

## ADHERENCE TO TREATMENT IN CARDIOLOGY FROM A PSYCHOLOGICAL PERSPECTIVE

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**Abstract.** The article presents a view on the problem of adherence to treatment in cardiology: its significance, the factors that influence it, debatable issues related to the concept of adherence. New data about patients' characteristics (biological, psychosocial and psychological) influencing their adherence to treatment after coronary artery bypass surgery as a result of a medical and psychological investigation are presented. The need for an interdisciplinary approach to the problem is justified.

**Keywords:** *adherence to treatment, clinical psychology, psychological factors of adherence, coronary heart disease, coronary artery bypass grafting.*

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### 1. Introduction

The disease, according to modern theories, should be considered not only as a medical, but also as an important socio-historical and cultural phenomenon that affects both individual and collective consciousness. In some worldview systems, the disease and its antithesis – health – play a special role. The abovementioned categories affect all aspects of a person's life: physical, economic, emotional, etc.

The problem of an adequate, correct attitude of the patient towards the treatment and his behavior in the disease exists as long as practical medicine, but it is precisely in the last decades that this phenomenon goes beyond the limits of a particular medical problem and becomes global, as it is defined by the World Health Organization (WHO, 2003).

The rapidly changing world leads to the change in the pattern of morbidity, therefore the medicine advances, and its methods improve. Modern treatment of chronic diseases implicates a long intake of medicines (sometimes lifelong), as well as a change of the patient's lifestyle (in particular, certain restrictions), which are regulated by medical recommendations. Thus, the role of the patient in the treatment process becomes more relevant.

However, according to WHO, about half of patients with chronic diseases do not implement medical recommendations (WHO, 2003). This situation leads to various serious consequences.

Firstly, the medical consequences. Low adherence to therapy significantly reduces the effectiveness of treatment, a threat of aggravation in the course of the disease, especially chronic, also appears (Department of Health, 2001; WHO,

2003; Osterberg L., Blaschke T., 2005). At the same time, high adherence to treatment positively affects the survival rates of patients with chronic diseases (Simpson S.H. et al., 2006; Pogosova G.V. et al., 2007). The doctor's overestimation of patient's discipline combined with low effectiveness of treatment lead to constant revisions of therapy and prescription of other medicines.

Secondly, the social consequences. The insufficient effectiveness of treatment arouses in a patient the distrust for the professionalism of the doctor, discredits medicine and the system of medical care in his eyes (Danilov D.S., 2008).

Thirdly, the economic consequences. Non-adherence to medical prescriptions leads to the increase of the number of medical check-ups and rehospitalizations, increasing in this way the cost of treatment for both the patient and the health system in general (Department of Health, 2001; WHO, 2003).

The multidimensionality, globality and importance of the problem of adherence/non-adherence to medical prescriptions determined the emergence and development of a holistic concept, as well as the formation of special terminology (DiMatteo M.R. et al., 2002; WHO, 2003; Burrell A. et al., 2005; Cramer J.A. et al., 2008). According to the WHO definition, adherence to treatment is "the extent to which a person's behaviour – taking medication, following a diet, and/or executing lifestyle changes, corresponds with agreed recommendations from a health care provider" (WHO, 2003).

Despite the progress of technology in medicine, the high-tech methods of treatment of cardiovascular diseases (CVD) and the huge number of these interventions could not stop the epidemic of CVD, and change the leading contribution of these diseases to the structure of mortality. Performing of the direct myocardial revascularization – coronary artery bypass graft surgery (CABG) is accompanied by an improvement in the long-term prognosis and quality of life of patients (Bockeria L.A. et al., 2012). Meanwhile, the CABG among patients with coronary heart disease (CHD) does not lead to a complete cure (Panov A.V. et al., 2007). This circumstance is explained by the fact that the potential possibilities of CABG for improving the quality of life and the prognosis of patients are realized in the postoperative period (Lubinskaya E.I., 2013).

The question of the duration of treatment which leads to reduction of the risk of cardiovascular complications, is debatable, however there is some evidence that the greatest effect is provided by therapy conducted for 5 years or more (Pignone M. et al., 2000; Sever P.S. et al., 2003; Turnbull F., 2003). The problem of patients' strict follow-up of the treatment measures with its long course in modern cardiology comes to the fore.

With regard to CHD, low adherence to treatment in CHD is considered as a factor leading to therapeutic failure or patients' death. Furthermore, due to the peculiarities of the CHD treatment, adherence to treatment in these patients goes beyond adherence to pharmacotherapy, but includes a whole range of aspects – constant blood pressure control, healthy nutrition, recommended physical activity, etc.

Empirical observations, supported by prospective cohort studies, have made it possible to establish that there are more than 800 individual factor items affecting adherence to treatment (Kardas P. et al., 2013). For example, patients do not comply with medical recommendations due to underestimation of the severity of their condition, belief in the futility of treatment, the side effects of therapy, lack of confidence in the doctor's professionalism, physical incapability, the lack of means for obtaining medications.

The reasons for the patients' non-adherence to treatment can be of a different nature: clinical, psychological, social. The existing classifications of factors influencing adherence and non-adherence to treatment are based, among other things, on the meta-analysis of numerous empirical studies on the factors of non-adherence (Youssef R.M., Moubarak I.I., 2002; Jin J. et al., 2008; Mathes T. et al., 2014). However, none of the classifications distinguishes psychological factors, which could be considered as a default, because modern medicine regards the patient as a full-fledged participant in the treatment process with all his personality characteristics.

Presenting the results of a comprehensive analysis of the reasons for patients' non-adherence to medical recommendations, the WHO concludes that none of the factors reliably and unambiguously determine adherence to treatment (WHO, 2003). It should be assumed that a whole complex of divers factors, that can vary depending on the nature of the disease, its duration and prognosis, "works" for an achievement of a high level of patient's adherence to medical recommendations. Factors in different combinations can mutually strengthen or weaken the influence on adherence, but a review of recent researches revealed the absence of systematic studies of interaction and interference of these factors (Jin J. et al., 2008).

The definition of adherence to treatment as the Achilles heel of modern medicine is not an exaggeration: in chronic diseases, CVD in particular, it often becomes a predictor of an unfavorable outcome of the disease. The problem of low adherence to treatment, despite numerous attempts to solve it, remains a topicality in the complex of therapeutic and preventive measures.

Thus, the problems associated with adherence to treatment for cardiovascular diseases are extremely important, since they are directly related to the clinical outcomes of the disease. For CHD, which presents a certain difficulty with regard to its diagnosis and treatment due to the variety of forms, characterized by high rates of morbidity and mortality, it is necessary to develop and implement appropriate medical and social measures aimed at improving the current situation. The search for factors that determine adherence to treatment is an essential objective and a key to reduce risks in primary and secondary prevention, and treatment of this common and severe disease.

## **2. Empirical research**

Adherence to treatment after coronary artery bypass surgery or grafting can be an example of the strong influence of a patient's therapeutic behavior on the effectiveness of the treatment. Non-adherence to medical recommendations in the

post-operative period leads to a decrease in the surgery effect and to re-hospitalizations. Wherein, according to researchers, after CABG adherence to therapy tends to decline (Kulik A. et al., 2011). That is why understanding of adherence and its factors is essential when planning rehabilitation activities and measures among patients who underwent CABG.

### **3. Aim**

Thereby, an interdisciplinary complex research (Yeryomina D.A. et al., 2014) is being conducted at the Federal Almazov North-West Medical Research Centre (Saint-Petersburg, Russian Federation), which aims to define the relationship between the degree of adherence to treatment after CABG and various characteristics (biological, social, psychological) of patients with CHD.

The study included patients suffering from CHD who recently underwent CABG, who did not have postoperative complications or mental disorders, and expressed their informed consent to participate in the research. 103 patients have already been examined, 85 of them men and 18 women, mean age – 60,14 years (SD = 8,95). They were divided into two groups: adherent and non-adherent to therapy. All the patients were under cardiologists' observation. Adherence to therapy was assessed not earlier than three months after CABG to ensure patients' return to their usual way of life and habits. In this study, the assessment of patients' adherence to treatment was performed by an expert method, jointly by cardiologists from the Department of cardiac rehabilitation and a clinical psychologist, taking into account a whole range of patient's behavioral aspects: taking medications, keeping a diet and rejection of harmful habits such as smoking and alcohol consumption, monitoring blood pressure and regularity of medical check-ups. Those patients who regularly implement medical recommendations on medication and non-pharmacological treatment were considered to be adherent to therapy; those who failed – non-adherent. The aim of the psychological investigation also included finding out the factors that affect the degree of adherence to treatment. For this, socio-demographic, biomedical, psychological and other characteristics of patients were studied.

### **4. Results and discussion**

As a result of the study, a number of factors significantly associated with patients' adherence to therapy were identified, including biological, psychosocial, and psychological factors.

#### *Biological factors*

Using a detailed study of the patients' medical records and the results of medical examinations and testing, several biomedical parameters were taken into account; the severity of the CHD, the durability of the disease at the time of the CABG, patients' comorbid conditions and concomitant diseases, the presence of surgery related complications, etc. In the studied group of patients, only one of the

investigated parameters was statistically significant in terms of adherence to treatment.

It was found that patients from two groups – adherent and non-adherent to treatment – significantly differ in the aspect of the duration of CHD by the time of surgery ( $\chi^2 = 17,018$ ;  $p < 0,001$ ) (Table 1).

**Table 1.** Distribution of adherent and non-adherent to treatment patients after CABG on account of their clinical characteristics

Clinical characteristics	Adherent patients (n=53)		Non-adherent patients (n=50)		Total (n=103)		p
	N	%	N	%	N	%	
Duration of the CHD							
• < 1 year	3	5,66	17	34,00	20	19,41	$p < 0,001$
• 1-3 years	7	13,21	10	20,00	17	16,51	–
• 3-6 years	14	26,42	10	20,00	24	23,30	–
• > 6 years	29	54,71	13	26,0	42	40,78	$p < 0,001$

Better adherence to treatment among patients with a longer duration of CHD (more than 6 years) may be associated with the patients' successful adaptation to their disease, availability of enough time to develop new habits and adjust to a new lifestyle that takes into account their disease, and the formation of new mindsets and values. Thus, the duration of the disease, according to this study, is one of the factors associated with the degree of adherence to treatment in patients undergoing CABG. The importance of the disease duration in determining the level of adherence to treatment is also noted by some other researchers, who indicate that adherence to medical recommendations for a healthy lifestyle in the period after cardiac rehabilitation programs is reliably associated with the CHD patients' anamnesis (in particular, time of the disease manifestation, the nature and severity of the course of the disease, the methods and effectiveness of the previous treatment, etc.) (Leong J. et al., 2004).

#### *Social and psychosocial factors*

The study of patients' biography, their social status and so on, allowed to obtain data on such patients' characteristics as their educational background, marital status and dependents, employment and income level, and so on.

The consideration of demographic, socio-economic and psychosocial factors in predicting the degree of patient's adherence is of great value. Thus, it was found that the patients' employment, in particular the degree of their satisfaction with the job and with the relations in the work team ( $\chi^2 = 8,617$ ;  $p < 0,05$ ) (Table 2), the motivation to continue work after surgery due to the desire to self-actualization, self-fulfilling ( $\chi^2 = 4,719$ ;  $p < 0,05$ ) (Table 3) and due to the interest in their work ( $\chi^2 = 6,359$ ;  $p < 0,05$ ) (Table 3) are significantly associated with adherence to treatment after CABG.

**Table 2.** Distribution of adherent and non-adherent to treatment patients after CABG on account of their psychosocial characteristics (relationship with colleagues)

Psychosocial characteristics	Adherent patients (n=53)		Non-adherent patients (n=50)		Total (n=103)		<i>p</i>
	N	%	N	%	N	%	
Relations in the work team							
• good relationship, friendly terms	39	73,59	23	46,00	62	60,19	<i>p</i> <0,05
• formal relationship, neutral attitude	12	22,64	25	50,00	37	35,92	<i>p</i> <0,05
• hostile relations	2	3,77	2	4,00	4	3,89	–

Good relations among colleagues are a part of the complex phenomenon “social support”. Social support, both affective and instrumental, is considered to be a reliable predictor of better adherence to treatment, according to numerous studies (Stanton A.L., 1987; DiMatteo M.R., 2004; Escolar-Gutiérrez M.C. et al., 2014). It is worth to remark that this factor also applies to those patients who are retired, because a good fellowship at work often becomes friendly, and such support continues to be provided to the patients and felt by them even after their dismissal.

Thus, a patient with CHD satisfied with the relationships established with his colleagues, is inclined to follow medical recommendations in a greater degree.

**Table 3.** Distribution of adherent and non-adherent to treatment patients after CABG on account of their psychosocial characteristics (motivation for returning to labor activity)

Psychosocial characteristics: motivation for returning to labor activity after CABG	Adherent patients (n=33)		Non-adherent patients (n=36)		Total (n=69) <sup>1</sup>		<i>p</i>
	N	%	N	%	N	%	
Self-realization							
• yes	17	51,51	8	22,22	25	36,23	<i>p</i> <0,05
• no	16	48,49	28	77,78	44	63,77	
Interest in work							
• yes	23	69,70	14	38,89	37	53,62	<i>p</i> <0,05
• no	10	30,30	22	61,11	32	46,38	

The desire to continue active work after CABG surgery, associated with work satisfaction and personal interest in it, as well as the desire to self-actualize and to continue personal growth, may be a factor preventing the patient from violating the therapeutic regimen. The value of one's own health and the ability to lead an active lifestyle in patients increases, making the patients to take seriously the doctor's recommendations; and a significant improvement in the state of health due to the operation makes patients to appreciate the curative effect of therapeutic measures and endeavor to keep it as long as possible. Dissatisfaction

<sup>1</sup> Data on the returning to work of patients after the CABG and their motives are given only for the part of the surveyed group – 69 out of 103 – because not all the patients returned to labor activity due to retirement age. Thus, it was not possible to assess their motives and job satisfaction.

with their work as a factor of non-adherent to treatment behavior is singled out by other researchers (e.g., Strokova E.V. et al., 2012).

Thus, it is important to take into account not only the patients' demographic data – employment, job position and degree of workload – but also various psychosocial aspects, such as their degree of satisfaction with the job, motivation for returning to labor activity and further employment plans, expectations and concerns.

#### *Psychological factors*

The analysis of the factors influencing adherence to treatment in CHD patients would be incomplete without taking into account the influence of the patients' personality on their behavior in the therapy process. Psychological factors, such as patients' coping behavior, their cognitive attitudes and personality characteristics, determine to a large extent the behavior of patients and, thus, the effectiveness of the administered treatment.

At the moment, patients' suffering from cardiovascular diseases features which determine their adherence or non-adherence to treatment, are not clearly defined. However, various studies are carried out to identify and describe those factors.

Several psychological characteristics, significantly associated with adherence to treatment, were found on the same patient population (Iakovleva M.V., 2016). The findings indicate that reasonable assessment of the disease, the treatment and their own role in its course in patients after CABG is related to an adherent behavior. Patients' tendency to evaluate their condition without exaggerating its seriousness, without underestimating the severity of the illness, combined with the readiness to contribute to the success of the treatment and with a "positive reevaluation" way of coping (meaning patients try to overcome negative experiences by rethinking the past in a positive way and using it as a mean for personal growth) are factors that can be used to predict patients' good adherence to treatment after CABG.

### **3. Conclusion**

The data shows that a certain "profile" of an adherent or non-adherent patient can be defined, although it is essential to keep in mind that in each patient suffering from CVD a unique combination of various factors – medical, socioeconomic and psychological among them – determines the behavior in the therapy process, including adherence to treatment.

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