DIETARY PATTERNS;
PRECURSOR OF HEALTH BEHAVIORS DURING CHRONIC ILLNESS

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Article received on:
25/02/15
Accepted for publication:
31/03/2015
Received after proof reading:
02/06/2015

ABSTRACT… In order to promote healthful trends, insight is needed in the behavioral determinants of nutrition behaviors. Most research on behavioral determinants has been linked with individuals' physical health and socio-economic factors. However, health behavior is influenced by individual physical health and abilities. Multiple dynamics of chronic illnesses within human body influenced the dietary patterns. For disease prognosis, doctors advised patients to observe preventive measures. **Objective:** The researchers tried to identify the changes in the dietary patterns protective effects of food consumption such as mutton, chicken, beef, snacks and sweets on chronic illnesses that reduce the risk factors and contribute in the patients' health behaviors. **Setting:** The empirical data was collected from three Dialysis Units: Mayo Hospital, Jinnah Hospital, Lahore General Hospital and all admitted patients of Punjab Institute of Cardiology, Lahore. **Methodology:** These four hospitals have good turn-over of the patients should in this exploratory study, purposive sampling method was used. For the collection of quantitative data, a hospital-based survey was conducted by using a structured interview schedule. **Study Subjects:** 275 patients (131-cardiac and 144-renal failure) including 184 males (67%) and 91 females (33%) between age of 20 to 110 years were interviewed. Age mean ± standard deviation was 44 years; S.D = 15.338. **Data Analysis:** Descriptive statistics (frequencies, percentages) and multiple response tables were deployed to find out the research goals across heart and kidney diseases. **Results:** Results indicates that before illness, majority 238 (86.5%) of the patients took three meals. After illness, 34% patients changed the food consumption. In two meals, 96.7% patients used vegetables, 86.2% used pulses along with chapatti, and 98.5% used tap water to drink. In other drinks, 87.6% used tea, 50.5% used milk, and 52% used to drink lassi. A high proportion (65%) of patients for first treatment consults with GP's. 10.6% changed their food consumption on the advice of hakeem/homeopathic and 10.6% changed on the advices of others. 78% were unable to perform their daily activities and need help; 89% patients changed food choices; and 86% patients follow doctors' advices. **Conclusion:** Change in diet is a contributing factor towards health and well-being during illness. It reduces risk factors and a good indicator of patients' health behaviors to cope with the disease.

Key words: Dietary Patterns, Food consumption, Health Behavior, and Chronic Illness

Article Citation: Yasmeen B, Jamshaid N, Khan MZ, Salman M, Razaullah. Dietary patterns: precursor of health behaviors during chronic illness. Professional Med J 2015;22(6):811-817.

INTRODUCTION

Diet is the key of health. Healthy diet reflects healthy life style. Good nutrition nourishes body. Around the globe, culturally and traditionally, there is a variety of food for healthy bodies. Selection of food depends on the individuals' choice and taste. Socio-economic culture and traditions increase individuals' knowledge, preferences and choices. Other than culture and traditions, studies have been identified six key determinants: biological, economic, physical, social, psychological, attitude, beliefs, and knowledge about food.[1,2] The two most important factors that influence the human life are health and illness. Illness directly influences health and well-being. Short term or long term illness, disease progression altered life style, food preferences, eating habits and routine activities. The greater physiological wear and tear reduces the life enjoyment with healthy bodies. Chronic disease is almost always proceeding by a period of declining health in human bodies and the systems. In the context of chronic diseases,

studies reported an inverse association of healthful dietary patterns with all-cause mortality and cardiovascular disease risk.[3]

According to WHO/FAO (2003)[4] report on "Green Facts" for disease prevention and control"… changes in diets are needed to cope with the burgeoning epidemic of chronic diseases. Chronic diseases are largely preventable diseases. Public health approach of primary prevention is considered to be the most cost-effective, affordable and sustainable course of action to cope with the chronic disease epidemic worldwide". For coping patients' make food choices based on what is beneficial to control disease progression, change their life patterns and eating behaviors for health and well-being. Functional Medicine seeks to address declining health. It provides the foods and nutrients need to restore bodies function. Aim is to stop the progression of the disease.[5] The World Bank report (1992)[6] on Global Burden of Disease mentioned that 16% of deaths were due to malnutrition. Many researchers now believe that declining health problems during chronic illness are partly related to diet. For example Tatiana 2007[7] study shows the importance of optimal mineral balance and how a deficiency in mineral balance can contribute to the development of congestive heart failure. "….. While they used to believe that diseases-such as type II diabetes, obesity, heart disease, stroke, and certain cancers were caused by a single gene mutation, they are now generally attributing these conditions to a network of biological dysfunction". Food we eat is a key factor in that dysfunction in part because our diets lack the necessary balance of nutrients.[8,9,10]

Cardiovascular and Kidney diseases have identical root causes. During illness, knowledge and awareness about food choice and consumption shapes psychological adaptation that leads towards the beneficial effects in diet and well-being. To maintain health and well-being, nutritional approach is an essential consideration for all as diet plays a key role for health and well-being.[11,4] Therefore; similar preventive measures need to be adopted to prevent the onset of chronic diseases. The researcher tried to find out the consumption and changes in diet during chronic illnesses to prevent the onset of diseases that affect the patients' health and well-being.

Research Methodology and Data Used
Cross-sectional survey was conducted with 275 admitted patients (131-heart and 144-kidney) 184 (67%) male and 91 (33%) female (20 to 110 years of age) by using a structured interview schedule. The researcher used purposive sampling method to collect the data from admitted male/female patients by keeping in view 100% accessibility and availability of the respondents.

Data Sources
Four Government hospitals: Lahore General Hospital, Mayo Hospital, Jinnah Hospital, and Punjab Institute of Cardiology (PIC), Lahore were used as a main source to obtain the subjects for the study.

Respondents
In this study 275 interviews were conducted. Out of 275, 131 interviews were conducted from the heart patients (70% males and 30% females) and 144 interviews were conducted from the kidney patients (64% males and 36% females).

Instrument
An index of eleven item scales was constructed to ask about patients' diet and food consumption i.e. mutton, chicken, beef, snakes, sweets, rice, vegetables, tea, milk, fruit juices etc before and after the disease diagnosis. Change in diet indicates health behavior patterns, reduction in the risk factors, prognosis, and control for disease progression.

Data Analysis
Frequencies and percentages were calculated in multiple response tables.

RESULTS
Change in Dietary Patterns
It is generally observed that chronic illness bring physical, psychological, behavioral, and social changes in individual's that reflected in day to day living, influence diet and activities. Type of

food, quantity and performance of activities were considered important to maintain health during illness. For broader picture of dietary patterns and food consumption, data was collected about the number of meals, food items, and types of drinks and the performance of daily activities. Table-I shows the number of usual meals before and after illness by disease.

No. of Usual	Before Illness			After Illness			Change	
Meals	Heart	Kidney	Total	Heart	Kidney	Total	Heart	Kidney
	%	%	%	%	%	%	(%+/-)	(%+/-)
Two meals	13.0	13.9	13.5	32.0	36.1	34.1	+147.06	+160.00
Three meals	87.0	86.1	86.5	67.9	63.9	65.8	-21.93	-25.81
N	131	144	275	91	144	275		

Table-I. Percent distribution of number of meals before and after illness by Disease

An overwhelming majority of the patients in both diseases took three meals before illness. Only 14% of the patients took two meals. In two meals, percentage of patients has been increased from 14% to 34% in both diseases. After illness, 66% were taking three meals. Results indicate reduction in three meals from -21.93% to -25.81% in both diseases to slow down the progression of the disease.

For in-depth information regarding the changes in food and type of drinks, data was collected about the mostly consumed items and use of drinks before and after illness presented in Table-II.

Eating		Before Illness			After Illness			Change	
		Heart	Kidney	Total	Heart	Kidney	Total	Heart	Kidney
								(+/-%)	(+/-%)
Mutton	Count	70	84	154	34	29	63	51.43	65.48
	%within Mutton	45.5%	54.5%		54.0%	46.0%			
	%within illness	53.4%	58.3%		26.0%	20.1%			
	% of Total	25.5%	30.5%	56.0%	12.4%	10.5%	22.9%		
Chicken	Count	80	102	182	83	86	169	3.75	15.69
	%within Beef	44.0%	56.0%		49.1%	50.9%			
	%within illness	61.1%	70.8%		63.4	59.7%			
	% of Total	29.1%	37.1%	66.2%	30.2%	31.3%	61.5%		
Beef	Count	75	86	161	22	16	38	70.67	81.40
	%within Beef	46.6%	53.4%		57.9%	42.1%			
	%within illness	57.3%	59.7%		16.8%	11.1%			
	% of Total	8.0%	5.8%	13.8%	27.3%	31.3%	58.6%		
Pulses	Count	113	124	237	84	66	150	25.66	46.77
	%within Pulses	47.7%	52.3%		56.0%	44.0%			
	%within illness	86.3%	86.1%		64.1%	45.8%			
	% of Total	41.1%	45.1%	86.2%	46.5%	48.7%	95.3%		
Rice	Count	78	87	165	46	23	69	41.02	73.56
	% within Rice	47.3%		52.7%	66.7%	33.3%			
	% within illness	59.5%		60.4%	35.1%	16.0%			
	% of Total	28.4%	31.6%	60.0%	16.7%	8.4%	25.1%		
Sweets	Count	48	57	105	13	13	26	72.92	77.19
	% within Sweets	45.7%	54.3%		50.0%	50.0%			
	% within illness	36.6%	39.6%		9.9%	9.0%			
	% of Total	17.5%	20.7%	38.2%	4.7%	4.7%	9.4%		
Snacks	Count	40	46	86	11	12	23	72.50	73.91
	% within Sweets	46.5%	53.5%		47.8%	52.2%			
	% within illness	30.5%	31.9%		8.4%	8.3%			
	% of Total	14.5%	16.7%	31.2%	4.0%	4.4%	8.4%		

Table-II. Percent distribution of mostly eaten items by Patients before and after illness by Disease

Note: Percentages and totals are based on respondents. Dichotomy group tabulated at value 1.

A vast majority of the patients used mutton and beef, vegetables and pulses along with chapatti in meals before illness (Table-II). After illness, a large number of the patients were not taking mutton and beef (red meat). This significant reduction was due to the illness. A low proportion of the patients continue to take mutton and beef in both diseases which represent their food choices and preferences and non-compliance of their doctors' advices. Heart patients increased the use of chicken (white meat) whereas minimal use among kidney patients. It was observed that cardiologists usually advice to take white meat instead of red meat. Other significant change was in the use of sweets and snacks. Studies of Rolls 1997 & 2000[12,13] and Cambell 1994[14] regarding dietary approaches and etiology of onset of disease indicates that food containing sugar and fats are harmful for health. Count and percentages indicates that most of the patients modified diet and changed food choices to prevent from complications generated by food.

Drinks			Before Illness			After Illness			Change	
			Heart	Kidney	Total	Heart	Kidney	Total	Heart	Kidney
Tea	Count		116	125	241	11	91	202	+90.52	+27.2
	% Within Tea		48.1%	51.9%		55.0%	45.0%			
	% Within Illness		89.9%	88.7%		86.0%	73.4%			
	% of Total		42.8%	46.1%	88.9% 43.9%	36.0%	79.8%			
Milk	Count		77	62	139	39	32	71	+49.35	+48.39
	% Within Milk		55.4%	66.6%		54.9%	45.1%			
	% Within Illness		59.2%	44.0%		30.2%	25.8%			
	% of Total		28.4%	22.9%	51.3% 15.4%	12.6%	28.0%			
Lassi	Count		72	143	25	25	50		+65.28	+64.79
	% Within Lassi		50.3%	49.7%		50.0%	50.0%			
	% Within Illness		55.4%	50.4%		19.4%	20.2%			
	% of Total		26.6%	26.2	52.8% 9.9%	9.9%	19.8%			
Fruit Juices	Count		53	40	93	28	29	57	+41.17	+27.5
	% Within Fr. Ju		57.0%	43.0%		49.1%	50.9%			
	% Within Illness		40.8%	28.4%		21.7%	23.4%			
	% of Total		19.6%	14.8	34.3% 11.1%	11.5%	22.6%			
Beverages	Count		53	50	103	20	23	43	+62.26	+54.0
	% Within Bever.		51.5%	48.5%		46.5%	53.5%			
	% Within Illness		40.8%	35.5%		15.5%	18.5%			
	% of Total		19.5%	18.5%	38.0% 7.9%	9.1%	17.0%			

Table-III. Other than water, use of drinks by Patients before and after illness by Disease

Note: Percentages and totals are based on respondents. Dichotomy group tabulated at value 1.

Type of Drinking Water	Before Illness			After Illness			Change	
	Heart %	Kidney %	Total %	Heart %	Kidney %	Total %	Heart (+/-%)	Kidney (+/-%)
Boiled / Mineral	2.3	6.3	4.4	34.8	4.17	41.5	-1400.00	+33.33
Tap	66.9	77.8	73.1	46.9	43.8	45.1	+31.46	+43.75
Hand Pump / Other source	29.3	16.0	22.5	18.8	8.3	13.5	+35.90	+47.83
Other Resources N	131	144	275	131	144	275		

Table-IV. Percent distribution of Type of Drinking Water by Disease before and after illness

Drinks other than water, majority 88.9% used tea and 52.8% lassi before illness in both types of patients (Table III). After illness, there was a significant decrease in the use of drinks: 23.3% in the milk, 33% in the lassi, 11.7% in the fruit juices, and 21.0% in the use of beverages. After diagnosis, count (202) and percentages (79.8%) presents that majority continue to use tea as a

drink. Overall decline in the use of other drinks indicates that there was a significant reduction in milk related drinks among heart patients whereas kidney patients were not using other drinks such as fruit juices and beverages on their doctor advice for little intake of liquids. Data shows (Table-V) that two-third of the patients used tap water to drink before illness in both diseases. After diagnosis especially in heart patients there was a significant change in the type and use of drinking water that is up to 1400% increase in the use of boiled or mineral water. Minor changes were observed in other types of drinking water among heart patients. These changes might be due to the non-affordability or accessibility of patients to boil or mineral water. Changes in all types of water (boiled/mineral, tap, and hand pump/other source) among kidney patients after illness indicates a little intake due to disease and treatment requirements.

For changes in health behavior, results (Table-V) indicates:

Health Behaviors	Heart		Kidney		Total	
	F	%	F	%	F	%
Perform activities daily						
Yes	128	97.7	136	94.4	264	96.0
No	3	2.3	8	5.6	11	4.0
Change eating habits						
Yes	115	87.8	132	91.7	247	89.0
No	16	12.2	12	8.3	28	10.2
Act on the advice of						
Doctor	105	80.2	130	90.3	235	85.5
Hakeem/ Homeopathic	3	29.4	8	5.6	11	10.6
Others	23	17.6	6	4.2	29	10.6
Table-V. Changes in Health Behaviors						

Results (Table-V) indicates that majority of both type of patients were unable to perform their daily activities. A vast majority 85% of the patients had changed their food choices. A low proportion of both types of patients follow the advices of hakeems or homeopathic and others.

SUMMARY
Results indicates that before illness, majority 238 (86.5%) of the patients took three meals.

After illness, 34% patients changed the food consumption. In two meals, 96.7% patients used vegetables, 86.2% used pulses along with chapatti, and 98.5% used tap water to drink. In other drinks, 87.6% used tea, 50.5% used milk, and 52% used to drink lassi. A high proportion (65%) of patients for first treatment consults with general practitioners (GP's). Ninty six percent patients were unable to perform their daily activities, 89% patients had changed their diet, and 86% patients acted on the advice of their doctor, 10.6% had changed their food consumption on the advice of hakeem/homeopathic whereas 10.6% had changed on the advices of others.

DISCUSSIONS
For medical regime compliance, modifications in diet indicate patients' health behavior to reduce the risk factors and efforts for well-being. For the prevention and chronic conditions, eating habits and physical activities can help patients' to cope with the disease, to avoid complications and also to prolong life span as recommendations have been given in the WHO/FAO 2003[4] report and the World Health Assembly resolution 2002.[5]

To reduce the risk factors, most of the patients changed food preferences and consumption in diet. A good trend was observed. Majority of patients' prefer vegetables and pluses with chapatti. Instead of three meals they took two meals. Results indicate an increase in the use of white meat (chicken) and reduction in mutton, beef (red meat), snacks and sweets. These findings relates with several large cohort studies which indicates intake of trans-fatty acids increases the risk of coronary heart disease.[12,13,14,15]Heart patients (male and female) increased the use of boiled or mineral water whereas kidney patients' intake was very little. The study of Campbell and Junshi 1994[14,16, 17,18]supports these results. In other drinks, majority of the heart patients were using tea and reduced the use of milk, lassi, juices and beverages. Health behaviors such as engaging in physical activity are known to influence physical health outcomes.[8] Majority (96 %) patient of both diseases were able to perform daily activities that is helpful to reduce risk factors

of chronic diseases. Results indicate that change in diet is a contributing factor towards health and well-being.

CONCLUSIONS

This study showed that change in diet and food consumption is a contributing factor towards health and well-being. A number of scientific studies USA[19-21], Canada[22], Germany[23], Portugal[24], Iran[25], or other Asian countries[26,28] provide a sufficient strong and plausible basis to justify the prevention and control in chronic illness. These studies explain increasing public health problems of chronic diseases and stressed on prevention and control which is the only key to promote appropriate diets[17,18], physical activity[29,30] and healthy lifestyles.

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