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A Review of Fatigue Condition in Patients with Type II Diabetes in Isfahan Endocrine and Metabolism Research Center

Nasim Vard[1], Heidar Ali Abedi[2] and Masoud Amini[3]

[1]Graduate Masstter in Community Health Nursing, Department of Nursing and Midwifery, Khorasgan Branch, Islamic Azad University, Isfahan, Iran.
[2]Associate Professor, Department of Nursing and Midwifery, Khorasgan Branch, Islamic Azad University, Isfahan, Iran.
[3]Professor, Medical Faculty, Isfahan University of Medical Sciences, Isfahan, Iran.
Corresponding Email: vard.nedu@yahoo.com

ABSTRACT

Complications of Diabetes such as Fatigue is a serious obstacle hindering the enhancement of health behaviors, including participation in Diabetes self-care programs, and is considered as a challenging problem for nurses and health-care providers in the process of diseases' treatments and therapies. These complications not only influence the patients' quality of life, but also, increases the risk of complications. Hence, regarding the importance of the role of fatigue and its subsequent effects on Diabetes' control as well as the paucity of studies carried out in this field, the current research intended to review fatigue condition in patients with type II Diabetes in Isfahan Endocrine and Metabolism Research Center. The nature of this study is a Quantitative-Descriptive research. For the purpose of the present study, 195 patients with type II Diabetes were selected as the target sample population, based on Non-probability Convenience Sampling Method, from Isfahan Endocrine and Metabolism Research Center. To collect the research data, the researcher used a two-part written questionnaire encompassing Personal Information and Multidimensional Fatigue Symptom Inventory- Short Form (MFSI-SF) as the data collection tool. Each of the participants in the present research were briefly advised about the nature and objectives of the research and they were interviewed by the researcher to complete the questionnaire after consent reached with the patients. The collected data was analyzed by $SPSS_{16}$ statistical analysis software; accordingly the significance level of all the tests was estimated as $P<0.05$. The results of the data analysis showed that %85.1 of the patients suffered from fatigue. There was a statistically significant difference between the mean of the severity of fatigue condition between female and male patients in the present study, i.e.23.22 ± 17.49 for women and 13.24 ± 17.73 for men, indexing a significance level of $P<0.05$. Furthermore, the highest score amongst the Multidimensional Fatigue yielded 6.80 ± 5.44 and 9.32 ± 5.33 respectively for the General Fatigue Dimension in male patients and Emotional Fatigue Dimension in Female Patients. Considering the increasing spread of fatigue in patients with Type II Diabetes, proper actions for prevention, diagnosis and treatment of fatigue symptoms can have a significant effect on Diabetes Control and effectively enhance the quality of nursing services and nursing cares of patients with Diabetes. As a consequence, it is recommended that health-care providers, particularly Community Health Nurses, pay the most attentions to this critical point in caring and training the suffering patients with Diabetes.

Keywords: Fatigue; Type II Diabetes; Multidimensional Fatigue Symptom Inventory- Short Form (MFSI-SF); Community Health Nurse.

INTRODUCTION

Along with the changes in life styles and increases in life expectancy, which are the results of industrialization of countries in the 21st century, the patterns of the most diseases have been transformed from acute diseases to chronic diseases [9]. According the reports of American Diabetes Association, one of the chronic diseases which can subsequently result in physical and mental problems in patients, is Diabetes [19].

Type II Diabetes, which is frequently prevalent in adults AKA Adult Diabetes or Life-style Diabetes, is a complex Metabolic and Endocrine Disorder which covers 90 to 95 percent of the types of the Diabetes [16]. The interference between multiple environmental and genetic factors causes a heterogeneous progressive disorder with varying degrees in pancreas beta cell dysfunctions and insulin resistance[10].

The progress of complications and the high costs of treatments in patients with diabetes is mainly the result of poor blood glucose control. Therefore, keeping blood sugar at a normal and healthy level is the vital action in Diabetes care, and accurate diabetes control delays the commencement and progress of its due complications [9]. Scrutinizing the published articles and searching the online databases have shown that diabetic patients are seriously struggling with barriers to learning about Diabetes and self-care principles; one the most common of these obstacles is the complications and physical discomforts such as fatigue caused by Diabetes [20].

Patients suffering from diabetes consider fatigue as one of the most problematic and challenging aspects of their disease [18]. Clinical research findings show that fatigue is a serious barrier to diabetes control and self-management [22]. This evidence not only affects the quality of life and its compliance with disease treatment but also is associated with an increase in risk of disease complications [13].

Fatigue is defined as the feeling of persistent debilitating and extreme tiredness and lethargy which decrease the patients' ability to perform physical and mental activities [2], and their routine performance in family and social roles [3].

According to the research in the western countries, it has been reported that chronic fatigue was a life disabling factor for about 6 months and above in %5 to %15 of the patients in health-care centers and in %1 to %10 of the public population [12]. Even though chronic fatigue is a common vent among public people (18), diabetic patients complain two times more than non-diabetic people about fatigue [23]. In a study on 1137 patients with newly-diagnosed Type II diabetes, the prevalence of fatigue was reported as %61 [13]; likewise, as reported by ISNA Health Service Group in 2011, a statistical research in America has found that %85 of diabetic patients declared that the most important challenge they dealt with was fatigue which made their life and daily routines difficult [8].

Amongst the problems caused by fatigue in diabetic patients are the lack of energy, motivation, sufficient concentration when participating in medical treatment programs as well as the failure to comply with medical instructions and health recommendations due to the lack of necessary participation in self-care programs and unwillingness in participating in medical training programs [14]. Thus, fatigue is a serious obstacle hindering the enhancement of health behaviors, including participation in Diabetes self-care programs, and is considered as a challenging problem for community health nurses in the process of diseases' treatments and therapies[6].

Considering the important role of fatigue and its subsequent effects on Diabetes' control which is to a great deal considered as a self-management disease which requires daily cares as well as the paucity of studies carried out in this field, the current research intended to review fatigue condition in patients with type II Diabetes in Isfahan Endocrine and Metabolism Research Center.

MATERIALS AND METHODS

In this cross-sectional descriptive research, 195 patients with type II Diabetes were selected as the target sample population, based on available sampling method, from Isfahan Endocrine and Metabolism Research Center. Each of the participants, selected based on the research input criteria, were sufficiently advised about the nature and objectives of the research and they were interviewed by the researcher to complete the questionnaire after consent reached with the patients.

To collect research data, the researcher used two questionnaires as the data collection tool. One questionnaire consisted of two sections: The former section, i.e. Personal Information, collected Demographic Characteristics (Age, Sex, Height, Weight, Occupation, Education, Marital Status, and Physical Activity) and the latter section dealt with the Disease Information (Disease Duration, Type of Treatment, the result of the glycated hemoglobin last test(HbA1C), Serum Lipids and Chronic Complications of Diabetes).The other questionnaire included a short form of a Multidimensional Fatigue Symptom Inventory (MFSI-SF), whose validity and reliability were estimated and confirmed and which was translated to Persian by the researcher. The Persian questionnaire was reviewed by 8 university professors of the Nursing and Midwifery faculty from Islamic Azad University, Khorasgan Branch who confirmed its validity. This questionnaire consisted of 30 items and 5 fatigue dimensions including General, Physical, Emotional, Mental and the last dimension was Vigor indicating the extent of power resisting to fatigue; the 5 dimensions of MFSI-SF was ranked based on LIKERT five-point scale. Each item was scored ranging from 0 (Never) to 4 (Very much). Accordingly, the overall score of each dimension varied from 0 to 24 while the overall score of fatigue was calculated subtracting the score of Vigor Dimension from the overall score of the other remaining 4 dimensions of fatigue equaled -24 to 96. Except for the Vigor Dimension, the higher score in all the other four dimensions indicated the excessive fatigue while it indicated a moderate fatigue in Vigor Dimension. The collected data was analyzed by $SPSS_{16}$ statistical analysis software though Chi-square test, Independent T-test and ANOVA.

RESULTS

The mean and the standard deviation for the age factor of subjected patients, who mostly (%54.9) aged 30 to 39 years old, were respectively 54.14 and 6.88. Almost %68.7 of the sample participants were female while %31.3 were male. A majority of the subjects participating in the present research were Married (%90.8) and Undergraduates (%52.3). With regard to the degree of the physical activity, %65.6 of male participants had average physical activity whereas %52.2 of female did not have average physical activity.

The highest prevalence of subjects in women (3/49) obese and in men (1.54) were overweight. (Table 1).

TABLE 1: THE DEMOGRAPHIC CHARACTERISTICS OF PATIENTS WITH TYPE II DIABETES

Sex / Variable		Male		Female		All Subjects	
		Frequency	Percentage	Frequency	Percentage	Frequency	Percentage
Age	30-39	0	0	3	2.2	3	1.5
	40-49	10	16.4	29	21.6	39	20
	50-59	37	60.7	70	52.2	107	54.9
	Above 60	14	23	32	23.9	46	23.6
Education	Illiterate	4	6.6	26	19.4	30	15.4
	Undergraduate	23	37.7	79	59	102	52.3
	Diploma	16	26.2	22	16.4	38	19.5
	Graduate	18	29.5	7	5.2	25	23.6
Marital Status	Single	0	0	1	0.7	1	0.5
	Married	61	100	116	86.6	177	90.8
	Divorced (Widowed)	0	0	17	12.7	17	8.7
Smoking Status	Yes	4	6.6	2	1.5	6	3.1
	No	57	93.4	132	98.5	189	96.9
Physical Activity	Yes	40	65.6	64	47.8	104	53.3
	No	21	34.4	70	52.2	91	46.7
BMI	Normal Weight	14	23	14	10.4	28	14.4
	Overweight	33	54.1	54	40.3	87	44.6
	Obesity	14	23	66	49.3	80	41

TABLE 2: THE FREQUENCY DISTRIBUTION OF SUBJECTS IN TERMS OF SEX FACTOR AND FATIGUE CONDITION

Sex / Fatigue Condition	Male		Female		All Subjects	
	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage
No Fatigue	16	26.2	13	9.8	29	14.9
Poor Fatigue	30	49.1	61	45.5	91	46.7
Average Fatigue	11	18	50	37.3	61	31.3
Severe Fatigue	4	6.5	10	7.4	14	7.2
Worst Fatigue	0	0	0	0	0	0
Total	61	100	134	100	195	100

Table 2 illustrates that based on the Fatigue Condition Classification, %46.7 of the patients suffer from poor fatigue condition, %31.3had average fatigue condition and %7.2 had severe fatigue condition while %14.9 of patients did not have any fatigue.

TABLE 3: THE MEAN AND STANDARD DEVIATION OF THE SCORE OF FATIGUE MULTIDIMENSIONAL FACTORS IN SUBJECTS IN TERMS OF SEX FACTOR

Sex	Male		Female		All Subjects	
Fatigue Dimensions	Mean	SD	Mean	SD	Mean	SD
General Fatigue	6.8	5.44	8.47	4.98	7.95	5.18
Physical Fatigue	4.42	4.02	8.18	4.84	7	4.92
Emotional Fatigue	5.9	4.88	9.32	5.32	8.26	5.42
Mental Fatigue	5.7	3.89	6.18	3.96	6	3.94
Vigor Fatigue	9.59	4.27	8.95	3.91	9.15	4
Overall Fatigue	13.24	17.73	23.22	17.49	20.1	18.13

The mean of the scores of fatigue multidimensional factors shows a higher value in female than in male patients except for the Vigor Dimension (Table 2). The mean and the SD of the overall fatigue scores (-18−61) in male participants were estimated as 13.24 ± 17.73 respectively whereas the same measures of the overall fatigue scores (-10−65) in female patients were calculated as 17.49 ± 23.22 successively. According to the results of the independent T-test (t: -3.70; DF: 190; $P<0.05$), there is a statistically significant difference between the means of overall fatigue scores amongst male and female patient groups.

According to the classification of the severity status of each of the fatigue dimensions, General Fatigue has got the highest frequency index as %60.5 and the frequency indices for the other fatigue dimensions were %61.5 for physical fatigue, %55.4 for Emotional fatigue, and %76.9 for Mental fatigue all of which were categorized as poor fatigue satatus. The Vigor Fatigue Dimension with %53.3 of frequency was classified as an average fatigue (Table 4).

TABLE 4: THE CUMULATIVE AND RELATIVE FREQUENCY DISTRIBUTION OF SUBJECTS IN TERMS OF FATIGUE DIMENSION AND SEVERITY STATUS

Fatigue Dimension	General		Physical		Emotional		Mental		Vigor	
& Status	QTY	%	QTY	%	QTY	%	QTY	%	QTY	%
Poor (0-8)	118	60.5	120	61.5	108	55.4	150	76.9	85	43.6
Average (9-17)	64	32.8	72	36.9	77	39.5	43	22.1	104	53.3
Worst (18-24)	13	6.7	3	1.5	10	5.1	2	1	6	3.1
Sum	195	100	195	100	195	100	195	100	195	100

RESULTS AND DISCUSSION

The results of the research shows that the mean and the SD of the age factor of the subjects indicates 54.14 ± 6.88. The age group 50-59 got the most percentage (%54.9) while the least percentage (%1.5) belonged to the subjects aging 30-39. With regard to the sex of the population, %68.7 and %31.3 of the participants were female and male respectively. The mean of the duration of the disease in patients with Type II Diabetes was 10.74 with the SD 6.20. Regarding the medication patients used, %50.8 and %41.8 of successively male and female took Glibenclamide and Metformin simultaneously. For the Hemoglobin A1C, the mean was estimated as %7.62 and the SD indexed 1.64; most of the patients (%57.4) had Hemoglobin A1C above %7.

According to the fatigue condition classified in the present study, %49.1 of males and %45.5 of female had poor fatigue condition whereas %6.5 of men and %7.4 of women had severe fatigue condition; the average fatigue condition appointed to %18 and %37.3 of females and males in turn.

Khoshandish (2011) conducted a contrastive study to compare the spread of fatigue between the patients with diabetes mellitus and healthy people in Shiraz [11]. He found that among the patients about %55.75 suffered from fatigue among which %24 had severe fatigue condition. The results of study done by Khoshandish were not consistent with the findings of the current research. Monjamed et al (2006) investigated the quality of the life of the patients with chronic complications of diabetes in Endocrine clinic of selected hospitals in Tehran [15]; accordingly the researcher concluded that %69 of the patients had an immense feeling of fatigue and tiredness. According to the

results of a study by Drivsholm et al (2005) on determining the signs, symptoms and complications of type II diabetes in newly-diagnosed patients and their relationships with the levels of blood sugar and blood pressure in Denmark [5], it was found that the spread of fatigue in patients was estimated as %61.

The results of the present research displays that the spread of fatigue in females is higher than male subjects. Valentine et al (2009) studied the genders differences in terms of Obesity, C - reactive protein (CRP), Physical Activity, Depression, Sleep Quality and Fatigue in elderlies [21]. He concluded that the spread of fatigue was higher in women than in men (%65 to %40 in turn) which is consistent with the results of the present study. The reason of the differences in the spread of fatigue between female and male patients is multifactorial and is probably related to the biological and psychological factors.

Based on classification of fatigue severity, a majority of participants felt fatigue in terms of General, Physical, Emotional and Mental dimensions at a poor level whereas the ability to resist fatigue which indicative of Vigor Fatigue was at an average level among subjects.

Moreover, the mean and the SD of the total fatigue score amongst the research subjects were 20.10 and 18.13 indicating poor fatigue. The mean of the values of the fatigue dimensions except for Vigor fatigue showed a higher degree in females in comparison to males that is fatigue was most widespread among women than men. And according to independent t-test results ($t= -3.7$, $df =190$, $p<0.05$) mean score of fatigue in men (24/13) and women (22/23), the difference is significant.

Moreover in this study, the emotional fatigue dimension got the most score amongst the other dimensions. Hardy et al (2010) who studied the quality of fatigue condition and its relationship with the finite patterns of clinical features, found that there was a statistically significant relationship between diabetes and emotional fatigue [7]. The results of Hardy's research were consistent with the results of the current study.

Emotional dimension of exhaustion refers to lack or reduction of motivation to start any activity [4]. Behavioral and emotional disorders including psychological ones such as depression cause continuation of feeling exhausted [1]. Depression and stress caused by diabetes that are expressed as the exhaustion of diabetes are related to exhaustion. A person suffering from diabetes exhaustion or in other words, emotional exhaustion understands that good control and taking care of diabetes are important for his health but lacks the incentive to take care of himself. The data collected from 87 patients with type II diabetes confirms that the stress of living with diabetes disrupts the sense of health and well being and leads to energy depletion and exhaustion [6].

CONCLUSION

To conclude, considering the high degree of fatigue prevalence and its complications among the patients with type II diabetes and with regard to the fact that community health nurses are trained to learn the needs of patients focusing on not only the identity of the patients in family and in society but also the interactions between nurses and patients and their families in order to improve health issues and prevent the forthcoming diseases and subsequent complications [17], prevention, diagnosis and treatment of fatigue with the help of the nurses dealing with these patients can have a significant effect on diabetes control. Consequently, the present research focuses on enabling the patients to perform self-care behaviors as well as enhanced diabetes control in the process of training the patients with diabetes.

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