Impact of health education on compliance among patients of chronic diseases in Al Qassim, Saudi Arabia

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Abstract

Objective: The aim of this study is to assess the impact of health education on diet, smoking and exercise among patients with chronic diseases (coronary artery disease, hypertension and type 2 diabetes mellitus) in Al Qassim Region in Saudi Arabia.

Methods: We used data from a clustered experimental study in selected primary health care (PHC) centers in Al-Qassim. The study was conducted during January to October 2009 to assess the impact of an enhanced health education program on smoking, diet and exercise. The intervention comprised refresher training of PHC centers' staff to improve communication skills and use of health education materials. Special health education sessions in the PHC centers were also organized with the help of medical students from Qassim University. Target population included patients of chronic diseases as well as patients visiting for other complaints. Baseline and end-line surveys were conducted to assess the impact of health education program on the prevalence of smoking, unhealthy diet and physical inactivity. The sample size was estimated to detect the impact of health education on these risk factors. Data were analyzed using SPSS (version 11.5) to conduct multivariate analysis to assess the impact of health education among chronic disease patients.

Results: At baseline, chronic disease patients had generally healthier diet and did more exercise than patients of other diseases. Among chronic disease patients, significant improvements in smoking, diet and exercise habits were observed at end-line survey compared to baseline. These changes persisted after controlling for age, sex, marital status and education.

Conclusion: We conclude that health education for patients visiting the PHC centers for follow-up of chronic diseases will significantly improve compliance to doctor's advice regarding smoking, diet and exercise.

Key words: health education; lifestyle chronic diseases

Running title: Impact of health education on lifestyles of chronic disease patients

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Introduction:

Non communicable diseases such as diabetes, hypertension, obesity and coronary artery disease are on the rise in Saudi Arabia during recent years, which is attributed mainly to changes in the lifestyles; lack of exercise and unhealthy dietary patterns are believed to be responsible for the shift in the disease patterns in recent decades. Decreased physical activity, unhealthy diet (such as a preference for fatty food, bakery items and excessive use of dates, etc.), a culture of fast food and increasing popularity of soft drinks and artificially sweetened fruit juices, and smoking are becoming a part of the culture in Saudi Arabia. All of these factors have a direct impact on the risk of obesity, coronary artery disease (CAD), hypertension and type 2 diabetes mellitus [1]. Lifestyle changes are the largest challenge to health status of the population in Saudi Arabia[2]. World Health Organization (WHO) estimates that non-communicable disease will soon become the principal global cause of morbidity and mortality in Saudi Arabia. Unfortunately, patients of chronic diseases often time fail to make changes in dietary habits and increase physical activity, as advised by their doctors after the diagnosis is confirmed. This leads to a higher risk of complications, particularly among patients of type 2 diabetes and hypertension.

Health education to patients of chronic diseases, both in the form of tailored patient education, or participation in health education seminars on general topics, have a profound effect on the patient's knowledge and understanding of the risk involved with carelessness about their health. Compliance to the doctor's orders with regard to the pharmacological treatment regimen, as well as brining about fundamental and lasting changes in the lifestyle play a central role in prolonging survival and improving quality of life. A large number of studies are now available on the effects of health education on patient compliance. In a meta-analysis conducted in the early 1980s, a total of 320 articles on patient education were screened to assess the magnitude of experimental effects of patient education on compliance and improvements in lifestyle. Summary of all experimental effects showed patient education was the most successful in altering compliance[3]. In UAE a comprehensive integrated community-based intervention program for non-communicable diseases prevention and health promotion was successful in addressing diet related diseases. The interventions addressed primary, secondary, and tertiary prevention levels[4]. Another review study suggests that collaborative health education interventions are the best practice for the management of nutrition-related chronic diseases[5][6].

Primary health care (PHC) centers in Saudi Arabia play the most important part in secondary prevention of non communicable diseases. The

PHC approach is to consider the people custodians of their own health, and to empower them with the information to make decisions for their health and lifestyle. Thus the people themselves decided about their daily life activities and routines to ensure achievement of good health[7]. The principle of PHC is that everyone has the right to receive health services; which should be practical, effective and low-cost. Health education and awareness is the most effective way to disseminate information and encourage people to adopt healthy lifestyles. Adoption of a healthy lifestyle not only helps in the prevention of diseases, but also in reducing the risk of complications resulting from these diseases. However, the most important role of health education is on patients of chronic diseases (most commonly, diabetes and hypertension) who routinely visit the PHC centers for follow-up and replenishment of their drug supplies. This gives an excellent opportunity for health education that provides the tools for prevention at the primary and secondary levels.

In this paper, we present the results of a health education intervention in selected PHC centers of Al Qassim province of Saudi Arabia, whereby the doctors and health educators, as well as other paramedical workers, were trained in providing information and education to their patients in a comprehensive and effective manner. In particular, we focused on the patients of three chronic diseases, namely, hypertension, type 2 diabetes mellitus and coronary artery disease.

Among these patients, health education was directed to avoid complications, improve lifestyles and ensure compliance to the doctor's instructions with regard to diet, smoking and exercise.

Methodology:

The objective of this study is to assess the impact of health education on the health knowledge and behavior of patients of three chronic diseases (hypertension, type 2 diabetes mellitus and coronary artery disease) in selected PHC centers of Al Qassim province of Saudi Arabia.

We use the data from a clustered experimental study conducted in 15 PHC centers in Al Qassim province during January-October 2009. The study was designed to assess the impact of a health education program about risk factors of non-communicable diseases. The study included a baseline survey to establish the prevalence of common risk factors of chronic diseases, which was followed by a 6-months long intervention period. During the interventions, the patients received health education at the PHC centers from their doctors and health educators, who had received intensive refresher training in health education techniques and inter-personal communications skills. The objective of the training was to significantly improve the healthcare providers' knowledge and skill with regard to health education. An end-line (follow-up) survey was conducted at the end of the

intervention period, which used the same questionnaire as at the baseline. The data from the two surveys were compared to assess the impact of the intervention on knowledge, attitudes and practices of respondents with regard to the known risk factors of chronic diseases, focusing mainly on diet, smoking and exercise. The target population for the intervention and for both surveys comprised the patients visiting the PHC centers for any reason.

The questionnaire was developed according to international standards although no detailed questions on food frequency measurement of physical activity were included. It was translated into Arabic and was pretested. The questionnaire included sections on socio-demographic information (age, sex, education, marital status and occupation), dietary habits, food items consumed during preceding 24 hours, exercise and smoking and also included questions on knowledge about common risk factors of chronic diseases.

Calculation of the sample size was based upon the assumption that respondents with 'good' behavior with regard to diet, smoking and exercise will constitute 50% ± 10% (40 – 60%) of the target population. Assuming 95% confidence interval (α = 0.05), we calculated sample size of 100 per PHC center for each survey. The questionnaires were administered to the first 100 patients (male or female) visiting the PHC center during a pre-specified period of time: In each PHC centers, certain days of the week were assigned to collect data during one month before intervention (baseline survey) and one month after the intervention (end-line survey). Each PHC center was required to complete 100 interviews; the interviews were carried out by doctors, who had excellent rapport with their patients.

Results

Nearly all PHC centers fell short of achieving the assigned target of 100 interviews per center before and after the intervention. The actual number of completed interviews was 1,254 in the baseline survey and 1,011 in the end-line survey.

Most of the respondents reported that they had received some form of health education (70.2% in baseline survey and 72.0% in end-line survey; P = 0.374).

Table 1 presents a comparison of dietary patterns (food items consumed during the past 24 hours), exercise and smoking between the patients of the three chronic diseases and patients who do not have any of the three chronic diseases. Patients of chronic diseases are more likely to do regular exercise (walking), less likely to eat French fries/potato chips and sweet and cakes and have soft drinks or juices, and are more likely to eat fresh vegetables and fruits. However, there is no significant difference in smoking and consumption of certain food items (e.g. Kabsa). Chronic disease patients are significantly more

likely to have dates during past 24 hours (P=0.003).

Table 2 presents the comparison of smoking, exercise and dietary patterns among chronic disease patients between baseline and end-line surveys. The prevalence of smoking at end-line survey is 7% compared to almost 14% at baseline; prevalence of having Kabsa, sweets and cakes and soft drinks/juices has also significantly reduced but consumption of French fries/potatoes has increased. There is no significant change in consumption of other food items (such as dates, fish, eggs, fresh vegetables and fruits) or in the exercise patterns. Although fewer patients in end-line survey reported that they have changed their diet recently, more of them did so because of concern about increase in weight and about their own health care.

Table 3 presents the results of logistic regression analysis, whereby the risk of smoking, exercise and consumption of certain food items during the 24 hours preceding the interview is estimated at end-line survey, with reference to baseline survey and after controlling for the effects of age, sex, marital status and education. Patients at end-line are nearly 40% less likely to smoke, eat Kabsa and have sweets and cakes but are 70% more likely to have French fries/potato chips. There is no significant change in the consumption of other food items or in the exercise patterns.

Discussion:

Our findings suggest that the health education intervention was successful in achieving some small but significant changes in the lifestyles among chronic disease patients in our target population. The dietary patterns improved, albeit with some strange results: there was an increase in the use of French fries, and no change in eating of dates. This might have been the result of misinformation, or misunderstanding on part of the recipients of health education. There was also no change in exercise patterns.

These improvements persist, and, in some cases, are enhanced after controlling for age, sex, marital status and education. We can say that these results are encouraging, considering that the health education intervention was of very short duration and was of limited scope and quality. A large-scale, effective and high quality health education program is likely to have much better results. Such a program is expected to reduce the burden of non-communicable diseases in Saudi Arabia.

The results from this study are similar to several other similar intervention studies. A review article of five studies on education and counseling with a nurse involved found that these interventions were partly effective in the increase of compliance among patients with common chronic diseases [8].

The association between health education and health outcomes was examined in a 4-year longitudinal, observational study of 2125 adult patients with chronic medical conditions (hypertension, diabetes, recent myocardial infarction, congestive heart failure). Patient compliance after health education was associated with improvement in health outcomes in this study[9].

This study points to improvement in communication skills and health awareness among service providers in primary health care centers that have promoted to educate patients about the dangers of unhealthy diet, danger of smoking and sedentary life style. The study recorded a modest impact on regular exercise, smoking, and dietary practices with clear indicators that this was associated with cost-effective intervention and health education has been provided. It is observed in our study the education did not have a significant impact on exercise, may be because there was significant difference before health education intervention among those who are having chronic diseases.

The conclusion of this study is that improving the quality of health education in primary health care centers had a large effect on raising the awareness and practices among the population in general, but particularly among patients of chronic diseases. It follows that specially designed patient education programs directed at such patients would have a much large effect; however, further research on a large scale

in this area is needed. It is recommended that refresher seminar and courses for the PHC staff be regularly conducted to enable them to carry out health education whether for groups or individuals. It is also recommended that the importance of involvement of medical students in such activities be recognized, in order to train them in preventive programs at an early stage in their careers, as well as instilling the importance of health education for them.

Limitations:

There are several limitations in our study: Firstly, a short period of health education; secondly, a simple random sampling scheme could not be adopted due to logistic difficulties; thirdly, the possibility of bias in the information given at the end-line survey cannot be excluded (patients exposed to health education and/or a similar interview at baseline are more likely to give 'adequate' answers to the questions). Although samples at baseline and end-line were independent of each other, the possibility of overlap between the two samples cannot be ruled out. Finally, it is expected that the impact of health education intervention may have been short-lived, as observed in several other studies[10].

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Table 1: Percentage distribution of patients of chronic diseases and other patients by dietary practices, smoking habits and exercise, Baseline Survey

Respondent characteristic	Baseline Survey		Significance[2]
	Patients of chronic diseases[1]	*Patients of other diseases*	
Smoking (males only)	13.8	13.3	NS
Doing regular exercise:			
Any exercise	49.5	65.1	P=0.006
Walking	43.2	31.3	P<0.001
Brisk walking	5.9	5.6	NS
Food items consumed during past 24 hours[3]:			
Meat *kabsa*	82.8	77.1	NS
Roasted meats	21.0	22.9	NS
French fries/potato chips	13.3	27.7	P=0.001
Fish	13.6	10.8	NS
Eggs	31.7	26.5	NS
Fresh vegetables	58.6	43.4	P=0.007
Snacks and appetizers	36.2	36.1	NS
Juices / beverages	20.6	33.7	P=0.003
Diet juices / beverages	13.8	16.9	NS
Dates (≥ 7 per day)	52.9	36.1	P=0.003
Sweets and cakes	26.5	36.1	P=0.050
Fresh fruits	67.4	56.6	P=0.039

1 Patients suffering from hypertension, type 2 diabetes and coronary artery disease

2 Statistical significance of difference between the two categories of patients

3 Excludes respondents who said that food consumed in last 24 hours was not a reflection of their routine diet.

NS Not significant (P > 0.05)

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Table 2: Percentage distribution of patients of chronic diseases[1] by smoking habit, exercise and dietary patterns, before and after the intervention

Respondent characteristic	Baseline Survey	Follow-up Survey	Significance[2]
Smoking (males only)	13.8	7.1	P=0.002
Doing any regular exercise	49.4	44.8	NS
Food items consumed during past 24 hours[3]:			
Meat *kabsa*	82.8	70.1	P=0.006
Roasted meats	21.0	20.2	NS
French fries/potato chips	13.3	20.2	P=0.007
Fish	13.3	16.9	NS
Eggs	31.7	33.8	NS
Fresh vegetables	58.6	64.4	NS
Snacks and appetizers	36.2	37.5	NS
Juices / beverages	20.6	14.8	P=0.024
Diet juices / beverages	13.8	11.5	NS
Dates ($\geq$ 7 per day)	52.9	52.9	NS
Sweets and cakes	26.5	20.8	P=0.042
Fresh fruits	67.4	63.7	NS
Attempted to change diet recently	49.5	42.9	P=0.039
Reasons for change in diet:			
Doctor's advice	51.6	38.1	
Worried about weight increase	19.2	27.3	P=0.04
Care about one's health	29.2	34.5	

1 Patients suffering from hypertension, type 2 diabetes and coronary artery disease

2 Statistical significance of difference between the two categories of patients

3 Excludes respondents who said that food consumed in last 24 hours was not a reflection of their routine diet.
NS Not significant ($P > 0.05$)

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Table 3: Adjusted odds ratios (AORs) derived from logistic regression analysis, measuring the impact of intervention among patients with chronic diseases[1]

Respondent characteristics	AOR[2]	Remarks
Smoking (males only)	0.57 (0.34 – 0.96)	Decreased
Food items consumed during past 24 hours[3]:		
Meat *kabsa*	0.56 (0.39 – 0.81)	Decreased
French fries/potato chips	1.70 (1.14 – 2.54)	Increased
Roasted meats	1.01 (0.69 – 1.47)	No change
Fish	1.01 (0.98 – 2.07)	No change
Fresh vegetables	1.36 (0.98 – 2.07)	No change
Snacks and appetizers	1.03 (0.76 – 1.39)	No change
Dates ($\geq$ 7 per day)	1.04 (0.77 – 1.40)	No change
Sweets and cakes	0.62 (0.43 - 0.89)	Decreased
Fruits	0.95 (0.70 – 1.31)	No change
Exercise (any regular exercise)	0.81 (0.59 – 1.01)	No change

1 Dependent variable is binary (e.g. smoking/not smoking); the reference category is the baseline; the AOR reflects the likelihood of (e.g.) smoking at the end-line survey, compared to the baseline survey;

2 Each estimate is adjusted for age, sex, educational level and marital status

3 Excludes respondents who said that food consumed in last 24 hours was not a reflection of their routine diet.

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