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Original Article

Evaluation of Treatment Adherence and Illness Perception in Cardiology Patients

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Abstract

Objective: The aim of this study was to investigate the effects of the cardiology patients' illness perception on their medication adherence will guide in the development of training and consultancy strategies. **Material and Method:** The study was conducted with 110 patients who were followed up in the cardiology clinics of a university hospital. The study included patients over the age of 18 years, who agreed to participate in the study and were diagnosed with a cardiovascular disease at least six months before. The data were collected using a patient information form questioning the subjects such as the patients' age, gender, marital status and economic condition, the Illness Perception Questionnaire and the Morisky Medication Adherence Scale. **Results:** The results showed that 72.7% (*n*=80) of the group had forgotten to take their medicine, 38.2% (*n*=42) had a trouble remembering to take their medicine, 29.1% (*n*=32) stopped taking their medicine when they felt good and 32.7% (*n*=36) stopped taking their medicine because they sometimes felt bad after taking their medicine. It was determined that there was no statistically significant correlation between Morisky Medication Adherence Scale scores and Illness Perception Questionnaire subscale scores ($P>0.05$). It was determined that there was a statistically significant difference between the educational backgrounds, in terms of the personal control subscale mean scores ($P=0.003$; $P<0.01$). **Conclusion:** Patients try to explain their disease in the light of their personal experiences, knowledge, values, beliefs, and needs. Illness perception which is among the most important factors providing treatment adherence is an important factor affecting many areas from the person's psychological adaptation to the course of disease. Illness perception and treatment adherence are affected by educational level.

Keywords: *Cardiology patients, illness perception, nursing care, treatment adherence*

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Introduction

Cardiovascular diseases rank first among the causes of death in the world. Although genetic factors are important in the development of these diseases, major risk factors include smoking, high cholesterol, hypertension, low intake of vegetables and fruits, inadequate physical activity and obesity. Most of the alterable risk factors in cardiovascular diseases can be prevented with lifestyle changes. Illness perception and treatment adherence are very important in changing the lifestyle.[1,2]

In disease adjustment and treatment adherence, medication adherence is also necessary besides lifestyle changes.[3] The patients' inadequate treatment adherence causes re-hospitalisation, increases the cost of healthcare services, and affects morbidity and mortality negatively.

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The individual's illness perception and their views and perceptions on benefits or harms of medication affect their coping behaviours, as well as the course and control of treatment. In this respect, it is stated that illness perception is the most important factor affecting medication adherence.[1,4-8] In cardiology patients, they sense that the treatment has been completed may have a negative effect on medication adherence and its sustainability and worsen the situation.[6,9] Thus, determining the patient's perceptions and thoughts on the disease and providing individual training and consultancy prevent the development of new coronary cases and increase the survival rate and life quality of individuals.[10]

In the literature, there is a limited number of studies investigating the correlation between the cardiology patient's illness perception and medication adherence. In order to enable the cardiology patient's medical suggestions and medication adherence, nurses should determine the patient's illness perception and training and consultancy strategies should be developed individually in the light of the data acquired. Therefore, determining the effect of the cardiology patients' illness perception on their medication adherence will guide in the development of training and consultancy strategies.

Materials and Methods

Study design and sample

This was a cross-sectional desciriptive study conducted between July 2019 and October 2019. The study was approved by the Local Ethics Committee and conducted according to the Declaration of Helsinki. Written consent was obtained from each of the participants of the study.

The study was conducted with 110 patients who were followed-up in the cardiology clinics of a university hospital. The study included patients over the age of 18 years, who agreed to participate in the study and were diagnosed with a cardiovascular disease at least 6 months before.

Data collection

The data were collected using a patient information form questioning the subjects, such as the patient's age, gender, marital status, and economic condition, the illness perception questionnaire (IPQ) aimed at measuring their disease-related perceptions and the morisky medication adherence scale (MMAS) aimed at measuring their treatment adherence.

IPQ: The Turkish validity and reliability of the scale, which was developed by Weinmann (1996), were conducted by Kocaman *et al*. (2007).[11] IPQ consists of 3 domains as illness identity, attributions consenting the disease, and causes of disease. The domain of illness identity includes 14 most frequent disease symptoms. Concerning each symptom, the individual is first asked about "whether she/he has been experiencing the symptom since the beginning of the disease or not" and then "whether she/he has associated that symptom with her/his disease or not". Both of the questions are answered as yes/no regarding each symptom. The sum of the answers "yes" in the second question gives the evaluation result concerning the disease symptoms. If the score of the illness identity is high, it indicates that the patient strongly believes that the number of symptoms accompanying the disease is high. The domain of attributions consenting the disease consists of 38 items and uses the 5-point Likert scale. This domain consists of 7 subscales. They are named as time (acute/chronic), outcomes, personal control, treatment control, illness coherence, time (cyclical), and emotional representations. In the evaluation; high scores in the subscales of time (acute/chronic), outcomes and time (cyclical) indicate that the case is chronic, the disease outcomes are negative and the case has a cyclical nature. High scores in the subscales of personal control, treatment control, and illness coherence indicate positive beliefs concerning the personal comprehensibility of the case and controllability of the disease with treatment. High scores in the subscale of emotional representations indicate high disease-related negative emotions of individual. The domain of cause consists of 18 items including possible cause in the development of diseases and uses the 5-point Likert scale. This domain investigates the person's thoughts about the possible causes of her/his disease and consists of 4 subscales. They are psychological attributions, risk factors, immunity, accident or chance. Also at the end of the scale, the person may be asked to write down 3 factors that she/he considers the most important causes of her/his disease, for a qualitative evaluation. High scores in the dimensions of identity, outcomes, time and cyclical indicate that the disease is chronic, has negative outcomes and they also represent a strong belief concerning the number of symptoms attributed to the periodic nature of the case. High scores in the lower dimensions of personal control, treatment control, and coherence represent beliefs concerning the controllability of the disease and personal understanding of the case.[11]

Morisky Medication Adherence Scale: The scale was developed by Morisky, Gren and Levine (1986) to evaluate medication adherence of individuals with chronic illnesses briefly and accurately. The MMAS is a self-report scale consisting of four questions. The questions are answered as "yes (1 point) and no (0 point)". While 0 point is evaluated as high medication adherence; the answer "yes" (between 1 and 2 points) to one or two questions is evaluated as moderate medication adherence and the answer "yes" (between 3 and 4 points) to 3 or 4 questions is evaluated as low-medication adherence.[12,13]

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Data analysis

While evaluating the results acquired in the study, the IBM SPSS Statistics 22 (IBM SPSS, Turkey) program was used for statistical analyses. Compatibility of the variables with normal distribution was evaluated with the Kolmogorov Smirnov test, QQ diagrams and histograms. The data of the study were evaluated using descriptive statistical methods (mean, standard deviation, frequency, percentage) and the evaluation of the quantitative data between two groups were performed using the Student's *t* test. On the other hand, the quantitative data between more than two groups were assessed using the one-way analysis of variance (ANOVA). The assumption of homogeneity of the variances was tested using the Levene's test. As a result of the ANOVA test, in the determination of the groups causing the difference; those with homogenous variances were evaluated with the Tukey HSD and those with nonhomogenous variances were evaluated with the Tamhane T2 post-hoc test. Correlation between the quantitative data were evaluated using the Pearson's correlation analysis. Reliability of the scales was evaluated using the Cronbach's Alpha and Kuder Richardson-20 reliability coefficient. Significance was evaluated at the level of $P < 0.05$.

Results

When examining the sociodemographic characteristics of the patients; it was determined that their age average was 59.89 ± 14.93 years; body mass index (BMI) mean value was 26.24 ± 8.25 kg/m^2, and average number of medicines they used was 2.20 ± 1.32.

It was found that 63.6% of the patients (n = 70) were under 65 years, 65.5% (n = 72) were male, 43.6% (n = 48) had a normal weight according to BMI, 78.2% (n = 86) were married, 49.1% (n = 54) were civil servant, 62.7% (n = 69) had an income less than expenditures, 49.1% (n = 54) were primary school graduate, and 61.8% (n = 68) were using 2 and fewer drugs [Table 1].

When examining the distribution of the patient's MMAS scores, it was determined that 72.7% (n = 80) of the group had forgotten to take their medicine,

Table 1: Sociodemographic characteristics of the patients

Sociodemographic characteristics		MinMax	Mean±SD
Age (year)		1890	59.89±14.93
BMI (kg/m^2)		14.6968.62	26.24±8.25
Number of medicines used (n)		15	2.20±1.32
		n	**Perecentage**
Age group	<65 years	70	63.6
	≥65 years	40	36.4
Gender	Female	38	34.5
	Male	72	65.5
BMI class	Slim	8	7.3
	Normal weight	48	43.6
	Overweight	29	26.4
	Grade I obese	16	14.5
	Grade II obese	3	2.7
	Grade III obese	6	5.5
Marital status	Single	24	21.8
	Married	86	78.2
Occupation	Unemployed	12	10.9
	Housewife	9	8.2
	Civil servant	54	49.1
	Employee	20	18.2
	Self-employed	11	10.0
	Student	4	3.6
Income status Educational Background	Income equal to expenditures	41	37.3
	Income less than expenditures	69	62.7
	Literate	21	19.1
	Primary school graduate	54	49.1
	Secondary school graduate	20	18.2
	High school graduate	11	10.0
	Higher education graduate and↑	4	3.6
Number of drugs used	≤2	68	61.8
	>2	42	38.2

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Table 2: Distribution of the patient's MMAS scores and total score

MMAS questions	Yes	No
	n (%)	*n* (%)
1: Have you ever forgotten to take your medicine?	80 (72.7%)	30 (27.3%)
2: Do you have any trouble remembering to take your medicine?	42 (38.2%)	68 (61.8%)
3: Do you stop taking your medicine when you feel better?	32 (29.1%)	78 (70.9%)
4: If you sometimes feel bad after taking your medicine, do you stop taking your medicine?	36 (32.7%)	74 (67.3%)
	Min - Max	Mean±SD
MMAS Total	0-4	1.73±1.03
Kuder Richardson-20 reliability coefficient	0.526	

38.2% (n = 42) had a trouble remembering to take their medicine, 29.1% (n = 32) stopped taking their medicine when they felt good and 32.7% (n = 36) stopped taking their medicine because they sometimes felt bad after taking their medicine [Table 2].

When examining the patients' IPQ distributions, it was determined that the mean score of illness identity was 3.81 ± 1.94. It was found that the patients' time subscale mean score was 15.16 ± 2.76, outcomes subscale mean score was 17.81 ± 3.64, personal control subscale mean score was 21.58 ± 3.09, treatment control subscale mean score was 15.16 ± 2.76, illness coherence subscale mean score was 14.45 ± 3.74, time cycle subscale mean score was 12.93 ± 2.95, and emotional representations subscale mean score was 18.03 ± 5.09.

Table 3: Distribution of the patient's IPQ subscale scores

IPQ subscales		Item number	Score interval	MinMax	Mean±SD	Cronbach's alpha reliability coefficient
Illness identity	Disease identity number	14	014	09	3.81±1.94	*0.559
Attributions consenting the disease	Time	5	525	721	15.16±2.76	0.305
	Outcomes	6	630	1126	17.81±3.64	0.488
	Personal control	7	735	1727	21.58±3.09	0.336
	Treatment control	5	525	1125	15.16±2.76	0.316
	Illness coherence	5	525	925	14.45±3.74	0.656
	Time cyclical	4	420	517	12.93±2.95	0.699
	Emotional representations	6	630	628	18.03±5.09	0.846
Causes of disease	Psychological attributions	6	630	826	20.44±5.29	0.795
	Risk factors	7	735	1032	21.72±6.90	0.773
	Immunity	3	315	315	9.34±3.40	0.661
	Accident or chance	2	210	310	6.00±2.29	0.632

*Since the questions can be answered in two ways as yes and no, the Kuder Richardson-20 reliability coefficient was calculated

Table 4: Correlation evaluation of the MMAS and IPQ subscale scores

IPQ subscales		MMAS Total	
		r	*p*
Illness identity	Disease identity number	0.084	0.384
Attributions consenting the disease	Time	0.167	0.081
	Outcomes	0.025	0.795
	Personal control	-0.079	0.410
	Treatment control	0.112	0.242
	Illness coherence	0.001	0.993
	Time cyclical	−0.058	0.549
	Emotional representations	−0.084	0.382
Causes of disease	Psychological attributions	0.032	0.739
	Risk factors	0.060	0.533
	Immunity	0.037	0.702
	Accident or chance	0.058	0.546

r: Pearson Corelation Analysis

It was determined that the patients' psychological attributions subscale mean score was 20.44 ± 5.29; risk factors subscale mean score was 21.72 ± 6.90; immunity subscale mean score was 9.34 ± 3.40 and accident or chance subscale mean score was 6.00 ± 2.29 [Table 3].

It was determined that there was no statistically significant correlation between MMAS total scores and IPQ subscale scores ($p > 0.05$) [Table 4].

It was determined that there was no statistically significant difference between MMAS total score and IPQ subscale mean scores according to age groups ($p > 0.05$) [Table 5].

There was a significant difference between IPQ outcomes subscale mean scores according to age

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Table 5: Evaluation of MMAS and IPQ subscale scores according to age groups

Scales		Age (Year) groups		*t*	*p*
		<65 age (*n*=70) Mean±SD	≥65 age (*n*=40) Mean±SD		
MMAS total		1.66±1.08	1.85±0.95	-0.943	0.348
Illness identity	Disease identity number	3.64±1.94	4.10±1.93	1.190	0.237
	Time	14.90±2.72	15.63±2.81	1.329	0.187
	Outcomes	18.33±3.52	16.90±3.71	2.007	**0.047**
	Personal control	21.74±3.24	21.30±2.83	0.721	0.472
Attributions consenting the disease	Treatment control	14.90±2.07	15.63±3.67	1.328	0.187
	Illness coherence	14.00±3.08	15.23±4.63	1.665	0.099
	Time cyclical	12.80±3.22	13.15±2.44	0.596	0.552
	Emotional representations	18.23±4.70	17.68±5.77	0.546	0.586
	Psychological attributions	20.86±4.69	19.70±6.19	1.106	0.271
Causes of disease	Risk factors	22.10±6.47	21.05±7.64	0.766	0.445
	Immunity	9.73±3.14	8.65±3.74	1.614	0.109
	Accident or chance	6.23±2.21	5.60±2.42	1.388	0.168

t: Student *t*-Testi

Table 6: Evaluation of MMAS and IPQ subscale scores according to gender

Scales		Gender		*t*	*p*
		Female (*n*=38) Mean±SD	Male (*n*=72) Mean±SD		
MMAS Total		1.79±1.02	1.69±1.04	0.458	0.648
Illness identity	Disease identity number	4.55±1.80	3.42±1.91	**3.025**	**0.003****
	Time	15.32±2.21	15.08±3.02	0.418	0.677
	Outcomes	18.47±3.52	17.46±3.68	1.397	0.165
	Personal control	21.47±2.83	21.64±3.24	0.265	0.791
Attributions Consenting the Disease	Treatment control	15.13±2.56	15.18±2.88	0.088	0.930
	Illness coherence	14.61±3.87	14.36±3.7	0.324	0.747
	Time cyclical	12.84±3.24	12.97±2.81	0.219	0.827
	Emotional representations	18.45±5.42	17.81±4.94	0.627	0.532
	Psychological attributions	20.50±5.28	20.40±5.33	0.091	0.927
Causes of disease	Risk factors	22.11±7.12	21.51±6.82	0.426	0.671
	Immunity	9.42±3.56	9.29±3.33	0.189	0.850
	Accident or chance	6.08±2.39	5.96±2.26	0.261	0.795

t: Student *t*-Test. **$p < 0.01$

Table 7: Evaluation of the MMAS and IPQ subscale scores according to educational background

Scales		Educational background			*F*	*p*
		Primary school graduate and ↓ (*n*=21) Mean±SD	Primary school graduate (*n*=54) Mean±SD	Secondery school graduate and↑ (*n*=35) Mean±SD		
MMAS Total		1.71±1.15	1.67±0.97	1.83±1.07	0.260	0.771
Illness identity	Disease identity number	4.00±1.92	3.67±1.83	3.91±2.15	0.294	0.746
	Time	14.95±2.50	15.56±2.89	14.69±2.69	1.132	0.326
	Outcomes	18.48±4.09	16.98±3.62	18.69±3.17	2.856	0.062
	Personal control	21.90±3.30	20.63±2.73	22.86±3.07	**6.199**	**0.003****
Attributions Consenting the Disease	Treatment control	15.10±3.00	15.06±3.21	15.37±1.77	0.144	0.866
	Illness coherence	14.76±3.53	14.41±4.16	14.31±3.25	0.098	0.907
	Time cyclical	12.95±2.89	12.59±3.15	13.43±2.68	0.849	0.431
	Emotional representations	16.86±3.95	17.83±5.62	19.03±4.78	1.276	0.283
	Psychological attributions	20.76±4.91	20.41±5.71	20.29±4.96	0.054	0.948
Causes of disease	Risk factors	24.05±7.31	20.69±6.83	21.91±6.58	1.844	0.163
	Immunity	10.05±3.41	8.65±3.38	9.97±3.29	2.232	0.112
	Accident or chance	6.81±2.32	5.48±2.25	6.31±2.22	3.101	0.052

F: ANOVA Test. **$p < 0.01$

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groups ($p < 0.05$). It was determined that the women's illness identity mean score was higher than men's mean score, in a statistically significant way ($p = 0.003$; $P < 0.01$) [Table 6].

It was determined that there was a statistically significant difference between the educational backgrounds, in terms of the personal control subscale mean scores ($p = 0.003$; $P < 0.01$). As a result of the pairwise post-hoc evaluations which were performed to determine the cause of the difference, it was seen that the personal control subscale mean score was significantly high in those, who were secondary school graduates and above, than those who were primary school graduates ($p = 0.002$; $P < 0.01$) [Table 7].

Discussion

BMI mean values of the cardiology patients, who participated in the study, were above the normal weight. In the studies, majority of the patients were above the normal weight, which is similar to the results of the present study.[6,14] In addition, this can be explained with the fact that development of diseases, such as dyslipidaemia and atherosclerosis due to excessive fat storage in body poses a risk for cardiovascular diseases.

In the present study, the time (acute/chronic) subscale and emotional representations subscale mean scores were found to be high, which indicated that the patients experienced emotional symptoms intensely and believed that their illness was a lifelong disease. The fact that the personal control mean score was high can be explained with their belief that the disease could be controlled as they had compliance to the treatment suggested. In the study, it was also seen that the patients with high educational level had a higher personal control mean score than those with low-educational level, which indicated that as the patient's educational and knowledge level increased, they would have a stronger personal control concerning the disease and treatment. In the studies, it was indicated that adequate knowledge of individuals with coronary heart disease about the disease made coping easier, increased medication adherence and self-care skill and affected their reactions related to the illness positively.[15] Thus, individuals with chronic disease to control their disease, it is necessary to inform them about the disease and encourage them to make changes in their life style, involve in care actively and cooperate.[16] In the study by Gündüz and Karabulutlu (2016), it was found that the patient's emotional representations subscale mean score was the highest and the illness coherence subscale mean score was the lowest.[17] Low time (cyclical) subscale mean score can be explained by the patient's inability of perceiving how often the disease-related symptoms would recur. Similar results were also obtained in the studies on the cardiology patients.[18,19]

It was determined that the participants regarded psychological attributions and risk factors as cause of disease at higher rate. In the study by Astin *et al*., (2009), it was found that 31% of the patients regarded smoking, 31% diet-eating habits, and 10% inheritance as cause of disease.[19] In the study by Gündüz and Karabulutlu (2016), the patients mostly regarded inheritance, diet-eating habits, bad care in the past, their own behaviours, ageing, smoking and drinking alcohol as causes of disease. A similar result was also obtained in a different study.[17] In the studies, it was seen that the patients associated their disease mostly with their own habits and behaviours, which can be explained with the patients' awareness that they did not have healthy behaviours in the past. The results of the present study are compatible with the literature results.

In the study, it was seen that the patients had moderate treatment adherence. In total 72.7% of the patients gave the answer yes to the question, "Have you ever forgotten to take your medicine?". In a study conducted with patients suffering from chronic heart failure, 17% of the patients indicated that they forgot to take their medicine.[20] In a study conducted with patients who underwent percutaneous coronary intervention, it was indicated that 60.3% of the patients had no treatment adherence at all.[21] In another study conducted with the same patient group, it was indicated that the patients had moderate treatment adherence.[6] The present study shows a parallelism with the literature also in this respect.

Conclusion and Recommendations

Patients try to explain their disease in the light of their personal experiences, knowledge, values, beliefs, and needs. Illness perception which is among the most important factors providing treatment adherence is an important factor affecting many areas from the person's psychological adaptation to the course of disease. Illness perception and treatment adherence are affected by educational level. Thus, in order to encourage patient involvement which is crucial in the management of heart diseases, it is essential to determine the patient's illness perception and consider these results in the care process. In addition, it is recommended for nurses to provide training to the patients and their families to ensure their illness perception and treatment adherence in the management of heart diseases.

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Conflicts of interest

There are no conflicts of interest.

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