

Correlation Between Type D Personality and Medication Adherence in Patients with Systolic Heart Failure

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Background: Identify factors affecting medication adherence is effective in the planning of patient care, education and follow-up of heart failure patients. This study aimed to investigate the correlation between type D personality and medication adherence in patients with systolic heart failure was performed.

Methods: This was a descriptive -correlational study . 100 patients with systolic heart failure at least one year experience of developing heart failure and ejection fraction below 40% admitted to hospital Alborz Social Security of Karaj and the Social Security Hospital of Shahriar in 2013 using convenience sampling were entered into the study. Demographic data and type-D personality questionnaire, medication adherence scale in patients with heart failure, was completed by interview. Data was analyzed by SPSS software version 18 and using descriptive statistics and coefficient Pearson correlation.

Results: 75% of total systolic heart failure patients had type D personality. The %65 of total patients was poor medical adherence. There was a significant negative moderate correlation between Type D personality and medical adherence ($p < 0.001$).

Conclusion: Patients with systolic heart failure with type D personality had lower drug adherence. Screening of type D personality in patients with heart failure and referral for counseling and appropriate treatment can help to enhance medication adherence of heart failure patients.

Keywords: Systolic heart failure; Medication adherence; Type D personality.

Introduction

Heart failure is a common and life-threatening disease [1]. More than 37.7 million people worldwide [2] and 8% of Iranian population suffer from heart failure. The prevalence of this disease in Iran is higher than that of the Middle East and even the world [3]. Re-admission and prolongation of hospitalization of the patients with heart failure are the factors that increase cost of treatment [4]. The increasing cost of treatment for heart failure emphasizes the need to focus on strategies to prevent and improve the effectiveness of care [5].

Heart failure patients use a variety of medications, such as diuretics, angiotensin converting enzyme inhibitors, beta-blockers, digestive and spironolactone [6]. The goal of medication therapy is to control symptoms, maintain and improve quality of life, reduce mortality and morbidity, and disease progression [7]. Patients with heart failure require a consistent adherence to complex medication therapy [8]. Adherence to medication is an important part of self-care behaviors [8] for achieving a better outcome [7, 9]. Adherence to medication therapy is a behavioral response to receiving medication by consenting to prescribe medication delivery by healthcare providers and receiving regular and ongoing medications [10]. The four most important components of adherence include taking the prescribed daily dose, correct medication, correct dose of the medication, and the correct timing of the medication, ± 2 hours from the scheduled time and preventing the interruption of medication use for more than 48 hours [10, 6]. The inadequate adherence to medication therapy in people with chronic illness is a global problem. According to the World Health Organization, more than 50% of patients with chronic illness do not comply with their medication therapies [11]. The medication adherence rate varies from 10 to 98% depending on the definition and method of measuring and analyzing medication adherence [12]. The lack of medication adherence is one of the most important self-care challenges in patients with heart failure, which is associated with increasing negative outcomes of the disease, re-admission,

increased disease severity, decreased quality of life, and increased risk of cardiac events, mortality and increased treatment costs [13-15]. Medication adherence is a multi-dimensional phenomenon and is influenced by factors related to health systems, socioeconomic status, social support, and factors related to disease and treatment [16].

Psychosocial factors affect health status. One of the most common ones is the behavioral pattern A, which includes ambitions, aggression, competition, impatience, pessimism, hostility, and increased potential for anger. People with Type A personality are more likely to be at risk for cardiovascular disease. Type D personality has also been introduced today by factors affecting the health of the individual. Type D personality has two fixed personality traits and a general negative affect and social inhibition.

Personality characteristics and traits are often constant over time and lead to chronic emotional stress. Increasing levels of cortisol following stress have a mediatory role in increasing cardiovascular disease [17]. The negative emotional dimension in the type D personality implies the experience of negative emotions such as depression, anxiety and irritability in different situations. These people have a negative attitude towards themselves and are more concerned with the troubles of the world. The purpose of social inhibition in type D personality is the desire of individuals to avoid negative emotions in social interactions. People with negative affect and social inhibition frequently suffer from depression, chronic stress, anger, nausea, low social support and a low level of well-being [18]. The results of one study showed that 31.9% of heart failure patients had a type D personality [19]. The Patients with heart failure who have Type D personality are more exposed to health disorders [20], depression [21], mortality, increased severity of heart failure [22], anxiety, low quality of life [23], mental health disorder and disability [20].

medication adherence plays an important role in improving quality of life, reducing the rate of hospitalization, mortality and health costs of heart failure patients; therefore,

identifying the factors affecting it is essential for the planning of nursing care, training and follow up tests. This study aimed to investigate the correlation between type D personality and medication adherence in patients with heart failure.

methods

This was a descriptive-correlational study performed on all patients with systolic heart failure hospitalized in social security organization hospitals in Alborz and Shahriar, Iran in 2013. The research sample was selected according to the inclusion criteria (at least one year history of heart failure, ejection fraction below 40 % (by simple sampling. Brice et al. [2007] stated that the minimum sample size for correlation studies should be 100 [24]. Therefore, in this study, the sample size was considered 100. The research tool was a questionnaire consisting of three sections: demographic information, Type D personality questionnaire, and medication adherence scale in patients with heart failure.

Type D personality scale was created by Ahmadpour [2007]. The questionnaire consists of 22 questions including 5 factors of depression and anxiety [7 questions], social constraints [6 questions], irritability [4 questions], anger [3 questions] and verbal inhibition [2 questions] based on Likert score scale [4 = true , 3 = almost true, 2 = no idea, 1 = almost false, 0 = false]. The score range was from zero to 88 points. Based on cut-off point, a score above 44 was in favor of the Type D personality. Ahmadpour used Alpha-Cronbach's method, retest and duplication to test the reliability of the research tool. The coefficients obtained for each one were 0.85, 0.92, and 0.74. The result of the simultaneous validity of this questionnaire with the scale of 14 questions of the Denollet Type D personality was desirable (0.86) [25].

The medication adherence scale was designed and developed by Wo [2008] in patients with heart failure. The questionnaire consisted of 16 questions and 3 subscales of medication adherence attitude, awareness of medication adherence rate and barriers to medication treatment adherence, which were totally scored based on Likert scale from completely disagree [1] to completely agree [5]. The range of subscale score of the

awareness was between 3 and 15, with a higher score indicating more awareness of prescribed medications. The score of patient's attitude subscale to received medications was between 4 and 20, with a higher score indicating positive attitude toward adherence to medication therapy. The range of score of the subscale of the barriers was between 9 and 45, with a higher score indicating fewer financial, cognitive, social, and functional barriers to medication delivery. The range of total score of the questionnaire was between 16 and 80, with a higher score indicating better medication adherence to medication regime, also based on cut-off point, score 16 to 36 showed poor adherence, 37 to 58 showed intermediate adherence, and 59 to 80 revealed desirable medication adherence. The internal stability of the instrument was reported by analyzing the Cronbach alpha in three sub-scales ranging from 0.94 to 0.75 [7].

After obtaining permission from the designers of the questionnaire to use it in this study, the content validity method was used with the study of scientific resources and according to the research objectives in order to determine the scientific validity of the scale of medication adherence in the present study. In order to determine the reliability of the two questionnaires, a re-test method was used. For this purpose, the questionnaires were distributed to 10 patients with heart failure in 10-day intervals and the correlation between the two tests for the type D personality questionnaire was 0.81 and for the medication adherence scale was 0.86.

In order to collect the data, after acquiring the license and receiving the approval from the Medical Ethics Committee of the Faculty of Medicine [code 0051], the researcher went to internal section of the social security organization hospitals of Alborz and Shahriyar, obtained oral and written consent of the units and explained the research objectives. After that, two questionnaires on Type D personality and medication adherence scale were completed at the same time by individual interview and by one person. Information on the left ventricular ejection fraction was extracted from the patient's case. The data was analyzed using SPSS-18 and described by frequency distribution tables,

mean and standard deviation. normality of the research variables was confirmed by Kolmogorov-Smirnov test [$P > 0.05$]. The Pearson correlation coefficient was used to analyze the correlation of the two variables. In the present study, the Pearson correlation

coefficient between 0 and 0.3 was weak, 0.3 to 0.6 was average and more than 0.6 was strong. A significant level of 0.05 was considered.

Table 1: Demographic characteristics and some information about patients with heart failure

variable	Categories	Number (%)
Age (year)	Lower than 60	19 (19)
	61-70	44 (44)
	71-80	20 (20)
	Higher than 81	17 (17)
sex	Male	56 (56)
	Female	44 (44)
Marital status	Married	71 (71)
	Divorced and widowed	29 (29)
Educational level	Illiterate	53 (53)
	Elementary school	37 (37)
	Middle school and higher	10 (10)
job	Employed	9 (9)
	Unemployed	23 (23)
	Retired	32 (32)
	Housewife	36 (36)
Heart failure grade	Grade 2	39 (39)
	Grade 3	49 (49)
	Grade 4	12 (12)

Results:

The mean age of patients with heart failure was 68.56 ± 10 with a range of 49 to 88 ; 44% were in the age group of 61-70 ; 54% of the patients were males; 71% of them were married. 53% were illiterate and 36% of the patients were housewives. In terms of severity of heart failure, 49% of patients had grade 3 heart failure. The mean duration of diagnosis of heart failure was 3.7 ± 2.7 years, ranging from 1 to 12 years. Moreover, 25% of the patients had a history of re-admission in the last six months [Table 1].

The mean and standard deviation for different dimensions of type D personality and medication adherence are presented in Table 2. Based on the cut-off point of the questionnaires, 75% of patients had Type D personality heart failure, 65% showed poor medication adherence, 33% showed moderate

and 2% showed satisfactory medication adherence. Most of the barriers to medication adherence were to disregard medication use when the patients felt healthy (1.5 ± 0.9) and the least barriers to medication adherence were related to medication forgetfulness of 1.9 ± 1.2 and the cost of drugs (1.8 ± 1.1).

There was a moderate, inverse and significant correlation between the dimensions of anger of Type D personality and sub-scale of barriers to medication adherence ($p = 0.003$) and total medication adherence score ($p = 0.001$) (Table 3). There was a moderate and inverse correlation between the irritability dimension and the sub-scale of barriers to medication adherence ($p < 0.001$) and the total score of medication adherence ($p = 0.001$). Subsequently, the social constraint of Type D personality had a

weak, inverse and significant correlation with the sub-scale of barriers to medication adherence ($p = 0.008$) and the total score of medication adherence ($p = 0.027$). There was a significant and inverse correlation between depression and anxiety of Type D personality

and total score of Type D personality with a sub-scale of barriers to medication adherence and total score of medication adherence ($p < 0.001$).

Table 2: Mean and standard deviation of type D personality dimensions and medication adherence in patients with heart failure

Variable		Mean±SD	Maximum	Minimum
Dimensions of medication adherence	Awareness	3±7.8	14	3
	Attitude	2.4±7.3	15	3
	Barriers	8.8±17.3	41	10
Total score of medication adherence		10.5±32.6	59	16
Dimensions of type D personality	Anger	2.4±7.4	12	3
	Irritability	2.6±10.8	16	4
	Verbal inhibition	1.9±4.4	8	2
	Social constraint	5±12.3	24	6
	Depression and anxiety	5.7±18	28	7
Total score of type D personality		2.9±53.13	88	23

Table 3: Correlation between type D personality and medication adherence in patients with heart failure

Dimensions of medication adherence		Awareness of medication		Attitude toward medication adherence		Barriers to medication adherence		Total score of medication adherence	
		r	p	r	p	r	p	r	p
Type D personality	Anger	-0.084	0.407	-0.104	0.301	-0.297	0.003	-0.313	0.001
	Irritability	0.015	0.884	-0.090	0.375	-0.360	<0.001	-0.330	0.001
	Verbal inhibition	0.082	0.416	-0.068	0.499	-0.095	0.346	-0.091	0.368
	Social constraint	0.069	0.494	-0.039	0.697	-0.265	0.008	0.222	0.027
	Depression and anxiety	-0.066	0.511	-0.144	0.154	-0.385	<0.001	-0.382	<0.001
	Total score	0.001	0.994	0.103	0.308	-0.385	<0.001	-0.361	<0.001

Discussion:

In the present study, patients with heart failure with Type D personality had less medication adherence. This finding is consistent with the results of the Wo and Moser [2014], suggesting that D-type personality in patients with heart failure is associated with reduced medication adherence [26]. Swansedotir et al. [2012] found that heart disease patients with Type D personality had more emotional, interpersonal and psychological problems and more often followed unsafe lifestyle behaviors, showed non-adaptive behaviors in response to more stress and unwillingness to counsel with the treatment team and do not follow food and medication diet [27].

Persons with Type D personality are at risk for mental disorders and experience negative feelings such as depression, anxiety, anger, and lack of social interactions [17]. In the present study, patients with heart failure and Type D personality who had higher depression and anxiety had a weaker medication adherence. This finding was consistent with the results of Wo and Moser [2014] who showed that there is a relationship between negative affection [depression, anxiety, anger and irritability] and reduced medication adherence [26]. Boer et al. [2012] found that there was a relationship between depression and medication adherence, however there was no relationship between anxiety and medication treatment behaviors [28]. Depression may affect medication adherence through reduced motivation, cognitive disorder and energy loss, and anxiety may do it by making excitement and uneasiness in patients.

The present study revealed that heart failure patients with Type D personality with a higher social constraint had a weaker medication adherence. This finding is consistent with the results of the Schaffer et al. [2007], which reported that patients with Type D personality experienced more disease symptoms and worried more about their health but reported less their symptoms. They had not enough counseling behaviors and therapeutic communication with treatment team. These patients had poor self-care behavior adherence and worse illness.

Schaefer believes that self-control and counseling are essential for successful treatment of heart failure. Nevertheless, patients with type D personality tend to avoid social interactions. This problem is caused by the fear of being rejected by the community or fear of adverse reactions from the treatment team, resulting in a lack of self-confidence in communicating and using the avoidance-adaptive practices.

This study showed that patients with heart failure with a Type D personality having a higher anger and irritability had a weaker medication adherence. Anger and irritability are the negative affects of the patients with type D personality. Wo and Moser [2014] concluded that patients with more negative affects in Type D personality had poorer medication adherence [26]. Psychosocial problems are among the underlying factors influencing medication adherence, because they lead to the interpersonal problems and emotional distresses that can reduce the individual's ability to play social roles and receive social support and cause a person to be unable to maintain his well-being, especially medication adherence [30].

In the present study, 65% of patients had poor medication adherence. This finding is not consistent with the results of other studies. The rate of medication adherence was 75% in the study of Newonius et al. [2012] and 76% in the study conducted by Mauzari et al. [2010] [31, 32]. The difference in medication adherence between this study and other studies can be attributed to the definition of medication adherence, the methodology for evaluating medication adherence, the underlying factors, and the characteristics of the subjects.

In the present study, 75% of heart failure patients had Type D personality. This finding is not consistent with the results of some studies. The frequency of type D personality in patients with heart failure in the study of Pedersen et al. [2010] was 31.9% and in the study of Pele et al. [2009] was 20.2% [20, 19]. The observed difference in the frequency of these two studies is probably due to the type of study, the age and sex of the subjects, and the type of measurement tool and its cut-off point.

Conclusion

Patients with heart failure with Type D personality had less medication adherence. This finding supports the role of psychological factors in adherence to self-care behaviors. Screening for heart failure patients in terms of type D personality and patient referral for counseling and receiving therapies such as cognitive-behavioral therapy, social skills training, emotional support, and interpersonal psychotherapy can promote medication adherence and ultimately improve the quality of life of heart failure patients.

The findings of this study can only be generalized to patients with systolic cardiac failure and cannot be generalized to other patients. Collecting data in a cross-sectional

manner and lack of evaluation of medication adherence with objective and precise approaches rather than using the questionnaire and relying on mental data were some of the limitations of this study. Another study is suggested to be conducted to determine the effect of training interventions based on behavioral change model on the medication adherence of patients with systolic heart failure with type D personality.

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