , healthy elders and families
3. Referral of elders to specialist physicians and rehabilitation centers. These services will be provided offsite.

### *Important deliverable services:*

1. Routine and periodic assessment of elders' health

statuses and filing these health records.

2. Teaching, giving information and counseling elders and their families about health, family problems, legal issues and so on.
3. Referral of elders to other health, rehabilitation and relief facilities and follow-up (Here the nurse or social worker acts as case or care manager)

### *Geographic location:*

1. Initially one or two community-based care centers should be founded as pilot centres and after troubleshooting and optimization of their services at least one center should remain in every area zone of municipalities.
2. The panel recommended that the community based centers should be located in pre-existing health and social service foundations such as hospitals and clinics, behzisti centers, community centers in state sector and likewise in private ones such as non governmental senior centers and charity centers. Thus the activities of these centers would be very cost beneficial.

### *Name of centers (with consideration of their philosophy, mission and approaches):*

The following titles (in order of priority) were recommended for the center:

1. seniors' health house
2. community based care center for senior citizens
3. institute of health and social services for the worldly-wise

### *Time of service delivery (hour per day and day per week):*

1. It was recommended that the predicted services should be delivered around the clock, seven days per week, for assurance of accessibility of services.
2. The panel emphasized precise scheduling of presence and activities of all workers in these centers based on predetermined tasks ( i.e. educational , research, consultations, health assessment and delivery of community based services, staff meetings) in morning, evening and night working shifts.

### *Expenditures and revenues:*

1. In order to cover part of expenditures; all concerned and beneficiary authorities (i.e. ministry of health, behzisti organization, mayoralty, state and private insurance companies) should support and financially contribute to capital and up keeping expenses.
2. The panel suggested the following policies as safeguard measures that allow community based

centers to render their services cost effectively.

3. More emphasis on semiskilled, lay and volunteer workers than on specialists and experts; contribution and cooperation of these centers with universities in topics such as: population lab studies and surveys; practicum and field work of social and medical sciences students; acting as suitable environments for service learning; part of the services in these centers will be delivered by instructors and faculty members of universities.

#### *Coordination and management of activities:*

1. Preferably a masters degree public health nurse with due experience in this field would be appointed as manager and coordinator of the center. The head of his/her activities would be: coordination of routine works in the center (educational, research and service delivery); cooperation with authorized program planners and policymakers concerning development, expansion and extension of services in the future.
2. The director of the center could be a general practitioner who has spent a short course on geriatric medicine and has practical experience in service delivery to older adults. He/she would coordinate necessary referrals from the center.

#### *Participation of elders' families, volunteers and NGOs:*

1. It would be necessary that families and informal care-givers be enabled and empowered through education, counseling and substantial and moral supports.
2. Creation and fortification of interrelationships with non-governmental organizations and development and implementation of joint programs.

#### *Evaluation of activities in the center:*

1. Examination of elders and their families' quality of lives before and after service utility.
2. Any improvement in informal care-givers and family's participation in direct and indirect care-giving activities and self sufficiency of elders in their activities of daily living.

Ethnographic themes comprise another part of findings in this study, which assisted researchers in needs assessment and thus allowing for tailoring of services in the health system model. After content analysis of participant observations and interviews according to qualitative data treatment and analysis principles, the following categories emerged that will be used for fine tuning of activities in the speculative health system.

- Cultural theme revealed in health beliefs: {Health and physical fitness are gifts from deity and extra

territorial and supernatural causes have definitive influences on health status. With increasing age health condition deteriorates irrespective of observing or not observing hygienic guidelines}.

- Cultural theme revealed in therapeutic regimes and medication adherence: {Poor medication adherence, discontinuation and changing medication schedules arbitrarily, omission of some items from their medications based on personal beliefs and experiences or suggestions from other lay persons, tendency to discontinue consumption of some drugs without renewal of recipes/prescriptions}
- Cultural theme revealed in physical and mental health habits: {Lack of appropriate knowledge, attitude and practice about physical and mental health promoting routines}.
- Cultural theme revealed in family and social relationships: {Perceived strain and tension in familial relationships, ineffective familial relationships and intentional seclusion}.
- Cultural theme revealed in social and recreational activities: {Monotony and unproductivity in leisure times, lost opportunities, no idea and sometimes negative viewpoints about leisure activities}.
- Cultural theme revealed in habits and beliefs about sleep and rest time: {Lack of knowledge about value and importance of a refreshing and comfortable sleep and rest specifically in old age, lack of knowledge and practice regarding relaxation techniques and facilitating factors on sleep, perceiving many sleep disorders as normal and inevitable in aging }.
- Cultural theme revealed in habits and beliefs about food and nutrition: {Sensitivity and interest about foods and nourishments; believing that good nutrition is the best way for health maintenance and improvement; selection of foods mainly based on palatability and personal preferences instead of consultation with physicians and nutritionists}.
- Cultural theme revealed in beliefs and behaviors about physical activities: {A dominant misconception that physical exercise and sports are luxurious and not important for elders (although some elders verbalized that exercise is beneficial and very important for elders but nearly all of them didn't regularly engage in exercises)}.
- Cultural theme revealed in welfare and economic status: {A wide discrepancy between elders financial and welfare status}.

## CONCLUSION AND DISCUSSION

The main concern of the researcher in this study was to develop a prototypical community based care system for Tehranian elderly citizens that would fulfill part of unrecognized and unresponded community dwelling elders' health care needs. To ensure that the main characteristics



of care delivery systems would be accomplished in this proposed model (e.g. comprehensiveness, accessibility, quality services, emphasis on preventive and health promotive measures) and fine-tuning the interventions to unique socio-cultural backgrounds of the elders and their families; methodological triangulation including:

- Comprehensive relevant literature review;
- Attainment of experts' opinions through nominal group technique and
- Conduction of micro ethnography study as an extensive and objective needs assessment approach, has been employed. The preliminary results of employing this care system and examination of expected outcomes such as enhancing quality of life and hope in elders reflects the efficiency of this system, although further complementary studies and particularly cost benefit analyses are strongly recommended.

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**Table 1. Main concepts and elements revealed in each methodology**

Literature Review	NGT	Ethnography
Systems Theory Micro – Mini and Macro Systems Holistic Approach Comprehensive Assessment Neuman's health care systems model Anderson & McFarlane's Community as Partner Model Interdisciplinary Collaboration Model Medical Acute Care Model Transcultural Nursing Case Management (Care Management) Standards of Gerontology Nursing Practice National Council of Aging Frail Older Adult Aging in Place Multi purpose Centers Municipality Anticipatory Care giving Preventive Care giving Supervisory Care giving Instrumental Care giving District Nurse Visiting Nurse Goal Keeper Quality of Care Quality of Life	Frail elders Nurse (public health) Physicians (general practitioners) Social worker Nutritionist Psychologist Volunteers Elders and families Health Assessment (Health) Education (Health) Consultation (Health) Research Referrals Case management follow-up and discharge planning Integration Welfare Organization Community Center Day Clinic Seniors' Club Seniors Health Center Ministry of Health Interdisciplinary Collaboration Quality of Care (Satisfaction, Hope, Wellbeing) Enabling and Empowering Networking	Health Believes Health as Gift Inevitable deterioration in health condition Poor therapeutic regimes & Medication adherence Lack of appropriate knowledge, attitude and practice about health promotion Perceived strain and tension in familial relationships, ineffective family relationships and intentional seclusion Monotony and unproductivity in leisure times Perceiving many sleep disorders as normal Good nourishment is good health Self prescribed regimens Sport is a luxury No regular engagement in physical activities Financial- welfare status mismatching



Fig 1. A hypothetical representation of interconnections between building blocks in community-based social-health care system model

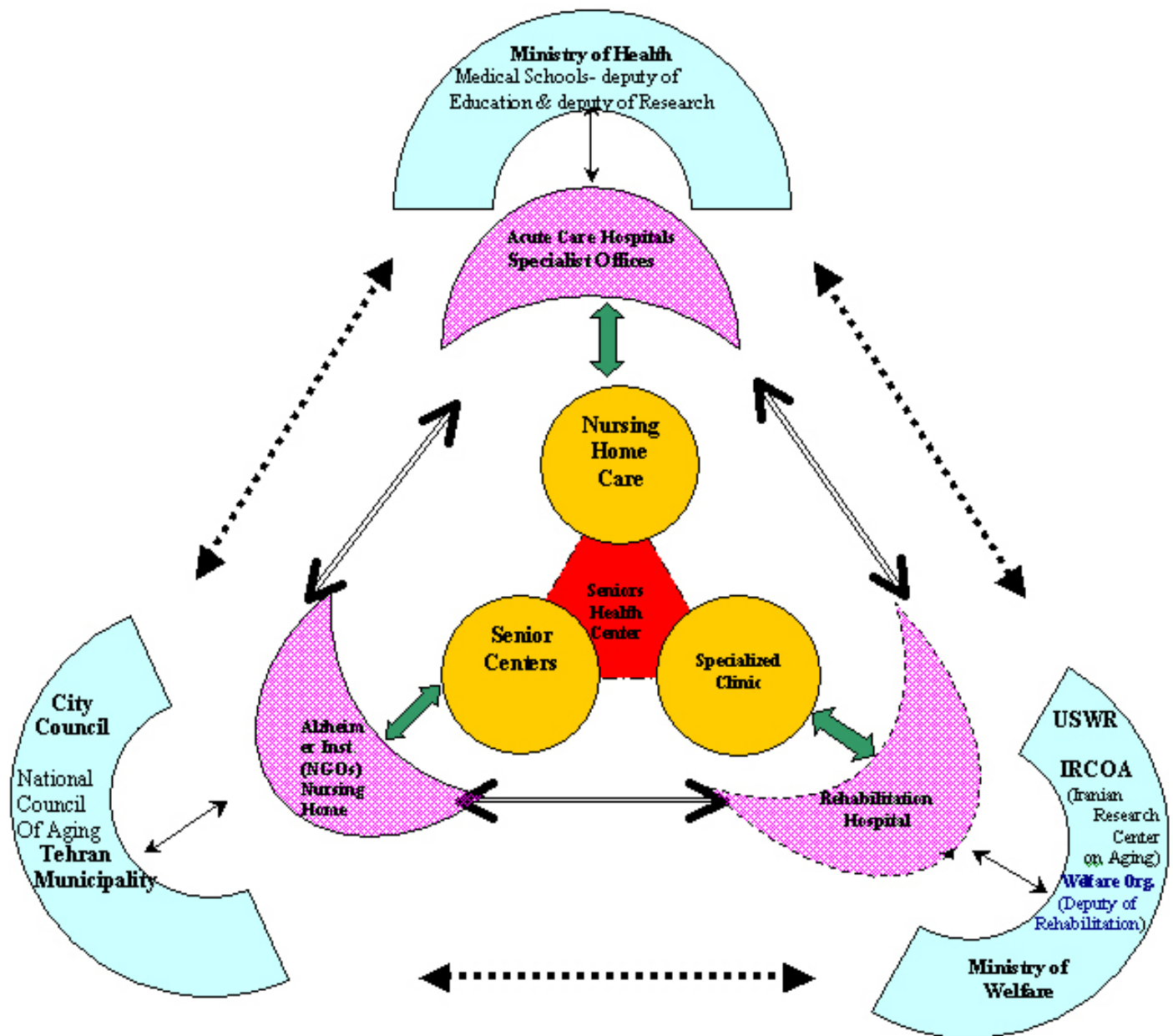
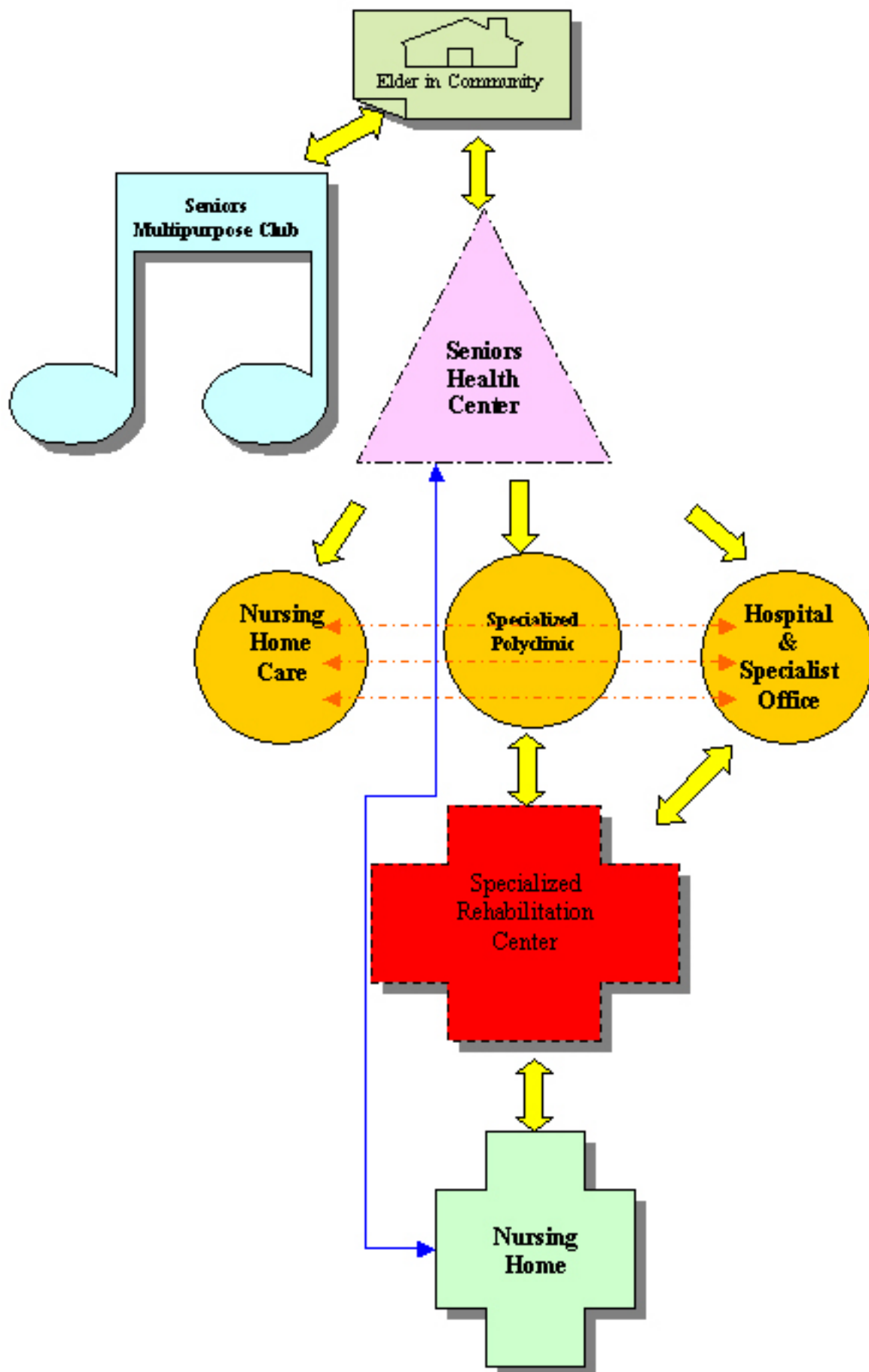


Fig 2. The proposed algorithm for community-based social-health care system model



# Past, Present and Future of Family Medicine in Bangladesh

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Bangladesh is a small country in South Asia with an area of 1,44,000 sq. km. and a population of over 140 million. It is the 8th most populous country of the world, but in terms of land area Bangladesh ranks 93rd [1]. The population density is 1060 per sq. km [2].

Right to healthcare was recognized as one of the fundamental rights for every Bangladeshi citizen in the very first constitution of the newly liberated People's Republic of Bangladesh in 1972 [3]. Directorate General of Health Services and later Directorate of Family Planning was established by the Government as independent Departments under the Ministry of Health and Family Welfare, to provide backbone for delivering primary health care in Bangladesh.

The Directorate of Family Planning is concerned with birth control, maternal and child health while the Directorate General of Health Services is responsible for overall health care of the country. Under these two Departments 341 health complexes and 2329 health centres have been established in the country at the sub-district and union levels respectively, which are the two smallest administrative units in Bangladesh [4]. The Union Health centres are staffed by 1-2 graduate physicians and a number of paramedics and traditional birth attendants (TBA), while 9 graduate physicians and several nurses, paramedics, TBAs, laboratory technicians and other support staff are posted in the sub-district health complexes. However in most cases, the more remote and peripheral sub-district health complexes and union health centres are under-staffed.

The physician: patient ratio in Bangladesh is 1:4775 [2]. Most physicians are based in urban areas meaning that the scenario is even poorer in the rural communities, where primary health care is provided by quacks, rural medical practitioners, traditional medicine practitioners and paramedics. Only 30% of the population of Bangladesh has access to primary health care [2].

In the urban areas, in big cities, district towns and municipalities, people mainly depend on medical graduates, fresh or experienced, and specialists for their every day health needs. Specialists play an important role in providing primary health care in Bangladesh. No referral is needed to consult a specialist physician here.

Patients usually consult the respective specialists based on their initial idea about their disease. So whereas a patient with complaints of headache resulting from a brain tumor may correctly go to a Neurosurgeon directly at the very beginning, more commonly they end up in the wrong consultation chambers. For example patients with irritable bowel syndrome often consult Hepatologists for fear of cirrhosis of liver.

Bangladeshi patients can access primary health care through different gateways, which adds a huge problem. Not only the patients suffer because of the huge difference in the quality and standard of health care they receive, they are also vulnerable to mal-treatment in the hands of non-qualified practitioners (e.g. quacks, rural medical practitioners, traditional medical practitioners etc.) Besides, over the years, the situation has become so difficult and complex that it will take years to put primary health care on the right track in Bangladesh. We are trailing far behind what the Brazilians have achieved by establishing 'health teams' comprising GP, nurse, nurse assistants and community agents with the support of World Bank [5], [6].

Primary health care in Bangladesh is financed by both the public and the private sectors. But the majority of the 140 million Bangladeshis use the public system. In 2005, Bangladesh utilized a significant portion of her gross national product in health care and a bulk of this money went to primary health care.

## Role of Family Physicians in delivery of primary care in Bangladesh

The College of General Practitioners of Bangladesh has been conducting a Fellowship programme for general practitioners for several years with limited success. As the specialty and the Fellowship offered by this college were not recognized by the Bangladesh Medical and Dental Council and the Bangladesh Government, it attracted little enthusiasm among medical graduates. Family medicine has been recognized as an independent specialty in Bangladesh for less than a year, although neither the only medical university in Bangladesh, nor the medical faculties of the different public and private universities are offering any course in Family Medicine as yet. The Bangladesh College of Physicians and Surgeons

has recognized this specialty and devised the training programme for residents specializing in this branch. The development though very late, received momentum as the Royal College of General Practitioners of UK selected Dhaka, the capital city of Bangladesh, as the Regional Centre for holding clinical MRCGP examination. With all the international, regional and local attention it is therefore expected that the subject will flourish in Bangladesh in its own right far sooner than expected. The crude reality however is that the country will probably have to wait for a few more years to have her first set of qualified Family Physicians who can then contribute in a more useful way to the advancement of this specialty for the better interest of not only the subject, but also the people and the country as a whole.

The recently introduced training programme for Family Medicine residents in Bangladesh is somewhat similar to the GP training programme in the UK. However, as of now, the fact remains that the relationship between primary care physicians and the specialists is precarious without any type of coordination by the health system.

### Challenges for Family Medicine in Bangladesh

Family medicine in Bangladesh is faces a number of challenges, namely:

1. Lack of health professionals with clinical competence to act in primary health care.
2. Homogenization of the general practice in entire Bangladesh with different realities co-existing.
3. Ignorance by specialists who are, in general, rather dismissive towards Family Medicine.
4. Lack of interest on part of specialists not wanting to lose their 'specialist family practice'.
5. Lack of interest among fresh medical graduates in Family Medicine.

### How Family Medicine can flourish in Bangladesh

Although a lot depends on the support of the policy makers and the Government, specialists involved in 'specialist general practice' and graduate physicians engaged in general practice can contribute effectively in this regard by means of quality practice and research to prove the effectiveness of Family Medicine and primary health care. The integration of teaching and practice in Family Medicine is important [7]. There is lack of interest as well as qualified researchers interested to work in this field in Bangladesh. It is also important to ensure delivery of quality primary health care and to break the vicious cycle of bad clinical practice by untrained and ill-trained health professionals. Ensuring adequate employment and income for the qualified Family Physicians in the public and private sectors will also help ensure quality of clinical practice at primary health care. The initiatives, however in this regard in Bangladesh, are so far sparse.

### Bangladesh Primary Care Research Network

The Bangladesh Primary Care Research Network (BPCRN) has been established, with active cooperation from the International Federation of Primary Care Research Networks (IFPCRN) and the Pakistan Primary Care Research Network (PPCRN), where Family Medicine is most developed in South Asia. The unique characteristic of BPCRN is that this newly established organization is headed by and comprises mostly of specialists with a passionate approach to Family Medicine while it also includes graduate general practitioners. BPCRN looks forward to collaboration with other regional and international primary care research networks and primary health care societies. It is expected that such collaboration will prove beneficial for the cause of Family Medicine and ultimately primary health care not only in Bangladesh, but in the entire South Asian region, the home of a bulk of the world's population, where structured Family Medicine is unfortunately virtually non-existent.

### Goals of Bangladesh Primary Care Research Network

1. Vision Statement: To promote skills in research methodology among Family Physicians.
2. To promote and support primary health care research in Bangladesh.
3. To identify issues in Family Medicine and to address them through research based on sound scientific principles.
4. To conduct affairs of the network through the following office bearers to be elected for a period of three years by the members of the group: Chairman (1 no.), Vice-Chairman (1-3 nos.), Honorary Secretary (1 no.), Treasurer (1 no.), Scientific Secretary (1 no.), Member (1-5 nos.)
5. The network will have an Advisory Committee comprising of eminent local, regional and international Family Medicine Specialists and physicians.
6. To ensure regular interaction between network members through meetings and e-mails.
7. To conduct research to influence Government policy in favor of Family Medicine and primary health care.
8. To support and promote collaboration between academic physicians interested in Family Medicine working at institutions and universities with those working in the community.
9. To help improve quality of care provided to patients in the community by general practitioners through research.
10. To present works of the network at national and international forums and journals.
11. To establish collaboration with regional and international Family Medicine Associations and Primary Care Research Networks.

## CONCLUSION

The aim of establishing structured primary health care in Bangladesh with Family Medicine as an independent specialty can be achieved with priority government support and sincere cooperation from the medical fraternity. BPCRN aims to contribute in achieving this goal in whatever way possible.

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# The Effects of Breast Cancer Early Detection Training Program on the Knowledge, Attitudes, and Practice of Female PHHC Physicians (Eastern Province; 2004)

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**Key Words:** KAP on Breast Cancer Screening and Management, PHHC

## ABSTRACT

**Introduction:** It has been shown by many studies that early detection and management of breast cancer had decreased mortality and morbidity from the disease. Several studies showed that physicians' ordering of screening depended on: levels of confidence and comfort, and knowledge of breast screening guidelines,<sup>11</sup> their colleague's mammography practices, the adequacy of insurance coverage, and how often they had spent an unreasonable time explaining mammography results,<sup>12</sup> and beliefs of physicians.<sup>1</sup> The present study studied the effects of breast cancer early detection training program on the knowledge, attitudes, and practice of female PHHC physicians.

**Methodology:** This is a non-randomized experimental design with 45 PHCCs' female physicians in Al Khobar, and Al Qatif cities (experimental group) during the period: Oct 2003- Feb 2004 participating. A workshop on knowledge of BC concepts and skills was developed and implemented on the participants. A 3-part structured questionnaire (demographic data, general knowledge, and early detection) based on fundamental knowledge of breast cancer and early detection was used as pre-post test instrument. The knowledge measurement is composed of 65 close-ended items with two choices (agree/disagree). A 30-item likert type of 5 choices questions were used to assess the attitudes of physicians. The Mamma Care program models were used to assess the ability of the physicians in detecting lumps and evaluating the nature of breast tissues. Another part of the assessment tool was the practice part totaling to 16 points, which assessed the lumps using two breast models with 5 lumps. The cut-off points of Knowledge and Practice are: Poor < 60% , Good 61-80 % , Excellent >80%. The cut-off points of attitudes were determined after taking the mean of all the respondents.

**Results:** 65% of the respondents were Saudis, 95% hold bachelor's degree and 5% held master's degree. The mean age was 35.91 years. The mean duration of PHHC practice was 6.065 years, and mean duration of practice is 8.35 years. The findings of the study show that the program improved the PHC physicians' KAP significantly. Before intervention was given, the physicians had good knowledge about breast cancer and early detection (67%), but scored low regarding practice of BC (36%), and just 37% had a positive attitude. The pre and post-test mean scores of female physicians on the study group show a marked significant increase on the indicators of KAP after intervention; for knowledge from 67% to 96% ( $p < 0.001$ ), attitude from 68% to 78% ( $p < 0.001$ ), and for examination skills from 33% to 77% ( $p < 0.001$ ).

**Conclusion:** Before intervention was given, the physicians had good knowledge about breast cancer and early detection but scored low regarding practice of BC early detection and had a negative attitude of it too, and after the educational program, there were significant positive changes in physicians KAP.

## INTRODUCTION

Cancer of the breast is the most common cancer among women. The burden of breast cancer has increased steadily, almost doubling, in terms of estimated new cases annually over a 20 year span. Breast cancer was third in frequency in men and women taken as a group, and by far it is the most prevalent cancer in women with more than one million cases and nearly 600,000 deaths occurring worldwide annually [1]. The incidence rates are increasing in all countries with available statistics, and since women are at risk from the ages of late 30's, the impact of the disease is magnified.[2]

The highest mortality rate (ASR) in Arabic countries was in Lebanon (ASR = 23.4), and in Gulf countries was in Bahrain (ASR = 17.7). In Saudi Arabia, 677 deaths from breast cancer were reported and it has a mortality rate of 10, which makes breast cancer the second leading cause of all cancer- related death.

Studies of the etiology of breast cancer have failed to identify feasible primary prevention strategies suitable for use in the general population, so, reducing mortality from breast cancer through early detection has become a high priority.[2] Breast cancer is a progressive disease, and small tumors are more likely to be early stage disease, have a better prognosis, and are more successfully treated. [3] In a retrospective study to determine the effectiveness of screening mammography in a community medical setting, the result showed that among the patients who did not have previous screening mammography, 65.7% were diagnosed with "advanced" breast cancer (stages II, III, IV), while only 39.9% who had previous screening mammography were diagnosed with advanced breast cancer ( $p < 0.001$ ).[4]

The value of CBE as a screening tool for breast cancer cannot be specifically determined due to lack of randomized trials demonstrating CBE's independent contributions to reduced mortality.[5] Several studies have evaluated the proportion of cancers identified by CBE that were not detected by mammography. The highest levels were in older studies and/or where mammography sensitivity was lower than that attained by current technology.[6-10]

Several studies showed that physicians' ordering of screening depended on: levels of confidence and comfort, and knowledge of breast screening guidelines,[11] their colleague's mammography practices, the adequacy of insurance coverage, and how often they had spent an unreasonable time explaining mammography results, [12] beliefs of physicians and patient preference for a female provider,[13] and physicians being younger, female, and internists.[1]

Some studies on BC screening knowledge among medical

practitioners showed: medical students reported needing additional training in clinical breast examination and recommended more curricular time devoted to education about breast cancer screening is needed,[14] although they agreed with published guidelines for screening mammography use, practitioners tended to have relatively low levels of knowledge about breast cancer risk factors, and the effectiveness of other breast cancer screening methods, and tended to over-estimate their breast cancer screening knowledge and skills.[15]

In another study, no significant difference was found between the physicians who received and those who did not receive coaching and supportive interventions over the course of the academic year. A difference was noted on compliance with BSE by those who received training evidencing more compliance.[16]

The present research assessed the effects of breast cancer early detection training program on the knowledge, attitudes, and practice of female PHHC physicians.

## METHODOLOGY

This is a non-randomized quasi experimental design, with 45 PHCCs' female physicians in Al Khobar, and Al Qatif cities (experimental group) and 41 PHHCs' female physicians in Al Dammam City (control group) during the period: Oct 2003- Feb 2004 participating. The workshop consisted of 5 lecture sessions using power point presentations about epidemiology and burden of breast cancer, risk factors of breast cancer, evidence-based screening programs and screening guidelines, breast cancer management, and follow up of survivors of breast cancer, resource speaker-sharing of her case and group discussion afterwards, group discussion and problem solving sessions on how to deal with breast lumps in PHHC and the physicians' future view of breast clinic in the PHHCs, practical sessions designed to improve the participants' examination skills, distribution of instructional materials in the form of a manual on breast cancer detection program which included the workshop's time table, rationale, aim objectives, topics, methods, approaches, updated content materials and health education materials, and evaluation.

The dependent variables of the study were the PHHC's physicians' knowledge, attitudes, and practice (KAP) on breast cancer screening and the independent variables were PHHC's physicians' demographic characteristics and workshop attended. Each participant in the control group carried out the examination of the models then completed the questionnaire under supervision of the investigator. The experimental group attended the workshop which consisted of: distribution of instructional materials, five lecture sessions of 10 to 30-minutes, a case study and group discussions of a patient who was invited, and group

discussion and problem solving sessions. A 55-minute videotape was used as a guide to the clinician through step-by-step exercises. During the lecture sessions and problem solving sessions, the Mamma Care model of clinical learning system was used.

A 3-part structured questionnaire (demographic data, general knowledge, and early detection) based on fundamental knowledge of breast cancer and early detection was used as a data gathering tool. The knowledge measurement is composed of 65 close-ended items with two choices (agree/disagree). A 30-item likert type of 5 choices questions were used to assess the attitudes of physicians. The Mamma Care program models were used to assess the ability of the physicians in detecting lumps and evaluating the nature of breast tissues.

Another part of the assessment tool was the practice part totaling 16 points which assessed the lumps using two breast models with 5 lumps. The cut-off points of Knowledge and Practice are: Poor < 60%, Good 61-80%, Excellent >80%. The cut-off points of attitudes were determined after taking the mean of all the respondents.

A pilot study was conducted using the tools of data collection to assess the reliability of the research tool, which was found to be highly reliable (Cronbach  $\alpha$  coefficient of 0.80). Face validity and content validity were also established with the aid of experts on the field in Saudi Arabia. The Statistical Package for Social Science (SPSS) version 10 was used for data entry and analysis and decided to use a  $p$  value of <0.05 level of significance (with 95% confidence interval). The study followed strict ethical considerations.

## RESULTS AND DISCUSSION

The sample group of the study, shown in Table 1, was composed of 75 or 96% of the 78 PHC female physicians who were available at the time of the study. The findings, that 65% of the physicians were Saudi having mean and median ages of  $35.93 \pm 7.23$  and 36 age of years, respectively, indicate that a good number of younger Saudi female physicians are working in the 3 cities of Al Dammam, Al Khobar and Al Qatif. The respondents' mean ages, duration of medical practices in general and PHCCs in particular, are lower than what is in literature.<sup>9,10,11,12</sup> Most of the physicians in the study (95%) did not undergo post graduate training as compared to literature wherein 46% are family physicians. The 5 physicians (5%) in the study who had master's degree in pediatrics (3), obstetrics (1), and gynecology (1) were also working as general physicians.

The average scores of the female physicians on the indicators of knowledge before intervention shown in Figure 1 were as follows: epidemiology of BC was 78%,

BC in Saudi Arabia was 60%, presentation was 47%, BC management was 83%, recommendation follow-up in BC survivors was 74%, BC risk factors was 69%, and BC screening guidelines was 73%. The total score on knowledge in Figure 2 was 64%, total score on attitudes was 68%, total score on examination of BC was 40%, and overall total score was 36%.

In general, there were significant statistical differences after the educational program shown in Table 1 in the knowledge, attitude, and practice of physicians regarding BC detection and management. There were significant statistical changes after the education program in the physicians' knowledge regarding BC epidemiology shown in Table 2 in seven items: the burden of breast cancer increase in western countries ( $p=0.016$ ), increases in BC incidence rate are seen in an area that previously had low rates ( $p<0.001$ ), low success of BC treatments ( $p=0.016$ ), the female BC age (ASR) in Saudi Arabia was 14.1 per 100000 ( $p<0.001$ ) BC rate was the highest rate of all types of cancer ( $p<0.001$ ), The highest BC ASR in Riyadh and Eastern Region ( $p<0.001$ ), and the nature of BC in Saudi Arabia is not the same as in the western countries ( $p<0.001$ ).

There were significant statistical changes in other knowledge parameters, shown in Table 3: in BC presentation, BC management, BC recommendation for primary care follow up in breast cancer survivors, BC risk factors, BC screening tests, and BC screening guidelines.

In BC presentation, only in the parameter obvious skin changes in the breast as late BC presentation, no change had occurred since the doctors got correct responses before the workshop. In other BC presentation parameters, the improvements in correct responses are significant at  $p<0.001$ .

In BC management, the doctors showed improvement in correct responses in new adjuvant chemotherapy is the standard of Rx for localized and advanced BC at  $p<0.01$ , while in the other parameter not much improvement occurred because almost all doctors gave the right answer at the start and after the study they all gave the correct answers. In recommendation for primary care follow up for breast cancer survivors, great improvement at  $p<0.001$  were achieved in correct responses in routine laboratory testing CBC, LFT, blood chemistry annually. The doctors got high correct scores before the workshop in the other parameters of recommendation for primary care follow up for breast cancer survivor.

In Knowledge of BC high risk factors, significant gains in correct answers were found in the following factors: age ( $p=.003$ ), paternal and maternal relatives ( $p=.039$ ), FH of ovarian cancer ( $p=.039$ ), FH of BC at age <45



( $p = .006$ ), race ( $p < .001$ ), late menarche ( $p = .013$ ), nulliparous ( $p = .016$ ), parous having few children with a late age at 1st and subsequent birth ( $p < .001$ ), early age at menopause ( $p = .021$ ), prior breast pathology ( $p < .001$ ), rapid growth and great adult height ( $p < .001$ ), total fat and saturated animal fat intake ( $p = .008$ ), meat intake ( $p < .001$ ), alcohol ( $p = .004$ ), endogenous free estrogen ( $p < .001$ ), oral contraception ( $p = .004$ ), postmenopausal estrogen-progesterone therapy ( $p < .001$ ), frequent chest x-ray or fluoroscopy ( $p < .008$ ), electromagnetic fields ( $p < .001$ ), and stress ( $p < .001$ ).

There were significant statistical changes after the education program in the doctor's BC screening tests except on the following items: mammography sensitivity is 77-95% and specificity of 94-97% and ultrasonography is not to be used for routine screening. Significant changes were achieved after the program in the following items of BC screening guidelines: BCE by professional advice to all women  $\geq 20$  years ( $p < .001$ ), mammography is the only screening method that proves to decrease BC mortality and morbidity ( $p < .001$ ), because mammography and BCE is variable sensitive, BSE has been advised also to women  $> 20$  yrs old ( $p = .013$ ). The correct responses of doctors before the program in other items were already high.

There were significant statistical changes after the education program in the physician's attitude toward breast cancer (Table 4). The total attitude score improved significantly and improved significantly on items: Women will attend BC screening program if the PHC doctor will advice them to go ( $p = .013$ ), treatment modality of BC depends on the histological types and stage of the disease not the patient choice ( $p < .001$ ), and the patient should be referred to psychiatry after diagnosis of BC ( $p = .007$ ).

The physicians' practice responses totally improved ( $p < .001$ ), as shown in Table 5: Each item improved significantly too as follows: Comparing the nature of the two breasts ( $p = .014$ ), total score of nodular lump examination ( $p < .001$ ), and total score of soft examination ( $p < .001$ ). They also significantly improved in identifying all kind of both soft and nodular lumps as shown in Table 6. Like other studies in literature 17,18,19,20 the findings of the study show that intervention programs to improve the KAP of physicians increase their KAP significantly and therefore significant increase in their utilizing of BC early detection screening is to be expected.

## CONCLUSIONS

From the results of the study, the following are stated: (1) Before intervention was given, the physicians had good knowledge about breast cancer and early detection but scored low regarding practice of BC early detection and had a negative attitude of it too, and (2) After the

educational program, there were significant positive changes in physicians KAP.

## RECOMMENDATIONS

The conclusions showed that programs for the improvement of BC KAP should be part of the medical curriculum and for those who had not taken some programs in their undergraduate medical training, BC KAP intervention programs should be part of PHC physicians' CME. A replication of this study to be conducted to all PHC physicians would an interesting thing to do.

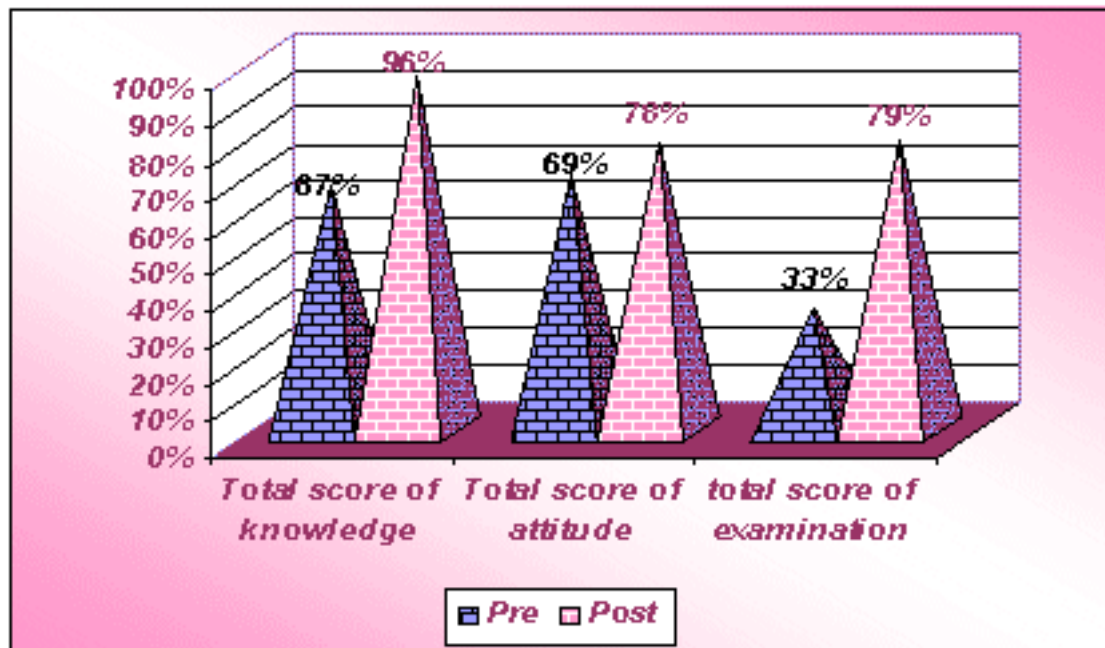
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**Table 1. Distribution of Female PHHC Physicians in Al Khobar, Al Qatif and Al Dammam Cities According to Selected Demographic Variables**

Demographic Variables	Study Groups No. %		Control Groups No. %		p-value
Nationality					
1. Saudi	26	70	23	60	0.37
2. Non-Saudi	11	30	15	40	
Qualification					
Bachelor	35	95	35	95	9.51
Master	2	5	2	5	
Demographic Variables	Mean $\pm$ sd		Mean $\pm$ sd		p-value
Age by year	35.2 $\pm$ 7.6		36.6 $\pm$ 6.9		0.4
Duration of practice in (yrs)	6.9 $\pm$ 5.4		10.7 $\pm$ 6.8		0.2
Duration of practice in PHHC (yrs)	8.5 $\pm$ 6.6		8.2 $\pm$ 5.9		0.3
Total					

**Figure 1. Changes in the Female PHHC Physician's KAP on BC (Al Khobar, Qatif, and Dammam; 2004)**





**Table 2. Female PHHC Physician's Breast Cancer Knowledge (Al Khobar, Qatif, and Dammam; 2004)**

Variable	Pre-test		Post-test		p-value
	Right N (%)	Wrong N (%)	Right N (%)	Wrong N (%)	
<b>Epidemiology</b>					
<b>BC World Epidemiology</b>					
The burden of BC increases in western countries only	30 (81)	7 (19)	37 (100)	0 (0)	0.016*
Increases in BC incidence rate are seen in area previously had low rates	11 (30)	26 (70)	35 (95)	2 (5)	<0.001
The success of BC treatments are low	28 (76)	9 (24)	35 (95)	2 (5)	0.016
<b>BC Epidemiology in Saudi Arabia</b>					
The female BC age (ASR) at SA was 14.1 per 100,000	15 (40)	22 (60)	35 (95)	2(5)	<0.001
BC rate the highest rate of all types of cancer	12 (32)	25 (68)	35 (95)	2(5)	<0.001
The highest BC ASR in Riyadh & Eastern Region	20 (54)	17 (46)	37 (100)	0 (0)	<0.001
The nature of BC in SA is not same as in Western countries	16 (43)	21 (57)	32 (86)	5 (13)	<0.001
<b>BC Presentation</b>					
Only 30% of breast masses are malignant.	5 (13)	32 (87)	31 (84)	6 (16)	<0.001
Nipple discharge is not a common presentation	21 (5)	16 (43)	35 (95)	2 (5)	<0.001
A painful breast mass is not malignancy	14 (3)	23 (62)	32 (87)	5 (13)	<0.001
Mass in pregnancy should be evaluated after delivery.	10 (2)	27 (73)	31 (84)	6 (16)	<0.001
An area of thickening may be present cancer	24 (6)	13 (35)	36 (97)	1 (3)	<0.001
Unilateral persistence nipple eczema could be an early singe of BC	17 (4)	20 (54)	37 (100)	0 (0)	<0.001
<b>BC Management</b>					
New adjuvant chemotherapy is the standard pf Rx for localized and advanced BC	23 (62)	14 (38)	7 (100)	0 (0)	<0.001
<b>Recommendation for Primary Care Follow up in Breast Cancer Survivors</b>					
Routine laboratory testing CBC, LFT, blood chemistry annually	4 (11)	33 (89)	33 (89)	4 (11)	<0.001
<b>BC Risk Factors</b>					
Age	23 (62)	14 (38)	34 (92)	3 (8)	0.003
Paternal & Maternal relatives	27 (73)	10 (27)	34 (92)	3 (8)	0.039
FH of ovarian cancer	28 (76)	9 (24)	35 (95)	2 (5)	0.039
FH of BC at age <45	25 (68)	12 (32)	27 (71)	11 (29)	0.006
Race	18 (49)	19 (51)	21 (55)	17 (45)	<0.001
Late menarche	21 (57)	16 (43)	32 (86)	5 (14)	0.013
Nuliparous	30 (81)	7(19)	37(100)	0 (0)	<0.001
Parous having few children with a late age at 1st & subsequent births	22 (59)	15(40)	37(100)	0 (0)	<0.001
Early age at menopause	22 (59)	15(40)	32(86)	5(14)	0.021
Prior breast pathology	4 (11)	33(89)	35(95)	2(5)	<0.001
Rapid growth & great adult height	7 (19)	30(81)	35(95)	2(5)	<0.001
Total fat & saturated animal fat intake	29 (78)	8(22)	37(100)	0(0)	0.008
Meat intake	22 (59)	15(40)	37(100)	0(0)	<0.001
Alcohol	0 (0)	37(100)	9(24)	28(76)	0.004
Endogenous free estrogen	23 (62)	14(38)	37(100)	0 (0)	<0.001
Oral contraception	28 (76)	9 (24)	37(100)	0(0)	0.004
Postmenopausal estrogen-progesterone therapy	18 (49)	19(51)	36(97)	0(0)	<0.001
Frequent chest x-ray or fluoroscopy	29 (78)	8(22)37	37 (100)	0(0)	<0.008
Electromagnetic fields	12 (32)	25(68)	37(100)	0(0)	<0.001
Stress	19 (51)	18(49)	37(100)	0(0)	<0.001
<b>BC Screening Tests</b>					
CBE by professionals has sensitivity of 40-69% & specificity of 86-99%	28 (76)	9 (24)	37(100)	0(0)	0.04
Breast self examination doesn't increase survival rate	26 (70)	11(30)	37(100)	0(0)	<0.001
Genetic screening (BRCA1-BRCA2) use routinely now in all screening guidelines	8(22)	29(78)	34(92)	3(8)	<0.001
<b>BC Screening Guidelines</b>					
BCE by professional advice to all women <sup>3</sup> 20 years	18 (49)	19(51)	35(95)	2(5)	<0.001
Mammography is the only screening method that proves to decrease BC mortality and morbidity <sup>3</sup> 20 years	16 (43)	21(57)	34(92)	3(8)	<0.001
Because mammography and BCE is variable sensitive in BSE has been advice also to women <sup>3</sup> 20 years	24 (65)	13 (35)	34(92)	3(8)	0.013

**Table 3. Female PHHC Physician's Attitude Toward BC Early Detection and Management (Al Khobar, Qatif, and Dammam; 2004)**

Attitude Variable	Pre-test Attitude			Post-test Attitude			t (p-value)
	+ve N (%)	-ve N (%)	Mean $\pm$ sd	+ve N (%)	-ve N (%)	Mean $\pm$ sd	
Woman will attend BC screening program if the PHC doctor advises her to do it.	35 (95)	2 (5)	4.0 $\pm$ 0.6	36(97)	1(3)	4.2 $\pm$ 0.5	2.2 (0.03)
Treatment modality of BC depend on the histological types & the stage of the disease, not the patient preference.	2 (5)	35 (95)	1.8 $\pm$ 0.7	29(78)	8(22)	3.7 $\pm$ 1.1	8.8 (0.02)
Patient should be referred to psychiatry after diagnosis of BC	27 (73)	10 (27)	3.6 $\pm$ 1.0	33(89)	4(11)	4.0 $\pm$ 0.8	2.8 (0.007)
Total score	20.6 $\pm$ 2.1			23.3 $\pm$ 2.3			7.4 (0.42)

**Table 4. Female PHHC Physicians' BC Total Practice Score and Practice Mode (Al Khobar, Qatif, and Dammam; 2004)**

Practice Variable	Pre-test Mean $\pm$ sd	Post-test Mean $\pm$ sd	p-value
<b>A. BC Practice Score</b>			
Comparing the nature of the 2 breasts	1.2 $\pm$ 0.6	1.5 $\pm$ 0.6	2.6 (0.014)
Total score of nodular lump examination	1.5 $\pm$ 0.8	4.7 $\pm$ 1.4	14.6 (<0.001)
Total score of soft lump examination	2.0 $\pm$ 1.0	4.6 $\pm$ 1.5	9.3 (<0.001)
Total Marks of examination	4.6 $\pm$ 1.9	10.8 $\pm$ 2.4	<0.001

# Marine Animal Injuries to children in the South of Jordan

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## ABSTRACT

**Objective:** The aim of this study was to report the common marine animal injuries sustained by Jordanian children.

**Patients and Methods:** A prospective study of 152 patients, who sustained different marine animal injuries in the Gulf of Aqaba and treated at Princess Haya Hospital during the period from January 2004 to January 2006.

**Results:** One hundred and fifty two children who sustained marine animal injuries were managed with marked male predominance (9.9:1). Injuries were most frequent during July (32.9%) and during the night (75%). SeaUrchin was incriminated in 136(89.5%), while Lionfish and Stonefish were the cause of 14(9.2%) and 2(1.3%) respectively. All injuries were involving the limbs, with feet injured in 130(85.5%) and hands in 22(14.5%). Only 20(13.1%) patients required admissions to the hospital. Although no deaths were reported, variable severe systemic and local manifestations were caused by Stonefish, whereas SeaUrchin and Lionfish presented mainly with local reactions. All patients injured by Stonefish were managed in the intensive care unit and Stonefish antivenom was given.

**Conclusion:** Sea Urchin was the commonest cause of injuries while Stonefish was the cause of most serious injuries.

## INTRODUCTION

Serious injury from a marine animal attack is not very common. Nevertheless, there are over 1000 marine vertebrates and even more numerous invertebrates that are believed to be either venomous or poisonous [1]. Bites and stings from marine animals can be painful, become infected and required extensive medical treatment [2].

In Jordan, injuries caused by marine animals are restricted to the Gulf of Aqaba at the north end of the Red Sea. Swimmers are at risk of different marine animal injuries, some of them well known to the locals such as SeaUrchin, Lionfish and Stonefish [3].

Black SeaUrchin, fig 1, is an invertebrate marine animal [4]. It can bite and sting [5], it also has many black long sharp and brittle spines which break off after they have penetrated the skin producing mostly local reaction.

Lionfish, fig 2, is a vertebrate marine animal, it attacks with its dorsal spines producing local reaction and to a lesser extent mild systemic reactions.

Stonefish, fig 3, is a vertebrate marine animal, it looks like a stone or a piece of rock, it usually lies dormant in shallow waters, buried in mud, sand or rocks indistinguishable from surroundings. It is the most venomous fish, has thirteen dorsal spines that become erect when the fish is disturbed and are capable of piercing skin and sneakers. Each spine has 5-10 mg of venom (myotoxin) which acts on skeletal, involuntary and cardiac muscle, blocking conduction

in these tissues, this results in a muscular paralysis, respiratory depression, peripheral vasodilatation, shock, cardiac arrhythmias and arrest [1].

## PATIENTS AND METHODS

A prospective study was carried out for children 14 years and below who sustained different marine animal injuries in the Gulf of Aqaba and treated at Princess Haya Hospital in the period between January 2004 and January 2006. Patients were evaluated and information was obtained as to age and sex of children, type of injury, clinical manifestations, time of presentation to hospital, complications, and outcome.

## RESULTS

The total study population with marine animal injuries was 152 patients 138(90.8%) males and 14(9.2%) females with male to female ratio of (9.9:1). Their ages ranged from 5-14 years with a mean age of 9 years. SeaUrchin was encountered in most of the cases 136 (89.5%) while Lionfish and Stonefish were the cause of 14 (9.2%) and 2 (1.3%) respectively. The majority of injuries 136(89.5%) occurred during summer months Fig 4. 114 (75%) of injuries presented during the night time. All injuries were involving the limbs with feet injured in 130 (85.5%) and hands injured in 22 (14.5 %). Most of the involved subjects 110 (72%) were visitors rather than local residents. All cases of Stonefish and Lionfish injuries were admitted to the intensive care unit, whereas no admissions among SeaUrchin cases. No long term complications or deaths were reported in this study.

## DISCUSSION

Marine animal injuries in Jordan are restricted to the southern part of the country that is in the Gulf of Aqaba. It is a seasonal problem, usually in the summer months [6]. Penetrating wounds, stings and inoculation of venom are common marine animal injuries to unwary walkers during the summer season [7].

In our study, injuries were most frequent during the summer, when many families would visit the Gulf of Aqaba to spend their summer holidays, which is obvious from the fact that 72% of patients were visitors rather than locals. A significant percentage of injuries (75%) occurred during the evening and night time which could be explained by the local habits of dining and chatting at the seaside.

The most common clinical manifestation for all three species was localized pain, erythema and swelling (table 1). The pain caused by SeaUrchin and lionfish could be bearable, but the pain caused by stonefish is excruciating and could be severe enough in some cases to cause unconsciousness and thus drowning [1]. In our study the severity of pain caused by seaUrchin and lionfish was mild to moderate while the pain caused by stonefish was severe.

Most injuries involving the feet were caused by SeaUrchin and Stonefish, this usually occurs while children are playing in areas of shallow waters where Stonefish is usually buried in the sand or rocks indistinguishable from surroundings, SeaUrchin on the other hand is usually attached to rocks. Hands were involved mostly by Lionfish during trials by children to catch fish which has beautiful shapes and colours.

Fatalities caused by stonefish injuries usually occur within 5- 20 minutes of the sting [8]. In our study, no fatalities were reported although three patients presented about 20 minutes after the injury with signs of circulatory collapse, in a study involving adults conducted in the same hospital in 1996, one out of the three patients injured by stonefish died before reaching the hospital [3].

Regarding management, all patients received supportive and symptomatic treatment included antihistamines, steroids, and immersion of the involved limb in a bearable hot water. The use of hot water leads to destruction of the venom and minimizes the severity of pain [1]. In addition to the above measures, patients with stonefish injury were managed in the intensive care unit and stonefish antivenom was given. The dose of antivenom (Stonefish antivenom) ® administered was guided by the number of spinal stings as recommended by the manufacturers. The use of Stonefish antivenom has the benefit of neutralizing the venom and relieving the excruciating pain [8].

## CONCLUSION AND RECOMMENDATIONS

SeaUrchin was the commonest cause of marine animal injuries while stonefish was the cause of the most serious injuries. Early presentation and prompt antivenom administration may save the lives of stonefish injured patients.

In planning out the recommendations, three targets need to be addressed. First of all would be the local authorities who should make the coasts safe for public use, they should also work on increasing the public awareness by providing suitable warning signs or pamphlets. Next comes the health authorities where physicians must be educated in treating marine animal injuries. The last would be the public who should wear thick sole shoes when walking in areas of shallow waters, and they should keep a careful eye on the sea floor over which one is swimming and on the waters around.

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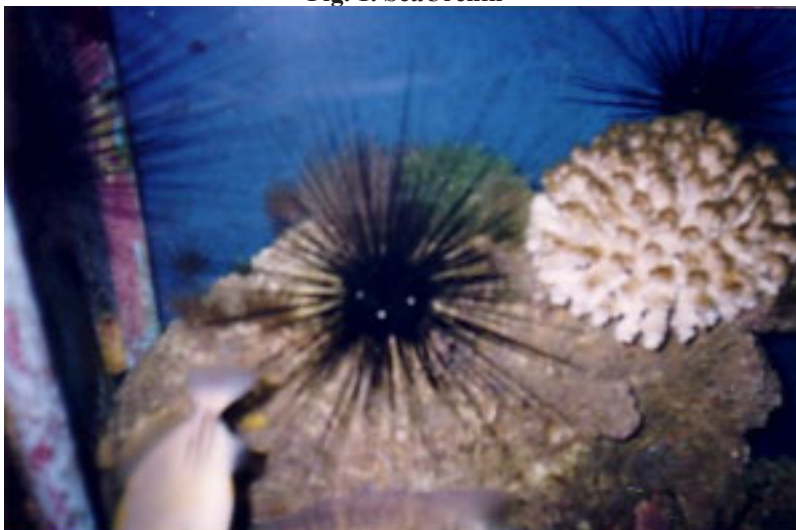
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**Table 1. Clinical manifestations according to cause of injury**

	<b>SeaUrchin 132 cases</b>	<b>Lionfish 14 cases</b>	<b>Stonefish 2 cases</b>
Localized pain	100% ( 136 )	100% ( 14 )	100%( 2 )
Erythema	95.5%( 126 )	85.7%( 12 )	100%( 2 )
Swelling	75.8%( 100 )	57.1%( 8 )	100%( 2 )
Nausea	15.1%( 20 )	28.6%( 4 )	50%( 1 )
Vomiting	6.0%( 8 )	14.3%( 2 )	50%( 1 )
Sweating	4.5%( 6 )	14.3%( 2 )	50% ( 1 )
Hypotension	0	0	100%(2)
Bradycardia	0	0	0
Tachycardia	10.6%( 14 )	28.6%( 4 )	100%( 2 )



**Fig. 1. SeaUrchin**



**Fig. 2. Lionfish**

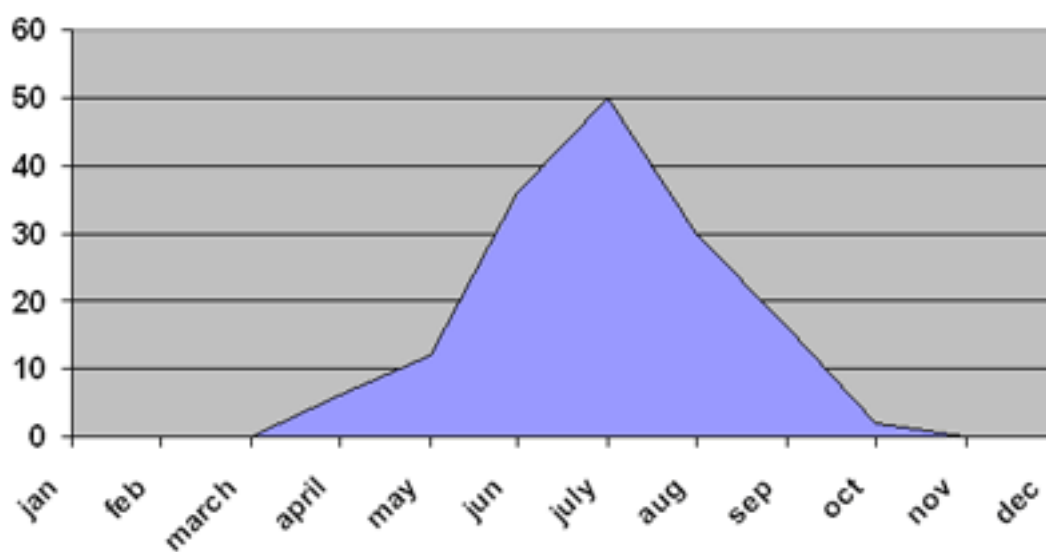


**Fig. 3. Stonefish**





Fig. 4. Monthly distribution of cases



# Infantile Dyskinesia and Vitamin B12 Deficiency

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**Keywords:** cobalamin, infant, deficiency, and abnormal movement.

## ABSTRACT

We report an 11-months old female infant, failure to thrive, developmentally delayed, who presented to Prince Ali hospital in the south of Jordan with chorea involving right side of the face, and right upper limb, found to have megaloblastic anemia due to vitamin B12 deficiency.

## INTRODUCTION

Cobalamin deficiency typically occurs in middle aged and elderly patients. It is considered to be rare in infants when it is usually secondary to maternal deficiency.

Most of the infants found to be cobalamin deficient were breast fed or born to vegetarian mothers. Under these conditions there is probably insufficient cobalamin

transfer across the placenta which leads to low cobalamin stores in the newborn. This deficiency is further deteriorated by insufficient cobalamin in breast milk of vegetarian mothers [1]. These infants can exhibit a prominent disorder of movement [3], severe neurological findings ranging from apathy, decreased visual contact, adynamia, and lethargy or even coma may accompany anemia [9].

## CASE REPORT

An 11 months old black female infant, exclusively breast fed, low socioeconomic status, failure to thrive, developmentally delayed, admitted to Prince Ali hospital with abnormal twitching movement of the right side of the face and right upper limb.

On examination she was pale her weight below 5th percentile, head circumference on 5th percentile, and normal height. She had global developmental delay, there was twitching movement involving the right side of the face and right upper limb, no other abnormal neurological signs, normal power, tone and reflexes. Other systems examination was normal.

Investigations showed low PCV 25%, high MCV 105 fl, neutropenia with hypersegmentation, and normal retics count. KFT normal, low albumin, other LFT

normal, B12 level low =65pg/ml, normal folate and ferritin level, ABG normal, sweat chloride test normal. Antiglidin Abs, antiendomesial Abs are negative. Brain MRI normal and maternal B12 is low 150pg/ml.

The patient was started on B12 IM 1mg daily for two weeks, Halidol drops were given for 3 weeks, but no response to treatment. Patient then was maintained on monthly 1mg B12 IM injection and was followed up in clinic. After three months of treatment, the patient showed complete resolution of the twitching movements, and laboratory disorders.

## DISCUSSION

Vitamin B12 is derived from cobalamin in food, mainly animal sources, secondary to production by microorganisms. The cobalamins are released in the acidity of the stomach and combine there with R proteins and intrinsic factor, traverse the duodenum, where pancreatic proteases break down the R proteins, and are absorbed in distal ileum [4].

Although there are abundant vitamin B-12-producing bacteria that colonize the large bowel, that organ is too distal to allow normal vitamin B-12 absorption [2].

The daily requirements for vitamin B12 in infants is 0.3-0.5 mcg, for children 0.7-1.4 mcg, for adult 2.0mcg, and for pregnant and lactating mother 2.6mcg [4].

There are two active forms of cobalamin in human body, deoxyadenosylcobalamin and methylcobalamin. Deoxyadenosylcobalamin is a required cofactor for conversion of methylmalonyl- CoA to succinyl- CoA and in its deficiency lead to incorporation of nonphysiologic fatty acids into cell membranes of CNS which may be responsible for neurological manifestations of cobalamin deficiency. While methylcobalamin is required for the

formation of H4folate, and conversion of homocysteine to methionine, H4folate is required for DNA synthesis [5,7]. While methionine is further metabolized to S-adenosylmethionine (SAM) which play a role in myelin and neurotransmitters synthesis and maintenance [6].

Another metabolite implicated in CNS manifestations is N-methyl-D-aspartate agonist action of homocysteine, which causes excitatory activity in basal ganglia by means of thalamocortical pathway [8]. Hyperglycinemia secondary to cobalamin deficiency is also implicated as a cause of abnormal movement [3,9].

Decrease in cognitive function in patients with vitamin B12 deficiency is related to hyperhomocysteinemia [1].

Symptoms and signs of cobalamin deficiency appears between ages of 2-12 months including vomiting, lethargy, failure to thrive, hypotonia, and arrest or regression of development [3]. Although these symptoms may appear even without anemia [1,7].

A syndrome of nutritional dystrophy and anemia, first described in 1957, was found exclusively among breastfed infants of Indian mothers of extremely low socioeconomic status. Although these infants had adequate general nutrition, they also had apathy, megaloblastic anemia, skin hyperpigmentation, involuntary movements, and developmental regression that were rapidly corrected by vitamin B-12 [2].

Approximately 50% of the infants with vitamin B12 deficiency exhibit abnormal movements manifested as tremor, twitches, chorea, or myoclonus. These movements can appear several days following the start of treatment [3]. Grattan-Smith et al reported the movement disorder that appeared after treatment, as that after a period of severe shortage, the sudden availability of cobalamin resulted in intense stimulation of cobalamin and folate pathways and produced a temporary imbalance of metabolic pathways [9].

The duration of these abnormal movements has ranged from 10-30 days [3], but in our patient twitches resolved after 3 months of treatment.

Generalized hyperpigmentation is a well-defined finding in patients with vit B12 deficiency [9], but it was not detected in our case (black infant). In evaluating vitamin B12 status, CBC which show MCV>94fl is considered suspicious for vitamin B12 deficiency, but neutrophil hypersegmentation is the only hematological change that correlates well with vitamin B12 deficiency [7]. In our patient MCV was 105fl and neutrophilic hypersegmentation was detected.

Measurement of serum vitamin B12 is considered the

cornerstone for assessing suspected cases of vitamin B12 deficiency, but it is altered by the concentration of the binding proteins, which causes false high or low values [7]. Serum B12 in our patient was low 65pg/ml. High levels of MMA and homocystein are more sensitive and specific for vitamin B12 deficiency [7], but unfortunately these tests are not available in our lab.

MRI findings in infantile vit B12 deficiency differ from those of adult forms. In adults subacute combined degeneration of spinal cord is detected, whereas in infants cerebral atrophy is seen [9]. In our patient brain MRI was normal.

Treatment of infants with vitamin B12 deficiency with CNS manifestations is by parental injection of vitamin B12 1mg daily for two weeks. Permanent treatment with monthly IM injection of 1mg vitamin B12 is required [4].

Treatment with vitamin B12 can reverse all the adverse effects but permanent sequelae may result [3]. The long-term consequences include poor intellectual performance and impaired cognitive function [1].

## CONCLUSION

Although cobalamin deficiency is rare in infancy, it should be considered as a cause of failure to thrive, developmental delay, and movement disorder. Prevention, early recognition, and treatment are required to avoid permanent long-term sequelae.

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# Informatics in Clinical Practice Monitoring and Strategic Planning

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## ABSTRACT

Though the implementation of a proper Electronic Medical Records system may be unaffordable for a small clinic most clinics use some form of computerised patient records. Detailed analysis of the data from these systems can provide information on key performance indices and are invaluable for strategic planning.

Computers have become an indispensable part of every clinic. Though it may not be economically viable to install an 'Electronic Medical Records'[1] or EMR system in a small clinic, computers are used in some form or other for patient data management.

An EMR is software that allows you to create, store, organize, edit and retrieve patient records on a computer. But it is more than just the electronic equivalent of paper. Advanced EMRs also allow you to automate many time-consuming, paper-driven office tasks. Some are even equipped with 'Computerized Physician Order Entry'[2] tool. EMR software has many advantages which are beyond the scope of this article.

Most of the clinics use custom made software to record patient data, but this does not include all the features of a typical EMR. This is generally used for storage of demographic and personal data, storage and retrieval of patient ID and appointment scheduling. Even these simple software packages require a database backend which in the majority of cases is MS Access though some use more advanced RDBMS (Relative Data Base Management Systems)[3] like Oracle or MS-SQL server.

The data stored in these database systems is usually used only for income auditing, billing and other similar tasks. However this data could provide a wealth of information which is important from the practice monitoring and marketing perspective, though this is often overlooked in small practises and clinics.

## PRACTICE MONITORING

Big hospitals use various kinds of data to monitor performance. However small clinics use only traditional financial statements. Going beyond figures like net revenues and costs and using meaningful financial reporting can offer a deeper and ultimately more effective analysis.

Medical practice is traditionally considered as a venerable profession outside the realm of a business environment. However the trend is slowly changing and more and more practitioners are considering their practice as a business and their patients as customers. This is especially true for certain specialties like cosmetology and dentistry and they have started realising that the principles of management applies to practice management as well. Hence it is important to think what else needs to be monitored apart from total income in a small medical establishment.

A few of the indices which may be important in practice management are mentioned below.

1. New Patient flow: This can be expressed as a percentage of previous month or a certain time period as it is important only when considered with respect to the previous month. It is not relevant for a new clinic. However for an old clinic it indicates the efficiency of the marketing management.
2. Old patient rate (OPR): This can be expressed as a percentage of total number of patients. OPR indicates the efficiency of the practitioner to retain the patients. However for a more sensitive measure of patient retention, the number of old patients returning after the standard follow-up period needs to be considered.
3. Average collection per new patient: This index may increase the income for a short period. However it is important to retain it within acceptable limits for each specialty as the longterm effects are not favourable.
4. Average collection per patient: This is a very sensitive measure of patient loyalty.
5. Revenue growth as a percentage of previous year.
6. Descriptive statistics of geographic location, socioeconomic status, demographic profile and referral from other practitioners and clinics: This is very important for strategic planning.



It is important to understand that most, if not all, the information needed to calculate the above indices is essentially data that the hospital already has available. It is a matter of taking the various datasets and merging them into useful information upon which decisions can be formed.

## DATABASE BASICS

Databases are fundamentally tools to allow people to organize and manipulate large amounts of data using the power of the computer to quickly translate and deliver that information in a humanly readable format.

Databases fundamentally organize the data into hierarchies. The building blocks for creating databases starting from the top level are the data structure or schema. Each data structure is made up of a series of records, and each record has a set of predefined fields.

Databases use a series of Tables to store the data. A table simply refers to a two dimensional representation of your data using columns and rows. Each column in the table is given a unique name which would be something like first\_name, last\_name, email.

To reduce the redundancy of information, some tables will have a primary key which can be used to link to other tables. It will become a foreign key for the linked table. For example if a patient comes for multiple visits we may have to enter the patient data each time if there is only one table. However if the patient data is stored in a separate table with a unique number, only that number needs to be entered to the 'visits' table so that data redundancy is minimised. This unique number is called as the primary key for the first table and foreign key for the 'visits' table.

## DATA PRIVACY[4]

If you give data from your patient management system to database professionals for analysis then you have to deal with certain crucial ethical issues like data privacy. The data often includes the personal details of the patient, diagnosis and investigation reports which have to be treated as confidential. Hence it is imperative for healthcare practitioners to learn basic data warehousing techniques to remove sensitive data before outsourcing it to professionals for more detailed analysis.

## DATA PRIVACY[5]

Data warehousing is the process of consolidating data to a central store so as to make analysis of data easier. The practitioner who owns the data has to remove the personal information in the database before giving it for analysis. Usually all the personal information will be grouped

together in a single table. Though in some cases this database table can be safely dropped or removed. This may make the database unstable because the primary key is often stored in this table. This table can also contain some useful information like age, sex, region, occupation and socio-economic status. Hence it is better to remove individual fields like first\_name, last\_name, phone number, address, email etc.

Data warehouse also implies that the data is manipulated and consolidated in a separate location, different from operational data used for day-to-day activities. For a small clinic, it essentially means that you have to take a copy of the database and work on that so that original database is not damaged. Though I have used the term 'Data warehousing' here, it is a much broader concept than just backup and deleting unnecessary fields.

## MS ACCESS BASICS

Microsoft® Access is a powerful program to create and manage your databases. It has many built in features to assist you in constructing and viewing your information. A detailed description of MS Access is beyond the scope of this article. Deleting a field is usually done in the table design view as depicted in Fig 1. It involves the following steps.

1. Click on the Tables tab on the Access main screen
2. Highlight the name of the table to be modified and click on the Design button.
3. Make the necessary changes.
4. Save the table by pulling down the File menu and choosing Save.
5. Close the table by pulling down the File menu and choosing Close.

## DATA ANALYSIS

A database query is usually expressed in SQL or structured query language. The indices I mentioned earlier can be easily calculated from the database by using simple SQL. In MS Access you can easily create a query in Design View as depicted in Fig 2 to filter the information in your table. You establish a set of criteria when you create a query.

However there is other information which can be derived from the database apart from the calculation of above indices and descriptive statistics of demographic data like age, sex and location.

## DATA MINING[6]

Data mining has been defined as "The nontrivial extraction of implicit, previously unknown, and potentially useful information from data" and "The science of extract-

ing useful information from large data sets or databases". Although it is usually used in relation to analysis of data, data mining, like artificial intelligence, is an umbrella term and is used with varied meaning in a wide range of contexts. It is usually associated with a business or other organization's need to identify trends. Data mining techniques can be used for patient data also. It will help us find patterns which may not be evident at the first look like the referral pattern between specialists in a clinic. Data mining converts data into knowledge.

## PLANNING THE RIGHT STRATEGY

As with any complex business, clinics can create all kinds of statistics. But if not used wisely, the only thing all these data will add up to is a bunch of numbers. Organizations that get the best results from this data are those that get all levels of leadership involved in analyzing the information.

Strategy formulation frequently includes a SWOT analysis, or an assessment of internal strengths and weaknesses (SW) combined with environmental opportunities and threats (OT).

However, SWOT analysis may sometimes fail to reflect the true picture. Senior managers act only on perceived strengths, weaknesses, opportunities, and threats as filtered through their own lenses and those of middle managers, physicians, nurses, and others in the organization. These filtered perspectives prevent senior management from seeing the real SWOT, thereby creating a potential for suboptimal strategic decisions. Patient data will help in having a more realistic SWOT analysis.

Using the patient data we can monitor the volumes and the practice indices for all departments to help management understand where the hospital is growing or declining during the year. The analysis will also help in understanding the impact of various factors like changes in payer contracts, coding and reimbursement regulations. It can even unearth a few not so obvious factors like practice patterns of physicians. This includes the pattern of sending investigations and other departmental referrals. Patients may initially succumb to physician demands for cutting-edge technology when less expensive technology would do an acceptable job without compromising quality. This might increase the 'average collection per new patients' but makes patient retention difficult. Clinics need to think carefully about the mix of supportive services they provide to patients, their cost, and whether a less expensive approach could achieve the same results.

Another important aspect which needs to be considered is whether a clinic can provide every service or whether they should specialise in certain key services. Modern

healthcare organizations should consider which services and programs they wish to emphasize, for which kinds of patients, and in which localities and then eliminate programs and other activities that do not fit that focus. Analysis of existing patient data will provide key insight into this.

Strategic trade-offs should also be evaluated in terms of competitive scope and pricing policy both of which can be defined from the existing patient data. The goal of organizations with a low-price strategy is to deliver a product of acceptable quality at a price below that of its competitors. By contrast, organizations with a high-price strategy select small market segments and offer services that are widely acknowledged as superior. It is important to assess based on previous data, which segment of the population the clinic is catering to before introducing these services.

Detailed analysis of patient data will also provide useful information for other managerial responsibilities like controlling and staffing. For example it will help in procuring the right supplies at the right time and in the right quantities so that there will not be any wastage or shortage. It will also help in identifying the bottle necks in patient flow and adequately staff such segments.

## CONCLUSION

Most of the clinics have a variety of data waiting to be explored in their computerised patient records. A detailed analysis of this data with respect to the patient type, departments, doctors and procedures can provide key insights, which may be invaluable in strategic planning.

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Fig 1. Table design view of MS Access.

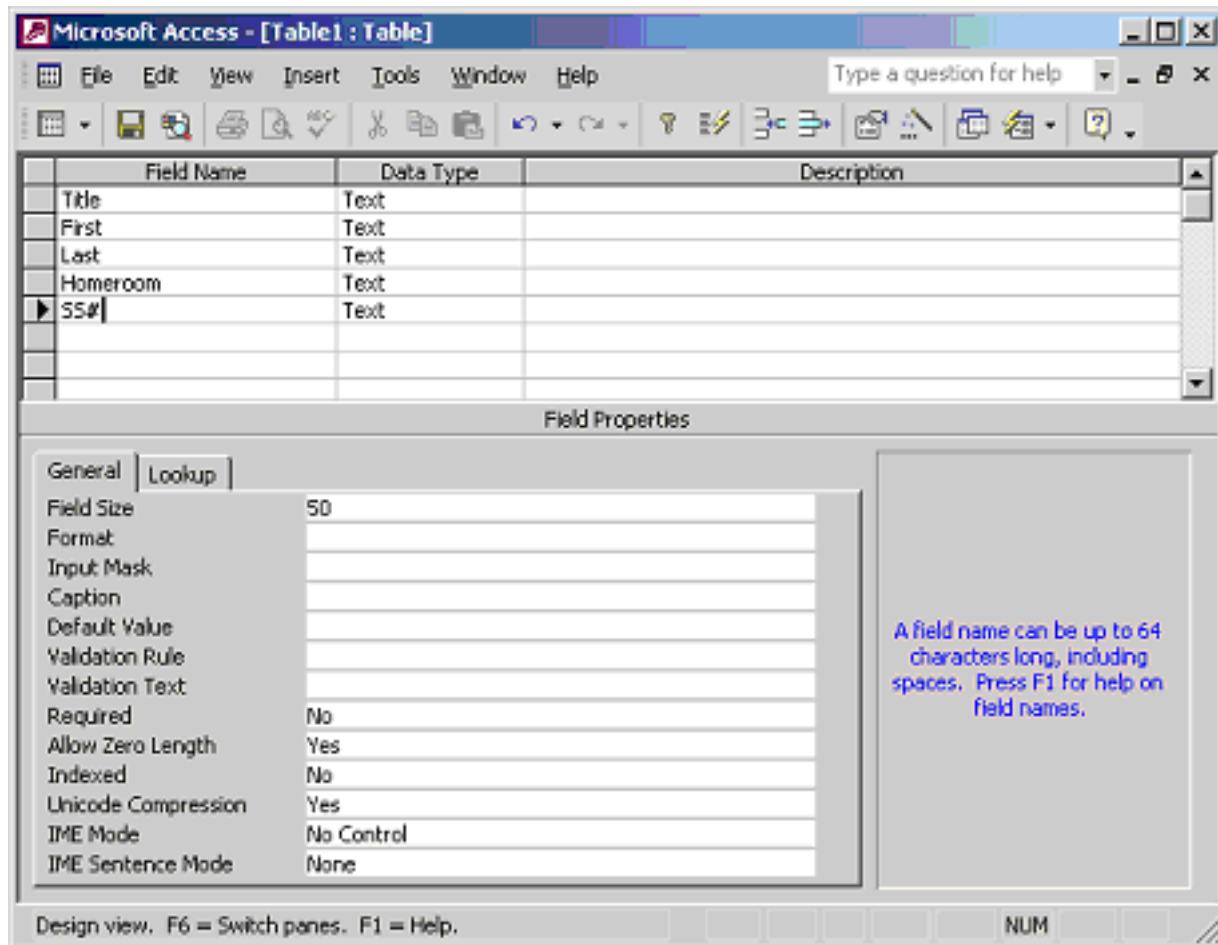


Fig 2. Query design view of MS Access

