

THE URGENCY OF EVOLVING AND IMPLEMENTING A DIABETIC CARE EDUCATION CURRICULUM

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Abstract

Man is greatly concerned about the proper care of the body and healthy development of one's physique. "Be strong, my young friends" is a famous quote by Swami Vivekanand. Good health is a major resource and is an important dimension of the quality of life. Diabetes, the leading non communicable disease has emerged as major health care problem in India. Diabetes care and education is an essential component of diabetes management and is increasingly recognized as an integral part of chronic diseases management. Kerala has to undertake a massive lifestyle education programme. The major objective of the study is to find out urgency of preparation and implementation of a diabetic care education curriculum at the teacher education level. The sample take for this study is 60 teacher educators and 120 secondary school teachers from different institutions in Kottayam district. The major tool used is India Diabetic Risk Score (IDRS) developed by MDRF; Questionnaire on life style diseases and diabetic care education prepared by the investigator; and Documents of Government Medical College, Kottayam, etc. The study found that some teachers and teacher educators are already diabetic, some of them are at high risk, and many of them are at moderate risk. It shows the need and significance of a new area of study to be included as part of the general health and wellness programme at every level of education through designing and implementing an effective diabetic education curriculum.

Key words: *Diabetic Care Education, Teacher Education, Implementation, Evolve, Diabetes, Type I and Type II diabetes, etc.*

Introduction

Swami Vivekananda (1891) was also not satisfied with an education that merely looked to the development of the mind. He was also greatly concerned about the proper care of the body and healthy development of one's physique. "Be strong, my young friends", he urged. "That is my advice to you; you will be nearer to heaven through football than through the "Gita". These are bold words, but I have to say them to you, I know where the shoe pinches, you will understand the Gita better, with your biceps, your muscles a little stronger you will understand the mighty genius and the mighty strength of Krishna better with a little of strong blood in you.

In 1986, the Ottawa Charter for Health Promotion redefined health as the extent to which an individual or group is able to "realize aspirations and satisfy needs and to change or cope with the environment. Health is a resource for everyday life, not the objective of living. Health is a positive concept emphasizing social and personal resources, as well as physical capacities".

In keeping with the concept of health as a fundamental human right, the Ottawa Charter emphasizes certain prerequisites for health, which include peace, adequate economic resources, food and shelter, and a stable ecosystem and sustainable use of resources. Recognition of these prerequisites highlights the inextricable links between social and economic conditions, the physical environment, individual lifestyles and health, and that all people should have access to basic resources for health. These links provide the key to a holistic understanding of health. As such, a comprehensive understanding of health implies that all systems and structures which govern

social and economic conditions and the physical environment should take account of the implications of their activities in relation to their impact on individual and collective health and well being.

Diabetes, the leading non communicable disease has emerged as major health care problem in India. According to the Diabetes Atlas published by the International Diabetes Federation (IDF), there are an estimated 40 million persons with diabetes in India in 2007 and this number is predicted to rise to almost 70 million people by 2025, by which time every fifth diabetic subject in the world would be an Indian. Indians are more prone to develop diabetes and its complications at younger age. Consequently burden of uncontrolled diabetes in India is high with more than two third of the treated patients, not achieving optimal glycemic target.

Diabetes education has been an essential component of diabetes management since 1930 and is increasingly recognized as an integral part of chronic diseases management, The objective of educating people with diabetes are to optimise metabolic control; prevent acute and chronic complications; improve quality of life by influencing patient behaviour and produce changes in knowledge, attitude and behaviour that is necessary to maintain and improve our health.

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Diabetes and Diabetes Care

Diabetes mellitus (DM) is a set of related diseases in which the body cannot regulate the amount of sugar (specifically, glucose) in the blood. The blood delivers glucose to provide the body with energy to perform all of a person's daily activities.

- The liver converts the food a person eats into glucose. The glucose is then released into the bloodstream.
- In a healthy person, the blood glucose level is regulated by several hormones, primarily insulin. Insulin is produced by the pancreas, a small organ between the stomach and liver. The pancreas also makes other important enzymes released directly into the gut that helps digest food.
- Insulin allows glucose to move out of the blood into cells throughout the body where it is used for fuel.
- People with diabetes either do not produce enough insulin (type 1 diabetes) or cannot use insulin properly (type 2 diabetes), or both (which occurs with several forms of diabetes).
- In diabetes, glucose in the blood cannot move efficiently into cells, so blood glucose levels remain high. This not only starves all the cells that need the glucose for fuel, but also harms certain organs and tissues exposed to the high glucose levels.

I. Type 1 Diabetes (T1D):

The body stops producing insulin or produces too little insulin to regulate blood glucose level.

- Type 1 diabetes involves about 10% of all people with diabetes in our country.
- Type 1 diabetes is typically diagnosed during childhood or adolescence. It used to be referred to as juvenile-onset diabetes or insulin-dependent diabetes mellitus.
- Type 1 diabetes can occur in an older individual due to destruction of the pancreas by alcohol, disease, or removal by surgery. It also results from progressive failure of the pancreatic beta cells, the only cell type that produces significant amounts of insulin.
- People with type 1 diabetes require insulin treatment daily to sustain life.

Causes

Type 1 diabetes is believed to be an autoimmune disease. The body's immune system specifically attacks the cells in the pancreas that produce insulin.

- A predisposition to develop type 1 diabetes may run in families, but genetic causes (a positive family history) are much more common for type 2 diabetes.

- Environmental factors, including common unavoidable viral infections, may also contribute to type 1 diabetes.
- Type 1 diabetes is most common in people of non-Hispanic, Northern European descent (especially Finland and Sardinia), followed by African Americans, and Hispanic Americans. It is relatively rare in those of Asian descent.
- Type 1 diabetes is slightly more common in men than in women.

II. Type 2 diabetes (T2D)

Although the pancreas still secretes insulin, the body of someone with type 2 diabetes is partially or completely unable to use this insulin. This is sometimes referred to as insulin resistance. The pancreas tries to overcome this resistance by secreting more and more insulin. People with insulin resistance develop type 2 diabetes when they fail to secrete enough insulin to cope with their higher demands.

- At least 90% of adult individuals with diabetes have type 2 diabetes.
- Type 2 diabetes is typically diagnosed in adulthood, usually after age 45 years. It used to be called adult-onset diabetes mellitus, or non-insulin-dependent diabetes mellitus. These names are no longer used because type 2 diabetes does occur in younger people, and some people with type 2 diabetes require insulin therapy.
- Type 2 diabetes is usually controlled with diet, weight management, exercise, and oral medications. However, more than half of all people with type 2 diabetes require insulin to control their blood sugar levels at some point in the course of their illness.

Causes

Type 2 diabetes has strong genetic links, meaning that type 2 diabetes tends to run in families. Several genes have been identified, and more are under study which may relate to the causes of type 2 diabetes. Risk factors for developing type 2 diabetes include the following:

- High blood pressure
- High blood triglyceride (fat) levels
- Gestational diabetes or giving birth to a baby weighing more than 9 pounds
- High-fat diet
- High alcohol intake
- Sedentary lifestyle
- Obesity or being overweight
- Ethnicity, particularly when a close relative had type 2 diabetes or gestational diabetes: certain groups, such as African Americans, Native Americans, Hispanic Americans, and Japanese Americans, have a greater risk of developing type 2 diabetes than non-Hispanic whites.
- Aging: Increasing age is a significant risk factor for type 2 diabetes. Risk begins to rise significantly at about age 45 years, and rises considerably after age 65 years.

Common symptoms of both type 1 and type 2 diabetes

- *Fatigue, constantly tired:* In diabetes, the body is inefficient and sometimes unable to use glucose for fuel. The body switches over to metabolizing fat, partially or completely, as a fuel source. This process requires the body to use more energy. The end result is feeling fatigued or constantly tired.
- *Unexplained weight loss:* People with diabetes are unable to process many of the calories in the foods they eat. Thus, they may lose weight even though they eat an apparently appropriate or even an excessive amount of food. Losing sugar and water in the urine and the accompanying dehydration also contributes to weight loss.

- *Excessive thirst (polydipsia)*: A person with diabetes develops high blood sugar levels, which overwhelms the kidney's ability to reabsorb the sugar as the blood is filtered to make urine. Excessive urine is made as the kidney spills the excess sugar. The body tries to counteract this by sending a signal to the brain to dilute the blood, which translates into thirst. The body encourages more water consumption to dilute the high blood sugar back to normal levels and to compensate for the water lost by excessive urination.
- *Excessive urination (polyuria)*: Another way the body tries to rid the body of the extra sugar in the blood is to excrete it in the urine. This can also lead to dehydration because a large amount of water is necessary to excrete the sugar.
- *Excessive eating (polyphagia)*: If the body is able, it will secrete more insulin in order to try to manage the excessive blood sugar levels. Moreover, the body is resistant to the action of insulin in type 2 diabetes. One of the functions of insulin is to stimulate hunger. Therefore, higher insulin levels lead to increased hunger. Despite increased caloric intake, the person may gain very little weight and may even lose weight.
- *Poor wound healing*: High blood sugar levels prevent white blood cells, which are important in defending the body against bacteria and also in cleaning up dead tissue and cells, from functioning normally. When these cells do not function properly, wounds take much longer to heal and become infected more frequently. Long-standing diabetes also is associated with thickening of blood vessels, which prevents good circulation, including the delivery of enough oxygen and other nutrients to body tissues.
- *Infections*: Certain infections, such as frequent yeast infections of the genitals, skin infections, and frequent urinary tract infections, may result from suppression of the immune system by diabetes and by the presence of glucose in the tissues, which allow bacteria to grow. These infections can also be an indicator of poor blood sugar control in a person known to have diabetes.
- *Altered mental status*: Agitation, unexplained irritability, inattention, extreme lethargy, or confusion can all be signs of very high blood sugar, ketoacidosis, hyperosmolar hyperglycemia nonketotic syndrome, or hypoglycemia (low sugar). Thus, any of these merit the immediate attention of a medical professional.
- *Blurry vision*: Blurry vision is not specific for diabetes but is frequently present with high blood sugar levels.

All these will affect learning, study habits, enthusiasm and education in general. For effective learning and creative thinking, concentration, enthusiasm, dynamic nature of the young generation is a must. So an effective system of physical education with a core analysis of the present health conditions stressing the diabetes status is the need of the hour. Because, the diabetes problems are burning issues of the society, particularly of the young generation.

III. Gestational diabetes (GDM)

Gestational diabetes is a form of diabetes that occurs during the second half of pregnancy.

- Although gestational diabetes typically resolves after delivery of the baby, a woman who develops gestational diabetes is more likely than other women to develop type 2 diabetes later in life.
- Women with gestational diabetes are more likely to have large babies.

Metabolic syndrome

Metabolic syndrome, also referred to as syndrome X, is a set of abnormalities in which insulin-resistant diabetes (type 2 diabetes) is almost always present along with hypertension (high blood pressure), high fat levels in the blood (increased serum lipids, predominant elevation of LDL cholesterol, decreased HDL cholesterol, and elevated triglycerides), central obesity, and abnormalities in blood clotting and inflammatory responses. A high rate of cardiovascular disease is associated with metabolic syndrome.

Pre-diabetes

Prediabetes is a common condition related to diabetes. In people with prediabetes, the blood sugar level is higher than normal but not yet high enough to be considered diagnostic of diabetes.

- Prediabetes increases a person's risk of developing type 2 diabetes, heart disease, or stroke.
- Prediabetes can typically be reversed (without insulin or medication) with lifestyle changes such as losing a modest amount of weight and increasing physical activity levels. Weight loss can prevent, or at least delay, the onset of type 2 diabetes.
- An international expert committee of the American Diabetes Association redefined the criteria for prediabetes, lowering the blood sugar level cut-off point for prediabetes. Approximately 20% more adults are now believed to have this condition and may develop diabetes within 10 years if they do make lifestyle changes such as exercising more and maintaining a healthy weight.

About 17 million Americans (6.2% of adults in North America) are believed to have diabetes. It has been estimated that about one third of adults with diabetes do not know they have diabetes.

- About 1 million new cases of diabetes is diagnosed occur each year, and diabetes is the direct or indirect cause of at least 2,00,000 deaths each year.
- The incidence of diabetes is increasing rapidly. This increase is due to many factors, but the most significant are the increasing incidence of obesity associated with the prevalence of a sedentary lifestyle.

Complications of Diabetes

Both type 1 and type 2 diabetes ultimately lead to high blood sugar levels, a condition called hyperglycemia. Over a long period of time, hyperglycemia damages the retina of the eye, the blood vessels of the kidneys, the nerves, and other blood vessels.

- Damage to the retina from diabetes (diabetic retinopathy) is a leading cause of blindness.
- Damage to the kidneys from diabetes (diabetic nephropathy) is a leading cause of kidney failure.
- Damage to the nerves from diabetes (diabetic neuropathy) is a leading cause of foot wounds and ulcers, which frequently lead to foot and leg amputations.
- Damage to the nerves in the autonomic nervous system can lead to paralysis of the stomach (gastroparesis), chronic diarrhea, and an inability to control heart rate and blood pressure during postural changes.
- Diabetes accelerates atherosclerosis, (the formation of fatty plaques inside the arteries), which can lead to blockages or a clot (thrombus). Such changes can then lead to heart attack, stroke, and decreased circulation in the arms and legs (peripheral vascular disease).
- Diabetes predisposes people to elevated blood pressure, high levels of cholesterol and triglycerides. These conditions both independently and together with hyperglycemia, increase the risk of heart disease, kidney disease, and other blood vessel complications.

Diabetes can contribute to a number of acute (short-lived) medical problems.

- Many *infections* are associated with diabetes, and infections are frequently more dangerous in someone with diabetes because the body's normal ability to fight infections is impaired. To compound the problem, infections may worsen glucose control, which further delays recovery from infection.
- *Hypoglycemia* or low blood sugar occurs intermittently in most people with diabetes. It can result from taking too much diabetes medication or insulin (sometimes called an insulin reaction), missing a meal, exercising more than usual, drinking too much alcohol, or taking certain medications for other conditions. It is very important to recognize hypoglycemia and be prepared to treat it at all times. Headache, feeling dizzy, poor concentration, tremor of the hands, and sweating are common symptoms of hypoglycemia. A person can faint or have a seizure if blood sugar level becomes too low.

- *Diabetic ketoacidosis* (DKA) is a serious condition in which uncontrolled hyperglycemia (usually due to complete lack of insulin or a relative deficiency of insulin) over time creates a buildup of ketones (acidic waste products) in the blood. High levels of ketones can be very harmful. This typically happens to people with type 1 diabetes who do not have good blood glucose control. Diabetic ketoacidosis can be precipitated by infection, stress, trauma, missing medications like insulin, or medical emergencies such as a stroke and heart attack.
- *Hyperosmolar hyperglycemic nonketotic syndrome* is a serious condition in which the blood sugar level gets very high. The body tries to get rid of the excess blood sugar by eliminating it in the urine. This increases the amount of urine significantly, and often leads to dehydration so severe that it can cause seizures, coma, and even death. This syndrome typically occurs in people with type 2 diabetes who are not controlling their blood sugar levels, who have become dehydrated, or who have stress, injury, stroke, or are taking certain medications, like steroids.

All the feature diabetes affect learning, study habits, enthusiasm and education in general. For effective learning and creative thinking, concentration, enthusiasm, dynamic nature of the young generation is a must. So an effective system of physical education with a core analysis of the present health conditions stressing the diabetes status is the need of the hour. Here comes the importance of proper analysis of the theoretical background of any of the areas of research, particularly the issues with respect to diabetes and risk of diabetes.

Background of Study

The emerging epidemic of life-style diseases, Diabetes is the most important. Even though, a great deal of discussions occur about the emerging epidemic of life-style disorders, the fact still remains to be reflected in policy making and not translated in to action. Not only the genetic pre-disposition, but also various environmental factors play crucial role in the causation of the disease and this fact often gets ignored and the disease gets trivialized to the level of a genetically determined one. The role and influence of environmental factors are often riot highlighted with the result that many people realize that they could be afflicted with the condition only after the disease had set in, or even irreparable damage had been done to many organs or organ systems.

Diabetic risk in this study means the chance of becoming diabetic in future. In this study diabetic risk will be identified using the Indian Diabetes Risk Score (IDRS) developed by Madras Diabetes Research Foundation (MDRF), considering the criteria like age, waist circumference, physical activity and family history of diabetic. Based on this study it is intended to evolve a diabetic care education curriculum at the teacher education level for the effective used of it in the future.

Kerala's achievements in health have been universally recognized and praised. The dramatic decline in fertility and child mortality during the last four decades has given Kerala reputation as the healthiest state in India. During the last decade, crude death rate has shown a steady rise from an all time low of 5 per hundred to the current levels of composition alone; rather it suggests an increase in mortality in the middle age group. Kerala has experienced a health transition from that of a high child mortality-high morbidity picture to that of low child mortality-high adult morbidity situation in just over one generation time. In other words our health picture has taken a quantum leap from that of an under developed society to that of a developed, urbanized society. The paradox is that by western standards we are still a low consuming society both in terms of food consumption and economic consumption.

The multi-factorial causation, the presence of co-morbid conditions, development of complications and the ensuring morbidity and mortality are often not fully realized. Since the disease is not a rapid killer, as is the case with many infective disorders, the 'silent damage and often the silent killing' fails to impress the lay person. Similarly a panicky public health response is often lacking in the case of such diseases. The economic implications of the morbidity are often beyond the perception of even the healthcare providers and the challenge posed by the emerging epidemic to the resource strapped health system is often formidable.

Need and Significance of the study

Number of diabetics in India is at 4 cores. Number of Diabetics in the world in 1995 was 124.7 million. Number of Diabetics in the world in 2000 is 153.9 million. Number of Diabetics in the world in 2025 will be

299.1 million. It is gradually becoming more dangerous than AIDS. India is the Diabetes capital of the world with Hyderabad is the Diabetes capital of India. Here are some of the facts about this silent disease. November 14 is observed as the World Diabetes Day. One in every five diabetics in the world is an Indian. India now has 35 million Diabetics. Diabetes has no cure. Major cause of diabetic death is Heart Attack. Obesity is the major cause of diabetes in the adults.

As per WHO's The World health statistics 2012 report, one in six adults obese, one in 10 diabetic and one in three has raised blood pressure Diabetes needs to be identified as public health problem and needs to be addressed in that mode. Emphasis needs to be on risk reduction, prevention, detection, management, prevention of complications, and rehabilitation. It could be made possible only with full community involvement.

By a most conservative estimate, there are about 1.5 million diabetic subjects in Kerala. These people need lifetime management involving lifestyle modifications, drugs and diet. The economic cost of managing diabetes in Kerala is mind-boggling. When we learn from our studies that most of the diabetic subjects are getting irrational and unscientific management in our state, we can only shudder at the thought of future increase in numbers of people suffering from advanced renal failure, and blindness two dreaded complications of diabetes.

Kerala has to undertake a massive lifestyle education programme. The thrust has to be on physical activity, prudent eating and abstinence from tobacco. Early detection through screening for diabetes hypertension and overweight has to be integrated into the culture of the Keralite. Time is not on our side. Only timely action can help defuse the bomb.

Need of Diabetes Care Education

It is known that many patients suffer from the diabetes and its complications due to lack of awareness among the common man on the occurrence of heart attacks, blindness, kidney damage, leg ulcers, loss of sexual ability etc. So we need to give a awareness about the silent killer after identifying it in the early stage.

The education of the future providing poor man's total span must be oriented to his fulfillment as an individual person, as a creative worker and as a member of his society at local, national and global level. The educational programs and process should be related to the need of contemporary man looking towards a fast changing picture, the integrity, ability and wellness of man, achieved through an appropriate system education is the most precious asset of the individual and his society and it is this aim which needs now to be translated into curricular content. Such a curricular content of educational programs and experience need to him conceived and planned in to context of education.

While selecting the teacher educators and teachers under this study teacher educators are equipping teachers trained and this trained become teacher and they equip the society so it is need to be identified the diabetic risk of this group and make awareness about this silent killer and also evolve a course of diabetic care education.

The present paper is entitled as a study on *“The Urgency of Evolving and Implementing a Diabetic Care Education Curriculum at Teacher Education Level”*.

Objectives of the Study

1. To find out the diabetic risk among teacher educators and school teachers.
2. To analyze the opinion of teacher educators regarding the evolving and implementing diabetic care education course at teacher education level.

Methodology in Brief

In order to achieve the objective of the study investigator selected survey method. Documents of Indian Medical Association, Amrita Institute of Medical Sciences and Research, Govt. Medical Colleges, Health Reports, World Diabetes Federation, etc are used. The major tools used in the study are; Documents related to Diabetes (Documents of Indian Medical Association, Amritha Institute of Medical Sciences and Research, Govt. Medical Colleges, Health Reports, World Diabetes Federation, etc); India Diabetic Risk Score (IDRS) developed by MDRF, etc.

In the present study the sample taken had been stratified with regard to locale, gender, marital status, age, etc. The sample of the study consists of 60 teacher educators and 120 high school teachers from Kottayam district. The qualitative statistical techniques are used in this study.

ANALYSIS AND INTERPRETATION OF THE DATA

1. Identification of Diabetic Risk of Teacher Educators and Schools Teachers

The main objective of the study is to identify the diabetic risk of teachers in order to archive this objective the investigator used the Indian diabetic risk score developed by Madras Diabetes Research Foundation (MDRF).

Table 1

The Diabetic Risk of Teacher Educators and Teachers

Sl.No	Diabetic status	No. of respondent	Percentage
<i>Teacher Educators</i>			
1	Diabetic	5	9
2	High risk	23	38
3	Moderate risk	23	38
4	Low risk	9	15
	Total	60	100
<i>School Teachers</i>			
1	Diabetic	11	9
2	High risk	39	33
3	Moderate risk	58	48
4	Low risk	12	10
	Total	120	100

From the above Table 1 shows that 9 % of the respondents are diabetic that means they are all ready diabetic patients, 38 % of the respondents have very high risk of having diabetic, 38% of the respondents are moderate risk of having diabetic and 15% of the respondents have low risk. This shows, in future 85% of teacher educators will either diabetic or at risk. It means, we need more concentration on the health related practices in the teacher education level. Only a healthy teacher can give education and training in its maximum expected quality.

The table 1 shows that 9 % of the respondents (school teachers) are diabetic that means they are all ready diabetic patients, 33 % of the respondents have very high risk of having diabetic, 48% of the respondents are moderate risk of having diabetic and 10 % of the respondents have low risk. The following graph will give clear picture. This shows, in future 88% of school teachers will either diabetic or at risk. It means, we need more concentration on the health related practices in the teacher education level. Only a healthy teacher can give education and training in its maximum expected quality.

2. Analysis of the Component Need for Course

The knowledge and awareness about life style diseases and diabetes care education is tested through using the tool, 'Life Style Diseases and Diabetes Care Education'. It consists of two areas; diabetes (awareness about diabetes and diabetes and future) and Diabetic Care Education course (need for a course, course implementation and teacher training). The second part is taken into consideration here and the data is presented in table 2.

Table 2

Responses of Teacher Educators with reference to the Component Need for a Course

Sl.No	Questions	No		%
1	Do you think that many of our students are suffering from diabetes?	Yes	24	40
		No	36	60
2	Diabetes rate among students are increasing day to day .Is it true?	Yes	32	53
		No	28	47

3	Is it necessary for giving awareness to students about diabetes?	Yes	33	55
		No	27	45
4	Is diabetes will affect the learning habit of the students?	Yes	40	67
		No	20	33
5	Do we need to implement a diabetes care education course?	Yes	34	57
		No	26	43
6	Do you know about the various programs conducted by WDF and other organization about diabetes and life style diseases in school/college?	Yes	29	48
		No	31	52
7	Do your school/college have arranged such program in school/college?	Yes	34	34
		No	26	66
8	Do the diabetes will influence the behaviour and attitude of the student?	Yes	38	63
		No	22	37
9	Most complication of diabetes is due to lack of awareness. Do we need to give awareness about diabetes?	Yes	32	53
		No	28	47

The above table 2 shows that 40% of the respondents respond that many of our students are suffering from diabetic and 60% of the respondent has opposite suggestion. 53% respondent said that diabetes among students is increasing day by day and 47% of them said it is not increasing day by day. 55% of the respondents have the opinion to give awareness about diabetes among students and 45% of them does not have this opinion. 67% of the respondent said that it will affect the learning habit of the student and remaining 33% of them said it will not affect the learning habit. 57% of the respondent suggest that we need to implement a diabetic care education course and 43% of the respondent said it is not necessary to implement a diabetic care education. 48% of the respondent has the awareness about the various programs conducted by WDF and other organisation and 52% of them does not have the awareness. 34% of the school and college have arranged the various programs and remaining 66% does not arrange such programs. 63% of the respondent has the opinion that the diabetes will influence the behaviour and attitude of the student and 37% of the said it won't influence the behaviour and attitude of the student. And 53 % of the respondent think that most complication in diabetes due to lack of awareness and need to give awareness and remaining 47 % of them does not have this opinion.

3. Need for Course Implementation at Secondary Level Teacher Education

The knowledge awareness about life style diseases and diabetes care education is tested through using the tool, 'Life Style Diseases and Diabetes Care Education'. It consists of two areas; diabetes (awareness about diabetes and diabetes and future) and Diabetic Care Education course (need for a course, course implementation and teacher training).

The second aspect of the tool, need for course implementation at secondary level teacher education and the responses of the teacher educators are presented in the following table 3.

Table 3

Responses of Teacher Educators with reference to the Component Course Implementation at Secondary Level Teacher Education

Sl.No	Questions	No	%	
1	Is it possible to implement a course for diabetic care education at teacher education level?	Yes	32	53
		No	28	47
2	Do our institutions have sufficient facilities for giving diabetes care education?	Yes	29	48
		No	31	52
3	If we implement the curriculum will it help to reduce the diabetes risk?	Yes	32	53
		No	28	47
4	Exercise is the best medicine for diabetes control. Do we need to include various exercise method in diabetes care education?	Yes	35	58
		No	25	42
5	Do we need any support from medical department for implementing	Yes	26	43

	course?	No	34	57
6	If we evolve a diabetic care education .which among the following should be given more importance? A. Identification methods B. Risk reduction /Prevention C. Diabetes over view D. All of this	A	7	12
		B	10	16
		C	1	2
		D	42	70

Two open ended questions were given to the subjects to give their opinion. With respect to the opinion about the implementation of course at secondary level teacher education 62 % of the respondents opined that, it very essential because awareness will help to reduce the risk, 6% of them opined that it is not necessary, 8% of them has no suggestion and 24 % of the opined that this course should be included in teacher education level, school level and college level and also include the programmes about life style diseases.

In response to the question, opinion about areas to be included in diabetic care education course majority of the opined the following areas

- Food habit to be followed
- Identification methods
- Prevention methods
- Rehabilitation and management
- Various exercise and awareness programmes

From the table 3, it is understood that 53% of the respondent has the suggestion that it is possible to implement a practice based course at secondary level teacher education and 47% of them does not have this suggestion. 48% of the respondent said that our institutions have sufficient facility for giving diabetic care education 52% of the respondent said that our institution does not have the facility. 53% of the respondents suggested for implement the curriculum so that the diabetes will be reduced and remaining 47% of them do not have this opinion. 58% of the respondents have the opinion to involve various exercise programmes in diabetes care education and 42% of them do not have this opinion. 43% of the respondent said that they need the support from the medical department and 57% of the respondent said that they do not need the support from the medical department and 12% of the respondent give importance to identification methods in diabetes care education, 16% of them give importance to risk reduction/prevention, 2% of them give importance to diabetes over view and majority 70% of them gives importance to all of this.

4. Analysis of the Document of World Diabetic Federation

Document published by the WDF shows the striking similarities in the profiles of death between Kerala and the United States of America is presented in the table 4.

Table 4

The profile of death between Kerala and the USA

	KERALA		USA	
	MALE	FEMALE	MALE	FEMALE
Infective diseases	5.9	6.3	6.8	6.7
Cancer	8.3	10.8	24.4	22.3
Heart diseases	52.8	46.5	43.9	47.0
Suicide /Accident	12.5	10.0	9.1	3.9
Lungs diseases	5.7	7.0	6.3	5.9
Others	6.5	7.9	8.0	14.5

The data presents a frightening scenario in terms of its implications to the society of Kerala. When cardiovascular deaths contribute to nearly half the deaths in a population, the state of health of the people is far

from satisfactory. The tale that the dead tells is a picture of highly morbid society, weighed down by heart disease, stroke, high blood pressure, cancer and diabetes. Collectively, these diseases are called modern lifestyle diseases, denoting the negative side of westernization of our culture.

By a most conservative estimate there are about 1.5 million diabetic subjects in Kerala. These people need lifetime management involving lifestyle modifications, drugs and diet. The economic cost of managing diabetes in Kerala is mind-boggling. When we learn from our studies that most of the diabetic subjects are getting irrational and unscientific management in our state, we can only shudder at the thought of future increase in numbers of people suffering from advanced renal failure, and blindness two dreaded complications of diabetes.

Major Findings of the Study

Following are the some of the major findings from the study.

1. From the study it is found that 9% of the teacher educators are diabetic, 38% of them are at high risk, 38% of them are at moderate risk and 15% of them are at low risk and 9% of the teachers are diabetic, 33% of them are at high risk, 48% of them are at moderate risk and 10% of them are at low risk so from the study it is understood that majority of the teacher educators and teachers are at high risk. And portion of them are already diabetic.
2. It is revealed from the component curriculum implementation that majority of the respondents said that it is possible to implement a diabetic care education course at teacher education level so that it will help to reduce the diabetes risk and our institutions have sufficient facility for implementing the course .majority of the teachers said that they need support from the medical department for evolving the course and the teacher educators we does not need the support .majority of the respondent consider exercise is the best method for the diabetes so various exercise methods should be included in the course. Identification methods, risk reduction/prevention, and diabetes overview all this area should be given more important in the course and majority of them opinioned to implement the course at secondary level teacher education.
3. From the documentary analyse between Kerala and USA it is found that the death rate is growing Kerala than USA epically in the case of life style diseases.

Conclusion

From this study, it is evident that, 85% of teacher educators or more school teachers will either diabetic or at risk in future. It means, we need more concentration on the health related practices in the teacher education level. Only a healthy teacher can give education and training in its maximum excepted quality. The present study helped to find out diabetes risk among the teachers and teacher educators and it is found that majority of them are at high risk. The study also revealed that diabetes is increasing among the children and youth. From the opinion of the teachers and teacher educators, diabetes risk can be reduced by giving awareness and they also suggested implementing the evolved diabetic care education course at teacher education level.

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