



Determination of Knowledge Levels of Nurses on Insulin Applications

Ülkü Saygılı¹, Serap Parlar Kılıç²

¹Health Care Services Department, Selcuk University, Konya, Turkey

²Nursing Department, Firat University, Elazığ, Turkey

Email address:

ulkusaygili@hotmail.com (Ü. Saygılı)

*Corresponding author

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Abstract: Diabetes Mellitus (DM) is a complex and common metabolic disease involved multiple organs disorders. Diabetes Mellitus characteristics features is high blood glucose level, leading to morbidity and mortality in world wide. In the current study, we aimed to assess the level of knowledge about insulin treatment and determination of educational requirements of the nurses who provide treatment and care for the diabetic individual. 101 nurses who agreed to fill out the questionnaire were included for this descriptive and cross sectional study. The obtained data wase valuated with number, percentage and average. Nurses; average age is 32.95 ± 6.21 , average of working years is 8.5 ± 1.32 years, 62.4% are married, 37.6% are single and 67.3 % are undergraduate. It was determined that 60.4% of the nurses had received in-service training for diabetes treatment and 81.2% of them had regularly followed the diabetes treatment. It has been identified that 92.1% of the nurses knew the effects of insulin treatment, 95.1% knew the insulin administration routes, 87.1% knew the insulin injection application areas, 90.1% knew the proper storage conditions of insulin, 85.0% knew the normal value of blood sugar. According to the results of the study, it is identified that the know ledge level of the nurses about diabetes is fairly enough. They are aware of the fact that the insulin treatment education (vocational school of health, university) should be given entirely during occupational training. It is also important that the education need so f the nurses should be identified and supported by in service training. This will be surely helpful for the nurses especially for those who are new at their jobs.

Keywords: Diabetes Mellitus, Insulin Treatment, Nurse

1. Introduction

Chronic diseases are the major cause of morbidity and mortality all over the World [1, 2, 3]. Diabetes Mellitus is a chronic disease and its prevalence is rapidly increasing [2]. Existing studies have revealed definite global increase in DM incidence and prevalence [3-6]. According to the International Diabetes Federation it is estimated that there were 44.3 million people in North America, 29.6 million people in South and Central America, 59.8 million people in Europe, 415 million people worldwide in 2015, and is going to be 642 million people by 2040 [4]. According to the World Health Organization data, while the visibility incidence of DM below the age of 18 is 4.7% in 1980, it is reported that this rate has increased 8.5% in 2014 [5]. According to the results of the Turkish Diabetes Epidemiology study

conducted in Turkey in 1997-1998, it was found that prevalence of type 2 diabetes was %7.2 and impaired glucose tolerance frequency 6% [7]. In Recently published Turkish Diabetes Epidemiology study II; 26,499 people over the age of 20 are examined across the country and the frequency of type 2 diabetes has increased significantly over the past years and the rate has reached 13.7% [8].

It is indicated that the main causes of this increase in DM prevalence are population aging, unhealthy nutrition, obesity and sedentary lifestyle [2, 9].

Diabetes Mellitus is a endocrine and metabolic disease that constitutes acute and chronic complications by causing carbohydrate, fat, protein, metabolism disorders which occur as a result of full-partial inadequacy of insulin hormone secreted from pancreatic beta cells or insulin inefficiency [10, 11].

DM; is a multi-factor disease that involves complex interactions between genes, the environment and individual characteristics and represents a serious public health problem in many developed countries [12]. Diabetes Mellitus is divided into four groups as Type 1, Type 2, gestational diabetes and diabetes mellitus. The part 90% constitute non-insulin dependent diabetes [13-15]. In Type 1 Diabetes there is insulin deficiency resulting from auto immune destruction of insulin-releasing beta cells. Insulin level is normal in Type 2 Diabetes but blood glucose levels cannot be normalized due to receptor resistance. Environmental factors such as low physical activity and obesity are important risk factors for the development of this type of diabetes [14, 16].

The main purpose of Diabetes Mellitus treatment is; prevent the development of diabetic complications that worsen the quality of life or even cause deaths [17]. At the same time, keeping blood sugar at a normal or near-normal level, the elimination of symptoms, the prevention of acute and chronic complications and thus the improvement of the quality of life are also among the main aims. Insulin therapy is used in diabetes treatment in many cases, especially in the later stages of Type 1 and Type 2 diabetes. The best way to keep blood sugar at normal levels in individuals with insulin-dependent diabetes is the effective administration of insulin therapy [18, 19]. Insulin is the highest order on World Health Organization main drug list and It is used in almost all countries with both short and immediate effect. The proportion of Type 2 diabetes patients treated with insulin is between 10 % and 25% [3, 20].

It is the responsibility of the entire health team to provide better control and comfort by administering insulin therapy for diabetic individual. With an effective patient education, the negative consequences of incomplete or in correct administration of diabetes treatment will reduce, the quality of life of diabetic individuals will be affected positively and the financial burden both on the country and the person will also be reduced. One of the most important factors in providing metabolic control on diabetic individuals using insulin is the correct application of insulin therapy. Health care workers and diabetic patients need to be educated about new developments on benefits of insulin, as well as insulin preparations and insulin injection system. Nurses should have information about how insulin works, when and why insulin is needed, how dosing regimens and how changes are made [19, 21]. In this study; it is aimed to determine the level of know ledge about insulin treatment and to determine the educational needs in this direction of nurses who provide treatment and care for sick individuals.

2.Materials and Methods

This descriptive and cross-sectional study was conducted with nurses working a university hospital. In the universe of work was formed by 405 nurses working in university hospital and sampling was enabled by 101 nurses

volunteering to participate in the survey. As a means of data collection in research; as a result of the necessary literature search, a questionnaire form composed of researchers and composed of various questions was used [22-25]. The questionnaire consists of two parts:

In the first part, socio-demographic data consisting of 6 questions including age, gender, marital status, education status, clinical study and study period of nurses were obtained. In the second part, there were 20 questions that questioned the know ledge of nurses about diabetes and insulin treatment. There is some information such as insulin effects, complications of insulin treatment, insulin administration routes, type according to duration of action, points to be considered when insulin is administered, how insulin is maintained hypoglycaemia indications and treatment, normal value of fasting blood sugar. Completing the questionnaire form collected by face-to-face interview method is completed in approximately 10-15 minutes. For the execution of the work the official authorization was obtained from the head of the hospital where there search was conducted. Ethical principles were taken into consideration during the implementation of the research. Nurses who participated in the study and there search were informed about the results obtained from there search. S PSS18 package program was used in the evaluation of the data. The obtained data were evaluated by number, percent distributions and average.

3. Results

When the findings obtained from the socio-demographic characteristics of the nurses are examined; it is observed that average age of them was 32.95 ± 6.21 , average of the study year was 8.5 ± 1.32 , 62.4% were married and the majority had graduated (67.3%) (Table 1).

In the study, 60.4% of the nurses stated that they had received in-service training for diabetes treatment, 81.2% had regularly followed the diabetes treatment and 75.2% wanted to receive training in diabetes treatment (Table 2).

When the distribution of answers given by nurses to information question s about insulin treatment is examined, it has been determined that the majority of nurses know the effects of insulin treatment, the causes of hypoglycaemia, insulin administration routes, insulin injection administration sites, proper storage conditions of insulin and the normal value of blood sugar (95.1%, 81.2%, 92.1%, 87.1%, 90.1%, 85.0%, respectively) (Table 3).

Table 1. Classification of Nurses by Socio-Demographic Characteristics

Socio-Demographic Characteristics	n	%
Age group		
20-30 years	42	41.6
31-41years	48	47.5
42 years and over	11	10.9
Marital status		
Married	63	62.4

Socio-Demographic Characteristics	n	%
Single	38	37.6
Education status		
Health Vocational High School Graduation	4	4.0
Associate Degree	25	24.8
Undergraduate degree	68	67.2
Master Degree	4	4.0
Year of study		
0-5years	42	41.6
6-11years	38	37.6
12 years and over	21	20.8
Total	101	100

Table 2. Classification of Nurses according to Education Status of Diabetes Treatment

Features	n	%
In-service training for DM treatment		
Yes	61	60.4
No	40	39.9
For DM Treatment Posting Status		
Yes	82	81.2
No	19	18.8
For DM Treatment Education Demand Status		
Yes	76	75.2
No	25	24.8
Total	101	100

Table 3. Classification of Nurses According to the Answers to Information Questions about Insulin Therapy.

	Known		Unknown		Partiallyknown	
	n	%	n	%	n	%
Effectsofinsulin	96	95.1	5	4.9	-	-
Complications of insulin therapy	51	50.4	13	12.8	37	36.6
Hypoglycaemia indications	59	58.4	6	5.9	36	35.7
Causes of hypoglycemia	82	81.2	8	7.9	11	10.9
Hypoglycemia treatment	81	80.2	10	9.9	10	9.9
Insulin administration routes	93	92.0	4	4.0	4	4.0
Insulin infusion pump	11	10.9	90	89.1	-	-
Insulin injection applicationareas	88	87.1	12	11.9	1	1.0
Variation according to duration of insulin action	52	51.5	15	14.9	34	33.7
Insulin mixing	87	86.1	14	13.9	-	-
Insulin hiding	91	90.0	4	3.9	6	5.9
The normal value of fasting blood sugar	85	84.2	15	14.8	-	-
Equality of cc insulin to unit	45	44.6	56	55.4	-	-

4. Discussion

One of the most important factors in achieving metabolic control in diabetic individuals using insulin is the correct application of insulin therapy [6]. If insulin therapy is not applied correctly, skin complications, hyperglycaemia or hypoglycaemia develop is inevitable [22]. Although the majority of nurses in the study indicated that their knowledge of insulin treatment was adequate, it was determined that the majority wanted to receive training in diabetes and treatment. This result is important in that nurses' knowledge is not only sufficient but also indicates that they want to update their knowledge. Nurses found themselves to be inadequate in relation to diabetic patient care and education [26]. Ogun and colleagues (2013) also found that all diabetic nurses wanted to receive more education about the care of diabetic sand that this education should be privatized for the subject areas. It was determined that 58.4% of the nurses knew hypoglycaemia symptoms. This shows us that although more than half of the nurses are aware of signs of hypoglycaemia, the other half is partially or completely inadequate. In Uçan and his friends' (2007) study, the inadequate response is an indication that the patients are at risk for this complication [24].

In our study, 50.4% of the nurses knew the complications of insulin therapy. Many complications can develop in the stage of treatment of diabetic individuals. In the study of Aslan and Korkmaz (2015); 33.6% of the patients were found to have pain /pain when using insulin, 32.7% of stiffness/

swelling, 54.5% of bruises, 79.1% of hypoglycaemia and 66.4% of hyperglycaemia [27]. It is recommended to use the needle once to prevent painful injection and damage to the skin [28]. Another reason why the pen needles should be disposable is the prevention of block age of pencil needles. In other work; it has been reported that higher dose insulin administration may lead to a faster leak, and it has been proposed to divide large doses. Higher insulin doses slow down insulin absorption, and It is also stated that subcutaneous administration of insulin over 50 IU may lead to more pain and leak age [27]. In another study interfering with insulin injection therapy, 20% of diabetics were found to have an injection anxiety or scar, 27% had injection sensitivity, and 37% had injection pain [29].

Significant duties fall in to diabetes educators, especially diabetes nurses. First, the diabetic individual, who will start insulin therapy or follow his or her own blood sugar, should be included in individual and group education programs and enabled to express feeling sand thoughts about the process; treatments and practices and also the patients' will and ability to do so must be assessed prior to treatment and administration [15, 30]. In our country studies among the professional errors faced by the nurses, drug applications are ranked first in the rate of 47%. Errors in drug applications occur during prescribing, requesting preparing the drug, dispensing and administration. Lack of information, lack of communication, time insufficiency, night shift and work load are factors that affect the occurrence of drug mistakes [31-34].

It is very important to make people feel that diabetes is the

primary responsible for their health for prevention of hypoglycaemia without further development and in case of a development, the necessary treatment and care can be applied quickly. It was founded that very few of the nurses knew about the insulin infusion pumps in the study. The use of the insulin pump provides the patient with the flexibility to change the insulin dosage according to the situation in the treatment of insulin. More than 300,000 diabetic patients use insulin pumps and most of them are Type 1 diabetic individuals [34]. In the study; ¼ of the patients had a hypoglycaemia problem within the past month and this problem was found on rate 37.2% of the number three and above [2]. When the causes of patients experiencing hypoglycaemia according to their own expressions in the same study, patient sex pressed some reasons such as making too much insulin, skipping breakout meals and eating too little food. Again in the same study, while the blood sugar level of half of the patients did not exceed 250mg/dl in the last month, about 29.2% of them had blood sugar levels of 1 to 3 times greater than 250mg/dl. It is supported by many studies that there is a vital relationship between tight glycaemic control and well-coordinated disease management by avoiding complications of diabetes [35].

Insulin infusion pumps have been used in the management of approximately 375,000 diabetic patients in the United States. It is stated that nurses have very important roles on illness education such as how to give intensive insulin treatment to a diabetic individual using insulin pump, how the insulin pump works, advantages- disadvantages, fixing the problem in the case of problems with insulin pump [12, 35].

5. Conclusion and Contribution

Nursing care and interventions are very important in patients with diabetes mellitus. Especially; prevention of complications can be provided with good care. Therefore, more effective, educated, autonomous professional professions should be supported. In- service training should be done by considering the knowledge status of the nurse. Continuous feedback is an important part of training.

Nurses in diabetic individuals need educational, supportive and developing nursing practices. These applications include; support, guidance, environmental regulation and teaching of disease treatment. Thus, these facts participate in the treatment of the individual, maintain glycaemic control, prevent acute and chronic complications, and increase the quality of life of the individual.

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