



# Barriers to Changing Dietary Behavior

Kavita Kapur\*, A Kapur\*\*, Shobhana Ramachandran\*\*\*, V Mohan\*\*\*\*, SR Aravind+, M Badgandi++, MV Srishyla+++

## Abstract

Dietary change requires giving up long established patterns of eating behavior and acquiring new habits. 'Non-compliance' to diet advice may be a result of inability to provide diet self-management training and getting the right messages across to change eating behavior. Using a pre-tested questionnaire based interview, we carried out a study amongst 350 adults (> 20 years) with type 2 diabetes from two metro cities in South India, who had previously received diet advice with the objective to understand perceptions, attitudes and practices, as well as study factors that enhance or reduce compliance to diet advice. Ninety six patients (28%) followed diet for the full duration of diabetes (Group 1), 131 (38%) followed diet for a partial duration varying between more than a quarter to three quarters of the total diabetes duration (Group 2) and 115 (34%) did not follow diet advice (Group 3) – followed for a duration less than a quarter of their diabetes duration.

Study results show that many factors both patient and health care provider related influence outcomes of dietary advice. Factors that have a positive impact on compliance are – older age, shorter duration, nuclear family, good family support, less busy work life, higher health consciousness, advice given by dietician, more frequent visits to dietician, advice that includes elements to promote overall health not merely control of blood sugar, diet counseling that is easy to understand and use and includes healthy food options, cooking methods, practical guidance to deal with lifestyle issues. We conclude that patient barriers related to life circumstance are mostly non-modifiable, most modifiable barriers are related to behavioural aspect and the inability of the health care provider to provide individualized diet advice and self management training. Efforts must be made to improve counseling skills. ©

## INTRODUCTION

To effectively manage their condition, persons with diabetes have to learn and practice new, complex, uncommon behaviors like blood sugar monitoring, taking medications (self injecting), keeping track of meal times, diet and exercise, besides dealing with their routine work, social and family life. This calls for adjustment to previously established life style. Adherence to a regimented and monitored way of living for long periods is difficult and requires resolve, encouragement and continuous reinforcement.

If patients are unable to follow instructions, the health professionals typically blame them as being 'non compliant',

or 'non co-operative' while patients feel that health professionals do not approach the problem in a 'realistic and practical manner' leading to mistrust and mutual lack of respect. Instead of blaming patients, non-compliance should be viewed as a feedback, which tells us that our current approach is not working and it is time to try another approach. A very common area of 'non-compliance' is diet advice; the reason may well be our inability to provide diet self-management training and getting the right messages across. Achieving dietary change requires giving up long established patterns of eating habits and behavior and acquiring new tastes and habits. To be effective diet self-management training must be individualized to suit the individuals' lifestyle, likes and dislikes and must be reinforced to be able to achieve agreed goals. This requires team work in which the person with diabetes must be a part. Of late there is a lot of interest in understanding the factors that influence change behavior in chronic diseases like diabetes. We carried out a study to understand these factors in relation to dietary behavior in the Indian setting.

## Objective

Using a pre-tested questionnaire based interview, we carried out a study amongst adults with type 2 diabetes

\*Dietician and Educator, Steno Diabetes Centre, Denmark. \*\*Managing Director, World Diabetes Foundation, Denmark. \*\*\*Vice President, India Diabetes Research Foundation and Joint Managing Director, Dr. A Ramachandran's Diabetes Hospitals, Chennai. \*\*\*\*Chairman Madras Diabetes Research Foundation and Dr Mohan's MV Diabetes Specialties Centre, Chennai. +Diabetologist and Physician, Diacon Hospital, Bangalore. ++Consultant Diabetes, Endocrinology, Obesity and Metabolic Medicine, Manipal Institute of Diabetes, Endocrinology and Research, Bangalore. +++Senior Intl. Medical Advisor, Novo Nordisk A/s, Denmark.

Received : 12.8.2005; Revised : 25.1.2007;  
Accepted : 29.11.2007

from two metro cities in South India. The objective of the study was to understand perceptions, attitudes and practices, as well as the factors that enhance or reduce compliance to diet advice.

## MATERIALS AND METHODS

350 adults (> 20 years) with type 2 diabetes of at least six months duration who had previously received diet advice and attending outpatient services of four large diabetes clinics in two metro cities in South India were taken for the study. The study design was an initial listing followed by a qualitative survey using a structured questionnaire. To avoid selection bias, consecutive patients attending the outpatient clinics at the selected centers, fulfilling the listing criteria were interviewed. Questions assessed patients' willingness, and ability to follow the advised diet plan and the reasons behind it, their perception of the importance of the advised diet in overall management of their health and their diabetes; questions also assessed quality of advice, what was told, what was easy and difficult to change. Information on age, sex, education, income, diabetes duration, type of treatment, presence or absence of complications, family and socio-economic environment were collected to assess its impact on compliance to diet advice.

The interviews were conducted by one of the authors (Kavita Kapur) or by dieticians and educators neither involved in the given patient's current care nor in the initial diet advice, in the person's native language or in the language the subject was most comfortable with. At least 5 patients were interviewed separately by 2 different interviewers and questionnaires filled in duplicate and examined to check for validity.

Data from the questionnaires were transferred manually to the computer and analyzed.

## Statistical analysis

Patients were divided into three arbitrary groups based on their self reported duration of adherence to advised diet.

- Group 1 FDFD – followed diet for the full duration of diabetes since first diagnosed – (n = 96) (28%)
- Group 2 FDPD – followed diet for a partial duration varying between more than a quarter to three quarters of the total diabetes duration – 131(38%)
- Group 3 DNFD – followed diet for a duration less than a quarter of their diabetes duration 115 (34%)

Incomplete data from 8 patients was rejected from analysis. Continuous data were analyzed for differences among the 3 groups using One-Way ANOVA followed by a Bonferroni multiple comparisons test (pair wise comparisons). If the differences were significant, the changes in above measures between two groups (1 vs 2, 2 Vs 3, 1 Vs 3) were compared using independent samples t-test. All categorical data were analyzed for differences among the 3 groups using Chi-square test. Where ever the Chi-Square test failed due to expected cell frequencies less than 5, the log-likelihood ratio test was used. All differences were considered significant at a p-value of < 0.05. Statistical analysis was done using Epi Info™, Version 3.3.2.

## RESULTS

Table 1 gives the patient characteristics in the three groups. There were no major difference in the characteristics of the whole population and each individual group; however, there were some differences between the three subgroups.

The barriers to compliance to dietary advice in the study can be classified into two main classes - Patient related and health care professional and health care delivery system

Table 1 : Patient characteristics

	n=342 All	n=96 (FDFD) Group 1	n=131 (FDPD) Group 2	n=115 (DNFD) Group 3	P value
Income in INR ± SD	22137 ± 62637	23977 ± 102055	20068 ± 45717	22885 ± 25326	NS
Males %	55%	51% (49)	50% (65)	65% (75)	P=0.03
Females%	45%	49% (47)	50%(66)	35%(40)	
Mean Age in Yrs ± SD	53.6 ± 10.2	54.8 ± 10.2	55.2 ± 10.0	51.0 ± 11.4 <sup>1</sup>	P<0.05
Mean Diabetes Duration in Yrs ± SD	8.9 ± 6.5	7.5 ± 6.6	10.7 ± 6.8 <sup>2</sup>	8.0 ± 11.4 <sup>3</sup>	P<0.05
College Education	45%	45%	39%	53%	NS
Nuclear Family	59%	69% (66)	57% (75)	54% (62)	NS
Associated problem / Complication	39%	32%	50%	34%	P=0.01
Drug Therapy	98%	97%	98%	98%	
OAD	65%	74%	50%	73%	NS
OAD+Insulin	27%	21%	37%	20%	P=0.002
Insulin alone	6%	2%	11%	5%	P=0.02
Vegetarians	40%	41% (39)	36% (47)	44% (51)	NS
Food cooked separately	20%	13%	34%	10%	P<0.05
Family support					
All Eat Same Food	39%	50%	32%	39%	P=0.02
Some Eat Same Food	22%	15%	24%	27%	NS
Nobody Eats Same Food	38%	35%	44%	34%	NS

1:Group 1 Vs 3 and Group 2 Vs 3 p<0.05; 2:Group 1 Vs 2 p<0.05; 3:Group 2 Vs 3 p<0.05

related.

**Patient Related (Table 2)**

- Lifestyle – young, males, perhaps have a busy lifestyle, this group of patients found it difficult to follow regimented inflexible printed diet charts. On the other hand elderly less active people were more prepared to accept regimented plans.
- Health consciousness and understanding the role of food in health and fitness plays an important role in compliance. (Fig. 1 Why is diet control important to you).
- Family support – Support for changing eating behavior is more likely to happen in a nuclear family compared to a large family. When food is not cooked separately for the person with diabetes and the whole family eats the same food, compliance is likely to be better. Often physicians and dieticians fail to promote diabetes diet as a healthy eating plan for the whole family and to highlight its role in preventing diabetes, obesity and cardiovascular diseases in other members of the family, especially children who are at risk because of diabetes in the family. Compliance is less likely when food is cooked separately for a person with diabetes, especially if the person is an elderly dependent. Also when not cooked separately patients may find it to difficult to follow the advised printed diet chart. Counseling and education that provides practical tips to select wisely from the available food and to restrict certain foods may help improve adherence.
- Duration of diabetes and complications - Long duration and appearance of complications tend to break the patients resolve and requires reinforcement and encouragement.

**HCP Related (Table 3)**

- Role of good professional advice cannot but be overemphasized, the most important discriminator between those who followed diet advice and those who did not, were related to who gave advice.
- Reinforcement and encouragement are important discriminators. (Fig. 2 – How often have you visited the dietician)
- Quality of advice in the form of providing useful practical information, which is understandable and empowering to make decisions and healthy choices. (Fig. 3 – Were you told about; Fig. 4: Problem

**Table 2 : Patient characteristics differentiating features**

	Group 1 (DFPD)	Group 2 (DFPD)	Group 3 (DNFD)
Socioeconomic status			High
Sex			Male
Age		Older	Younger
Health conscious	More	Less	Less
Family type	Nuclear		
Family support	Good	Less	
Diabetes duration	Short	Longer	
Complications	Less	More	
Insulin therapy		More likely	

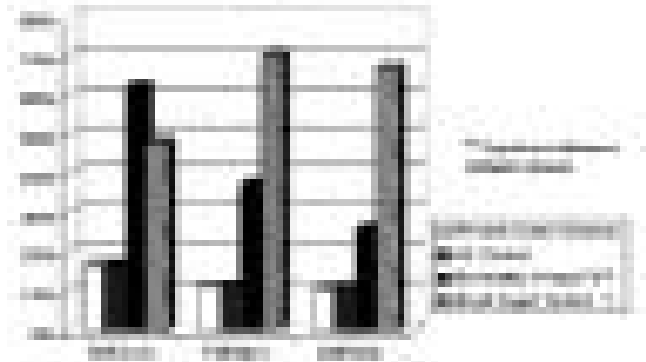


Fig. 1 : Why is diet control important for you?

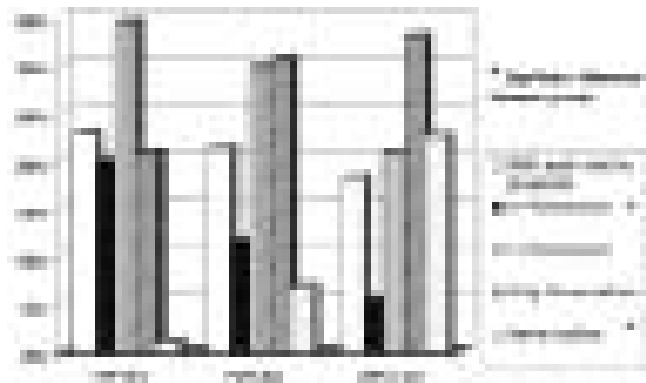


Fig. 2 : How often have you visited a dietician since diagnosis?

understanding advice)

- Linking diet advice to overall health promotion not merely to blood glucose control was also an important discriminator.

**Group 1**

Patients in group 1 were older than those who did not follow advice, and had diabetes for shorter duration. They

**Table 3 : Health professional characteristics differentiating features**

	Group 1 (DFPD)	Group 2 (DFPD)	Group 3 (DNFD)
Advice given by dietician	Most likely	Likely	Less likely
Visit dietician	More often	Less often	Less often
Advice includes overall health promotion not merely blood sugar control	More likely	Less likely	Less likely
Advice includes healthy options, cooking methods, practical tips to deal with day to day lifestyle issues	More likely	Less likely	Less likely
Reinforcement of advice	More likely	Less likely	Less likely

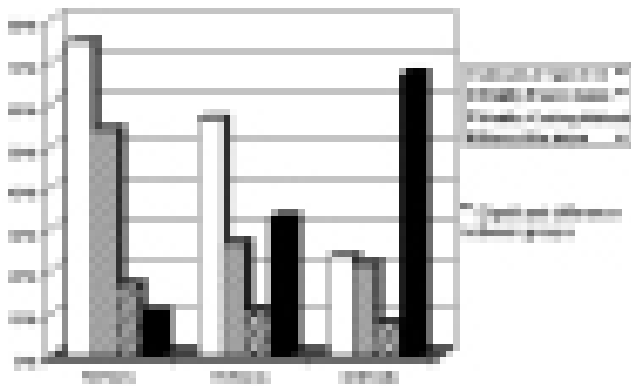


Fig. 3 : Were you told about?

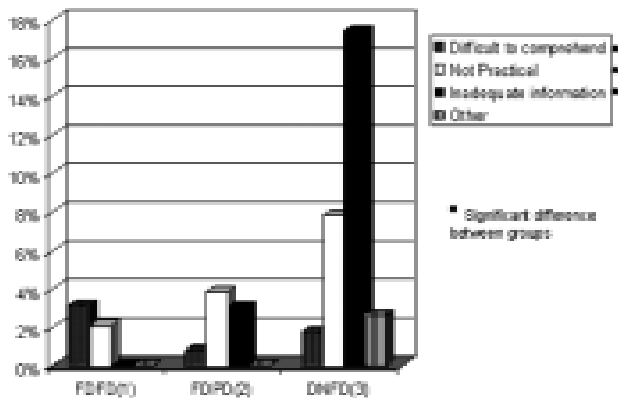


Fig. 4 : Problems understanding diet advice?

had fewer late complications, were more aware that proper diet was important for being fit and healthy, and belonged to nuclear family. They had good family support, but probably had a less busy work life. They were more likely to have received advice from a dietician and visited dieticians more often. The advice received focused on elements to promote overall health not merely on control of blood sugar. They were more likely to have been given other forms of advice, apart from printed diet charts. They were also more likely to have received advice on healthy food options, cooking methods, practical guidance to deal with lifestyle issues. The advice was reinforced during repeat visits. As a group they came across as having received adequate information and more practical advice. They felt empowered, and were thus more likely to impose self restriction and control; and make and sustain behavior change. They perceived that they had reached their desired goals and felt satisfied with treatment outcome.

#### Group 2

Patients in group 2 FDPD (Followed for partial duration) had diabetes for longer duration, had more complications, more likely to be on insulin often in combination with OAD. The family support seemed less (more likely to have separately cooked food which was not shared by others in the family – indicating isolation at meal time), or they were elderly dependent. They had visited the dietician less often, fewer amongst them considered that proper diet played a

role in being fit and healthy, their focus on diet was mainly in relation to blood sugar control, and other elements to promote health were neglected despite higher prevalence of complications. They were also less likely to understand their diet, sought more information on diet, felt the advice was impractical, and fewer amongst them had received advice on healthy food options, cooking methods, practical guidance to deal with lifestyle issues. Most likely many in this group had probably started taking dietary advice seriously lately because of associated complications and added insulin therapy, others in the group may have given up after initially following it for a few years.

#### Group 3

Patients in Group 3 DNFD (Did not follow diet) were more likely to be male, younger in age, perhaps indicative of a busy work life. They were less likely to have received advice from a dietician, and had visited dietician less often. They were less likely to perceive the link between diet and being healthy or fit and were more likely to link it to controlling blood sugar, their health care professionals (HCPs) were less likely to have indicated the positive link between advised diet and being healthy and fit. They had often received printed diet charts, and were less likely to have been given advice on healthy food options, cooking methods, practical guidance to deal with lifestyle issues. Because of fewer visits, diet advice was less likely to have been reinforced or modified to suit needs. These patients were more likely to have problem understanding their diet, sought more information, felt the advice was impractical, too rigid and did not suit their life style. (Fig. 5- Problem implementing advice) They did not feel empowered, and were thus less likely to impose self restrictions or make behavior change. They were at the same time aware and more likely to perceive that desired goals had not been reached. (Fig. 6 – Did you achieve desired goals)

### DISCUSSION

Although poor glycemic control has often been attributed to patients' noncompliance with prescribed diets or medications<sup>1</sup> or to limited access to care,<sup>2</sup> few studies have focused on the effect of provider decision making on diabetes management and on the reasons why providers may fail to intensify therapy in poorly controlled patients.<sup>3</sup>

A survey in Kerala<sup>4</sup> showed that majority of the patients did not have enough knowledge about the local diets and they attribute it to shortage of dietary advisors at the clinics. There was also lack of proper knowledge of diet therapy amongst the physicians. The physician fails to understand the life style of his patients and the need for tailor made diet prescription instead of the common diet sheet. Though one to one discussion with the patients is the best; only 1/3 rd find time for it. The maximum time spent with one patient is only ten minutes. In majority of diabetic clinics dietary advice is given only on the first visit and later only if blood sugar is out of control. The other problem is the language

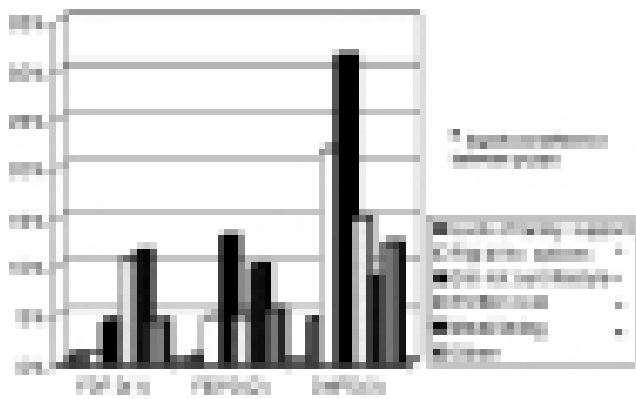


Fig. 5 : Problems implementing advice

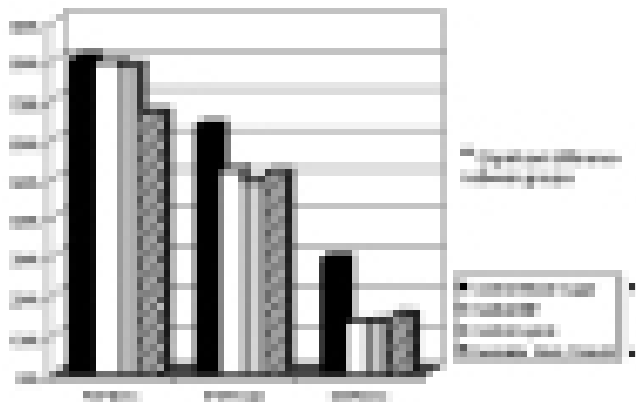


Fig. 6 : Did you achieve desired goals?

used by physician and dietitians. Many patients were unable to grasp the concept of measuring caloric contents. In this survey it was found that majority of patients believe that once the drug or insulin is started, there is little use of dietary restriction.

In a study done in Pondicherry, the knowledge, attitude and self care regarding diabetes was assessed, most of the patients appreciated the need for dietary care or medication, but only 50 per cent regulated their diet. None of the patients had any formal education regarding diabetes.<sup>5</sup> Planning a realistic diet and exercise program was favored as a solution for the lack of motivation and will power. It was rated as most effective, easiest to apply, and most likely to be used. Setting goals one week at a time was judged the best way to respond to poor or slow results (68 percent).

Susan Borra reported that consumers are motivated by two potentially conflicting needs - clear information that propels them to take action and for the power to make their own choices.<sup>6</sup>

Comparison with a study by Terri Travis on patient perception of factors that affect adherence to diet found many similarities.<sup>7</sup> The most common similarity found from the results was that patients who visited the dietician more often and had more follow-ups were better able to adhere to the diet than those who visited the dieticians less often and did not have follow-up sessions. In our study we

were also able to see that those who visited the dieticians were better able to adhere to the diet than those who had merely been advised by the physicians. Another similarity between the two studies was the importance of information and knowledge on diet in affecting a change in the dietary behaviour of the patient. In the Travis study, it was seen that 'knowledge of what foods to buy' had a positive effect on adhering to the dietary regimen; while in the multi-centre study in South India, inadequate information on diet was seen as a barrier to changing dietary behaviour.

The present study clearly shows that many factors determine outcomes of dietary advice, both patient and health care provider related. While patient related factors maybe difficult to change, understanding the patient's situation and needs is important to provide simple, understandable and empowering advice. In our study, patients that followed diet advice were more likely to have received advice from a dietician and had visited a dietician more often. The advice focused on elements to promote overall health not merely control of blood sugar. They were more likely to have been given other forms of advice, apart from printed diet charts. They were also more likely to have received advice on healthy food options, cooking methods, practical guidance to deal with lifestyle issues. The advice was reinforced during repeat visits. As a group they came across as having received adequate information and more practical advice. They felt empowered, and were thus more likely to impose self restriction and control; and make and sustain behavior change.

A study reported from Finland showed patients' readiness for dietary change at the beginning of counseling. It was noticed that the stages of change varied in different dietary areas and within certain dietary habits. These stages of change may involve overall dietary behavior or some minor aspects of their diets. Understanding patient-specific stages of change help counselors use the most appropriate strategies.<sup>8</sup>

The trans-theoretical, or stages-of-change, model has been used to describe stages in people's readiness to alter current behavior. The stages-of-change model characterizes increasing willingness to make substantial lifestyle modifications, ranging from pre-contemplation and contemplation to preparation, action, and maintenance stages, and is more fully described elsewhere.<sup>9</sup>

In a study conducted to study readiness to change in patients and their clinical success. It was seen that patients who stated that they were ready to begin to change their diabetes-related behavior now (action stage) or within 1 month (preparation stage) reduced their baseline hemoglobin A<sub>1c</sub> levels more quickly and to a greater degree than patients who were willing to change their diabetes management in 6 months (contemplation stage) or who did not want to change their diabetes management (pre-contemplation stage).<sup>10</sup>

According to Marion Franz, Medical Nutrition therapy does not fail—traditional dietary advice, handing patients

preprinted "diet sheets," treatment protocols, and even the pancreas can fail.<sup>11</sup>

While prescribing diet and handing out diet charts is simple, it should not be construed that this will make a material change in behavior or compliance. In the DAWN study,<sup>12</sup> data from India indicates that patient self admitted compliance to diet advice is only 20%. If we have to make a material difference, our approach should change from transactional to that of a team based on mutual respect and trust. The advice must be simple, comprehensible, enabling and empowering. We must target elements that the person is most willing to change and build on successes to bring about more and lasting behavior changes. When behaviors and beliefs have to be changed we must remember that there is a complex interaction between current beliefs and situation, change preparedness and information and action required to achieve a new state of behavior. The care provider must understand this and mould their advice to ensure maximum impact.

#### Acknowledgement

The authors wish to acknowledge the help of the staff members of the institutions in which the survey was carried out. The authors also wish to place on record the help provided by Ms. Kavitha Bekkam with the statistical work.

#### REFERENCES

1. UK Prospective Diabetes Study 7: response of fasting plasma glucose to diet therapy in newly presenting type II diabetic patients, UKPDS Group. *Metabolism* 1990;39:905-12.
2. UK Prospective Diabetes Study Group (UKPDS 37). Quality of life in type 2 diabetic patients is affected by complications but not by intensive policies to improve blood glucose or blood pressure control. *Diabetes Care* 1999;22:1125-36.
3. El-Kebbi IM, Ziemer DC, Gallina DL, Dunbar V, Phillips LS, Diabetes in urban African-Americans. XV. Identification of barriers to provider adherence to management protocols. *Diabetes Care* 1999;22:1617-20.
4. Jayakumar RV. Nutritional Guidelines in Diabetes - Limitations and Barriers, Proceedings of the 6<sup>th</sup> Novo Nordisk. *Diabetes Update* 1997;35-37.
5. Gopalan R, Srinivasa DK, Dasgupta B. Perceptions & practices of diabetics in Pondicherry. *Indian J Med Res* 1991;94:30-35.
6. Borra S, Kelly L, Tuttle M, Neville K. Developing actionable dietary guidance messages: dietary fat as a case study. *J Am Diet Assoc* 2001;101:678-84.
7. Travis T. Patient perception of factors that affect adherence to dietary regimens for diabetes mellitus. *The Diabetes Educ* 1997;23:152-56.
8. Kasila K, Poskiparta M, Karhila P, Kettunen T. Patients' readiness for dietary change at the beginning of counselling: a transtheoretical model-based assessment. *J Hum Nutr Diet* 2003;16:159-66.
9. Prochaska JO, DiClemente CC, Norcross JC. In search of how people change. Applications to addictive behaviors. *Am Psychol* 1992;47:1102-14.
10. Kevin A. Peterson, Marsha Hughes, Readiness to Change and Clinical Success in a Diabetes Educational Program. *J Am Board Fam Pract* 2002;15:266-71.
11. Marion J Franz, Joyce Green Pastors, Hope Warshaw, and Anne E Daly. Does "Diet" Fail? *Clinical Diabetes* 2000;18: 162-74.
12. Peyrot M, Rubin RR, Lauritzen T, Snoek FJ, Matthews DR, Skovlund SE. Psychosocial problems and barriers to improved diabetes management: results of the Cross-National Diabetes Attitudes, Wishes and Needs (DAWN) Study. *Diabet Med* 2005;22:1379-85.

### DOCTOR 2007 Medical Software

NEW YEAR OFFER : USB STORAGE DRIVE FREE (offer valid till Feb 29, 2008)

CLINICAL : Case sheets, speciality sheets, Inpatient, ICU, Lab, PDR, Auto Casesummary, Certificates, letters, USS, X-ray, Pathology, Endoscopy, Echo, Proc. reports, very little typing needed. Prescription Autodose, Allergy, disease-contraindication, interaction alert, Fonts option (Hindi, Tamil etc) Overdose treatment, Ther. level, dose in organ failures Store Recall at a single click.

ADMINISTRATIVE : Appointment scheduler; OP Card, Pt. List, Statistics, Finance billing; salary, room, manpower management; Drugstore, Inventory. Secure, NETWORK ready. Auto backup Store/Link photos, X-ray, ECG, Videos; Change Header/Footer; Diet advisor-autocalory calculator

EDUCATIVE : Disease guidelines Medical graphs; Patient education videos and printouts. Reliable. Saves Life, Time and Money. Hospital pack, and excl. medicine, surgery, OBG, clinic packs available.

Address : MEDISOFT, Achutha Warriar Lane, Cochin-682035. <http://www.medisoftindia.com>

E-mail : [www.medisoftindia@gmail.com](mailto:www.medisoftindia@gmail.com)

Ph 09847294414

© IPR.All Rights Reserved