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Original Research Article

Effect of Self Care on Glycemic Control among Males and Females in Rural Kerala

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ABSTRACT

This study highlighted the poor self-care activities of female Diabetes patients in a rural area of Kerala. In spite of high female literacy rates and other indicators of socio economic progress in the state of Kerala, this aspect of diabetes care remained poor. Poor self-care resulted in poor blood sugar control, leading to early onset of diabetes complications and consequent poor quality of life of female diabetes patients. This may partly be due to the patriarchal nature of society. The poor self-care activities of the females could also be attributed to behaviour conditioned by gender relations prevalent in the society. Women seem to assimilate or internalize the patriarchal subjectivity of the society. The comparative study revealed that irrespective of religion, the self-care regimen of all females remained low. The study points to a gender perspective in formulation of National health policies with Gender Equity and Gender Mainstreaming assuming great significance in achievement of all goals, globally.

Key Words: Self-care, female diabetes patients, Patriarchal society, Kerala, Health policy formulation

INTRODUCTION

Non Communicable diseases like Diabetes are rapidly becoming a major public health threat in Asian countries, Particularly India. Non-communicable Diseases (NCDs) kill 41 million people each year, equivalent to 71% of all deaths globally. [1] Over 85% of these "premature" deaths occur in low- and middle-income countries and between the ages of 30 and 69 years. [1] NCD impedes progress towards WHO 2030 Agenda for Sustainable development that targets reducing premature deaths by one third. India is rightly called the diabetes capital of the World as major proportion of the World's Diabetic patients is in India. The Diabetes Atlas, 2006 published by the International Diabetes Federation, expects the number of people with Diabetes (20-79 age group) in India to increase to 69.9 million by 2025from 40.9 million in 2007. [2] Diabetes is the name of a condition where the blood sugar level consistently runs too high. In the previous generation, diabetes remained a disease of the affluent. The present scenario has changed dramatically. The disease has trickled down to the lowest strata of the society and has spread its tentacles far and wide.

The statistics of diabetes is quite alarming. The WHO estimates that 180 million people worldwide are affected by diabetes. This figure is expected to double by 2030 [3] i.e.7.7% of the global population. Diabetes is projected to affect Indians most among all others in the World by 2025. [4] Over the next 20 years, the developed World will see an increase of 20% in the number of adults living with Diabetes and developing countries will see an increase of 69% (Shaw et al, 2010). It is said that then every fifth diabetic subject in the world would be an Indian. [5]

According to one study conducted in India, Kerala stands number one in prevalence of

diabetes i.e. 20% - more than double the national average of 8%. [6] The crude prevalence of diabetes among 322 adults in an urban settlement in Central Kerala was found to be 16.3 percent[7].The crude prevalence rate of diabetes among urban residents was 12.7 per cent compared to 2.7 percent among coastal residents. [7] The Amritha Diabetes and Endocrine Population Survey [8] identified 9 percent reported prevalence and 10.5 percent prevalence of newly detected diabetes among semi-urban and urban adult resident in central Kerala. [9] This rapidly changing scenario in Kerala may be due to socio-economic transition occurring in rural areas also. Environmental and life style changes resulting from industrialization and migration to urban environment from rural settings may be responsible for the increasing incidence of diabetes to a large extent.

Diabetes is manifested as three different forms: type 1 diabetes, which is recognized as an auto-immune condition affecting people in childhood and early adulthood; Gestational diabetes, affecting women during pregnancy; and type 2 diabetes or T2DM closely linked to environmental factors and affecting mostly adults. Type 2 diabetes has two main characteristics: (i) increased insulin resistance; and (ii) failure of compensatory insulin secretion due to beta cell failure or dysfunction. Majority of the cases of Diabetes are of type 2 diabetes.

Diabetes is known as a silent killer as it targets important organs after years of onset exhibiting no symptoms until the damage has occurred. Hence early detection, active treatment and maintaining adequate glycemic control is essential to keep complications of the disease at bay.

The disease leads to microvascular (diabetic nephropathy, neuropathy and retinopathy) and macrovascular (coronary artery disease, peripheral vascular disease and stroke) problems, thus substantially jeopardizing the quality of life of the people with diabetes. [10]

W.H.O. defines Self-care as the ability of individuals, families and communities to promote health, prevent disease, maintain health and cope with illness and disability with or without the support of a health-care provider. [11] The W.H.O. fact file on NCDs states that Healthy diet, regular physical activity and maintaining a normal body weight (self-care) are ways to prevent or delay the onset of type 2 Diabetes or its complications. Self-care orSelf-efficacy plays a central role in adequate glycemic control. [12] Bandura explains that self-efficacy is a focal determinant because it affects health behaviour both directly and by its influence on the other determinants. Efficacy beliefs influence goals and aspirations. The stronger the perceived self-efficacy, the higher the goals people set for themselves and the firmer their commitment to them. [12]

Diabetes self-management is a demanding and life long process involving cognitive skills in order to achieve optimum glycemic control. To optimize diabetes outcomes, the individual needs to possess knowledge, [13] cognitive skills focusing on self-assessment, problem solving, informed decision making, psychomotor skills to perform specific tasks [14] and belief in one's own capabilities to perform a certain set of tasks leading to well-being. [15]

Ultimately, when the individual incorporates diabetes self-care in daily living, thoroughly and successfully, he/she is more likely to attain glycemic control which, in return, delays, or prevents the occurrence of diabetes complications. [16,17]

Researchers and major diabetes organizations such as the American Diabetes Association and other National groups recommend glycosylated haemoglobin (A1C) as an objective measure of patient self-care. [18,19] According to the ADA guidelines, [20] A1C level should be less that 7%, pre-prandial capillary plasma glucose of 90-130 mg/dl (5.0-7.2 mmol/L) and peak postprandial capillary plasma glucose, less than 180 mg/dl (< 10.0

mmol/L) (ADA, 2007) in order to achieve glycemic control in patients with diabetes. On the other hand, the American Association for Clinical Endocrinologists (AACE) are more aggressive on glycemic control and recommends for A1C of 6.5% or less.

At present, A1C is considered the best index of metabolic control in individuals with diabetes. [21] The Diabetes Control and Complications Trial [22] and the UK Prospective Diabetes Study [23] (UKPDS) have demonstrated that lowering A1C can reduce the risk of diabetes micro vascular complications.

Thus Self-care in diabetes is the corner stone in achieving good glycemic control (blood sugar control), thereby preventing the onset of Diabetes complications which increases the Morbidity and Mortality of the disease and adds to the disease burden of a nation.

This study was undertaken to understand the effect of Self-care on HbA1C (blood sugar control) among Males and Females with Type -2 Diabetes in a Rural Population in Kerala. The study tries to draw out the differences in Self-care among Males and Females taking into consideration the Patriarchal nature of the society and to understand the Gender differences in approaches to self-care. Gender refers to "the array of socially constructed roles and relationships, personality traits, attitudes, behaviors, values, relative power and influence that society ascribes to the two sexes on a differential basis." [24] With Gender equity, gender equality and gender mainstreaming assuming significance in National and international Health policies and programmes, this study attempts to highlight the poor self-care among the female diabetes patients in a rural area of Kerala. In spite of the high literacy rates, accessible and adequate health facilities and economic prosperity of the study area, this aspect in Diabetes care among females remains poor. Thus sex based differences should be considered when developing awareness and treatment programs for people with Diabetes.

MATERIALS AND METHODS

A descriptive and analytical methodology is adopted in the study. The study was conducted in a diabetes treatment Centre in rural Kerala. A cross sectional study was conducted in a stratified random sample of diabetes patients belonging to the three religious groups found in the rural study area of Kottayam district. The sample in the study was stratified on the basis of religion mainly to facilitate comparisons. Based on pilot study, a sample of 300 is chosen with 138 males and 162 females. The recruited patients were adults above 40 years of age already diagnosed with T2DM (Type 2 Diabetes Mellitus) and were on anti-diabetic drugs. Adult onset diabetes (T2DM) is diabetes that occurs after the age of 18. The cut off age was fixed as 40 as diabetic complications usually get manifested after 10 years of onset. This age group was selected to highlight the importance of self-care in maintaining absolute blood sugar control.

A combination of interview (face to face) and self-completion of questionnaire is adopted for the data collection. For part 1 of the questionnaire, demographic details were entered by the researcher and the medical records were accessed to record the relevant details like height, weight, A1C, B.M.I., F.B.S. and chronic conditions of the patients. The self-care activities of the patients were assessed with the SDSCAS[25] (Summary of diabetes self-care activity scale). It consists a core set of 12 questions to assess the dietary habits, exercise regimen, blood sugar testing, foot care and smoking status for the past 7 days.

The revised version of the original version of SDSCA is employed in the study. It consists of a core set of 12 items that have all been used in previous studies in addition to questions on foot care and smoking. The version does not include questions on medication taking because of

strong ceiling effects and a lack of variability among respondents contributing to lowered test retest reliability for these items in spite of the moderate-to-high validity of the specific diet scale. The second version of SDSCA resulted after undergoing subsequent revision following 7 studies (5 randomized interventions and 2 observational studies). The average inter-item correlations resulted in 0.47, whereby the specific diet item resulted in moderate test-retest correlation (mean= 0.4). Criterion validity of the diet and exercise subscales (mean = 0.23) was supported by developing correlations with other measures of diet and exercise Based on the psychometric properties, the revised scales included two new subscales on smoking and foot care. This version of the tool was adopted in the study as it is assumed to give a clear picture of the self-care activities of the study population.

These questions also provided an insight for the patients to evaluate their self-care regimen as it asked them to recollect their dietary habits, exercise regimen, blood sugar testing, foot care and smoking status for the past 7 days.

Validity and reliability of SDSCA was established by the authors themselves. Content validity was established since the inception of SDSCA by Schafer and colleagues. In addition, Focus group discussions were also conducted among diabetes patients to elicit any additional information regarding self-care.

STATISTICAL ANALYSIS

The data was analyzed using statistical package for the social science (version 19). The test statistics used for the purpose of data analysis were descriptive statistics like mean, S.D., median and percentages. Independent sample t-test was used to compare the self-care activities of males and females based on HbA1C values. Chi-square test was used to compare selected demographic variables based on Religion. All statistically significant results were based on a $p<0.05$ level.

RESULTS

Sample Characteristics

DEMOGRAPHIC CHARACTERISTICS

AGE

The majority of the patients were in the age group of 60-69 (n=103; 34.3%) followed by 50-59 (n=86; 28.7%) and more than 70 years (n=69; 23%).42 (14%) participants were in the age group of 40-49. Table 1 summarizes the respondents age.

Table 1: Age distribution

AGE GROUP	FREQUENCY	PERCENT
40-49	42	14
50-59	86	28.7
60-69	103	34.3
70& ABOVE	69	23
TOTAL	300	100

SEX

The gender was unevenly distributed with the majority of the respondents being females. Of the 300 respondents, there were 168 females (54%) and 132 males (46%).

EDUCATIONAL STATUS

The educational status was measured with categories such as “upto std. 10th”, “Graduate”, “Post Graduate” and “Professional”. Majority of the sample only had basic education (n=192; 64%).Graduates include 21.3% (n=64), Post-graduates (n=29, 9.7%) and Professionals form 5 %(n=15).

ANNUAL INCOME

The annual income was categorized into “less than Rs. 48000”, between “48000-450000”, “450000-100000” and above 100000. Major part of the respondents (n=124; 41.3%) belonged to the middle income group. Only 16.3% (n=40) were below the poverty line. The cumulative frequency of the population above poverty line is 83.7%

PHYSIOLOGIC CHARACTERISTICS OF THE SAMPLE

B.M.I.

The B.M.I. or Body mass index categorizes the sample into normal weight, overweight, obese and extremely obese. Only 36% of the sample had normal

weight. The rest 64% were either overweight or obese. B.M.I is calculated by dividing weight in kilograms by square of height in meters. Obesity is one of the risk factors in type 2 diabetes. The mean B.M.I. is 27.31 (S.D. =3.72) ranging between 19.95-34.81.

HbA1C

The mean A1C of the sample is 8.8 (S.D=1.7) ranging from a minimum of 5.4 to a maximum of 14. The A1C was retrieved from the patient's medical records and is the last examined value (within past 3 months).Values ranging between 6-7 is taken as controlled diabetes and above 7 is considered uncontrolled diabetes. Values within 6 denote normal blood glucose levels.

Diabetes education

The entire sample received some form of diabetes education. 8.3% (n=6) received from health campaigns, books, periodicals and other visual media, the rest (91.7%, n=294) as part of hospital counselling and education programme.

Characteristics of the scales used in the study

Summary of diabetes self-care activity scale

In keeping with the scoring guidelines of the original SDSCAS, the following mean scores were obtained for each subscale by averaging the standard scores (Score of the General Diet, Score of the specific Diet, Score of the exercise, score of blood sugar testing, score of foot care and score of medication adherence). The authors of the instrument [25] justified that this computation will give equal weight to each item of the different subscales, regardless of the number of items present.

The first two questions in the scale relates to adherence to the recommended eating plan in the past 7 days such that zero means the dietary regimen was not followed in the past week and a score of seven means that healthy dietary regimen was followed all seven days of the week the second subscale assessed specific dietary questions related to fruit and vegetables consumption and full fat dietary products and red meat consumed in the past week, whereby the responses on the latter item reflected inadequate adherence to a low-fat diabetes regimen. While doing data entry, the full fat dietary products' consumption was reverse coded, then scored accordingly.

Table 2: Table Comparison of HBA1C based self-care activity for males and females

			Mean	SD	N	T	P
General diet	Male	Poor	9.2	1.7	55	6.62**	0.000
		Good	7.7	1.1	83		
	Female	Poor	9.1	2.0	85	6.14**	0.000
		Good	7.5	1.2	77		
Specific diet	Male	Poor	9.3	1.6	60	8.35**	0.000
		Good	7.5	1.0	78		
	Female	Poor	9.0	1.9	96	6.29**	0.000
		Good	7.4	1.1	66		
Dietaryadherance	Male	Poor	9.2	1.6	68	8.63**	0.000
		Good	7.4	0.9	70		
	Female	Poor	9.0	1.8	101		
		Good	7.2	1.0	61	7.12**	0.000
Exercise	Male	Poor	8.3	1.7	77	0.48	0.629
		Good	8.2	1.4	61		
	Female	Poor	8.5	1.8	117	2.15*	0.033
		Good	7.9	1.6	45		
Foot care	Male	Poor	8.3	1.6	94	0.06	0.954
		Good	8.3	1.5	44		
	Female	Poor	8.6	1.8	111	2.8**	0.006
		Good	7.8	1.8	51		
Smoking status	Male	Poor	8.2	1.7	72	0.59	0.554
		Good	8.4	1.4	66		
	Female	Poor	8.3	1.8	159	0.35	0.729
		Good	8.7	1.8	3		

**: - Significant at 0.01 level, *: - Significant at 0.05 level

The independent sample t-test is highly significant at 0.01 level with respect to general diet, specific diet, dietary adherence and podiatric care. The t-test again shows significance at 0.05 level with respect to physical activities on comparison. The above table clearly indicates the poor self-care activities of females. As stated earlier, poor self-care results in poor glycemic control that is reflected in the HbA1C values. Values ranging between 6-7 are taken as controlled diabetes and above 7 are considered uncontrolled diabetes. With respect to the general diet, there was more number of female (85) with poor blood sugar levels than males (55). Specific diet (consumption of fruits and vegetables) also revealed poor consumption by females resulting in 96 of them with uncontrolled diabetes whereas there were only 60 males with poor glycemic control. The General dietary adherence control (full fat dairy products and red meat) too were not followed by the females resulting in 101 females having poor glycemic control compared to 60 males with poor blood sugar control. Physical inactivity of females resulted in 117 of them with poor blood sugar control compared with77 males with less control.111 females ignored podiatric care resulting in high HbA1C when compared to males (94) with poor blood sugar control.

Table 3:Comparison of selected demographic variables based on religion

Demographic variables		Christian	Hindu	Muslim	χ^2	P
Age	40-49	17 (11.3)	11 (14.7)	14 (18.7)	18.11**	0.006
	50-59	38 (25.3)	15 (20)	33 (44)		
	60-69	55 (36.7)	31 (41.3)	17 (22.7)		
	70 and above	40 (26.7)	18 (24)	11 (14.7)		
Sex	Male	70 (46.7)	41 (54.7)	27 (36)	5.31	0.070
	Female	80 (53.3)	34 (45.3)	48 (64)		
Education	Upto SSLC	71 (47.3)	62 (82.7)	59 (78.7)	36.77**	0.000
	Graduate	46 (30.7)	9 (12)	9 (12)		
	PG / Professional	33 (22)	4 (5.3)	7 (9.3)		
Income	Upto 48000	18 (12)	24 (32)	7 (9.3)	52.65**	0.000
	48001-450000	44 (29.3)	38 (50.7)	42 (56)		
	450001-1000000	34 (22.7)	8 (10.7)	16 (21.3)		
	Above 1000000	54 (36)	5 (6.7)	10 (13.3)		

**: - Significant at 0.01 level

Demographic variables like age, education and income of the diabetes patients vary among the three religious groups. Maximum number of elderly patients patients (70 years and above) are found among Christians. So also, with regard to education, there are more educated people among the Christians. Christians are the higher income group when compared to Hindus and Muslims in the study area.

On comparing the self-care activities,SDSCA Index does not vary between the patients belonging to the three religious groups.

Table 4: COMPARISON OF UNCONTROLLED GLYCEMIC CONTROL (HbA1C) BASED ON RELIGION

HbA1C Sex		Religion			Total
		Syrian Christian	Hindu	Muslim	
8-10	Male	34	15	14	63
	Female	40	17	27	84
	Total	74	32	41	147
more than 10	Male	5	4	4	13
	Female	7	6	8	21
	Total	12	10	12	34

The above table shows the poor self-care of female patients irrespective of religion. In both the groups with uncontrolled diabetes (HbA1C8- 10 &> 10), the females had poor glycemic control. Poor Glycemic control is due to poor self-care.

CONCLUSIONS

The self-care activities varied greatly between males and females. The self-care activities of the females were very poor when compared with the males. The poor self-care activities of the females could be attributed to behaviour conditioned by gender relations prevalent in the society. Women seem to assimilate or internalize the patriarchal subjectivity of the society. But this is a feature of most households not only in the study area but of the country as a whole. The phenomenon of subordination of women by men results in a distinction between roles of men and women and their separate assignment to domestic and public spheres. The degree of this subordination varies by geographical or cultural patterns and is more pronounced in developing countries like India.The spouses and children took centre stage in the lives of most female patients and little time could be spent on themselves either for exercise or preparation of a diabetic diet.This gender difference in self-care can be annihilated by stringent awareness and health education campaigns for the mitigation of negative health outcomes. NCD prevention strategies should include gender sensitive health promotion measures to achieve the WHO Global Strategy for the Prevention and Control of Non-communicable Diseases (NCD Action Plan). Gender Analysis in Health with respect to chronic diseases must be promoted in development of Health policy and Community Health services. Mainstreaming gender into treatment modalities by Physicians can also be advocated.

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