

## Behavioral Cardiology: Cardiology's New Frontier of Action

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Cardiovascular diseases are the leading cause of morbidity and mortality around the world, and particularly in Brazil, despite advances in their diagnosis and treatment<sup>1</sup>. It is speculated that these adverse events are due in part to the lack of patients' adherence to medical (pharmacological and non-pharmacological) recommendations<sup>2,3</sup>. In this regard, the evaluation of adherence and, eventually, the identification of the causes of failure in adherence are recommended to be part of the cardiovascular anamnesis<sup>4</sup>. In the study published by Oliveira-Filho et al<sup>5</sup> in the *Arquivos Brasileiros de Cardiologia* entitled "Improving Post-Discharge Medication Adherence in Patients with CVD: A Pilot Randomized Trial", the topic of adherence is approached in a randomized clinical study conducted by the authors. In this study, 61 patients diagnosed with cardiovascular disease were, upon discharge from the hospital, randomized to receive an intervention focused on education and information, including dosage simplification, and based on a 4-item adherence scale versus standard treatment. The authors compared adherence outcomes at 1 and 12 months of follow up, as well as clinical outcomes (hospital readmission and death) in the follow-up period. The adherence rate was assessed with the 8-item therapeutic adherence scale by Morisky<sup>6,7</sup>. At 1-month follow-up, the adherence rate was significantly higher in the intervention group (83.3% versus 48.4%). During long-term follow-up, the adherence rate declined to a statistically non-significant difference between groups, but remained around 61% in the intervention group. As for readmissions and deaths, there was no significant difference between groups, although the study was not designed primarily to analyze these outcomes. However, we emphasize that taking into consideration the adherent patients regardless of allocation group, the rate of clinical outcomes was lower when compared with non-adherent patients. In a recent study, Castellano et al<sup>8</sup> evaluated the polypill versus standard treatment in patients after acute myocardial infarction and observed an improvement in adherence rate, but not in cardiovascular outcomes. Dosage simplification, which was common to both studies, appears to be effective and may be a trend.

Methodologically well-planned and executed, the study by Oliveira-Filho et al<sup>5</sup> provides lessons applicable to clinical practice and to the way physicians and health

professionals interact with their patients. Patient education and simplification of dosage must be part of the strategy to improve patients' adherence. In addition, the background of this study ultimately refers to behavior. In recent years, the term "behavioral cardiology" has been used to define a new frontier of action in cardiology and currently encompasses the relationship between mental and cardiovascular health, the influence of psychosocial factors on the incidence of cardiovascular diseases, and finally, behavioral aspects of the patients that determine higher or lower adherence to medical recommendations<sup>9,10</sup>. Several behavioral theories complement each other and seek to explore the different domains that govern the behavior of a patient before a risk factor or a disease. Similarly, there are several examples in the literature demonstrating that health interventions, at an individual or population level, have a higher chance of success when based on a combination of behavioral theories, with emphasis on the health belief model, the stages of change, social cognitive theory, self-efficacy and positive reinforcement<sup>11</sup>. In all these theories, the issues of information and patient education are central.

Specifically, according to the health belief model<sup>12</sup>, the key domains that govern behavior are the perceived susceptibility to a certain risk or disease, the perceived severity of the disease, and the benefits of and barriers to a specific behavioral change. According to this theory, the first step for a patient to adhere to recommendations (whether practicing physical activity or taking a medication to prevent a cardiovascular outcome) is to notice him/herself at risk of developing the disease. The literature indicates that in this first step patients already underestimate their risk<sup>13</sup>.

In addition, the benefits of cardiovascular prevention occur in the long term, whereas the barriers to lifestyle changes are in the present. Physicians and health professionals should seek to calibrate the risk perception of the patient; in this regard, education and health information are fundamental. The patient who knows his/her disease and receives accurate information for handling the therapy tends to have greater adherence to treatment, as shown in the study by Oliveira-Filho et al<sup>5</sup>. In addition, offering information to the patient improves engagement. The behavioral theories have proposed that patient and family involvement in the treatment plan is crucial to overcome barriers and achieve the best benefits.

It is worth noting, however, that not all patients are ready to take responsibility for their treatment. The theory of stages of change<sup>14</sup> defines different stages of aptitude to change. Patients may be in the *pre-contemplative* phase, i.e., not ready for change, and in some cases, even in denial of the disease or the inherent risks. In the *contemplative* phase, patients understand the risks and accept the need for change; in the *preparation* phase, they plan effectively the action of change,

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discussing "how to execute the change"; in the *action* phase, they effectively initiate the changes; and in the *maintenance* phase, healthy attitudes become a sustainable habit. The role of the physician and other health professionals is fundamental to the advancement of the stages.

One thing useful in effecting change is to work with the patients' self-efficacy, which is self-confidence about the ability to change. To set treatment goals with positive reinforcement after fulfillment of the goals works in most cases. As an example, to establish a target of twice a week for physical activity for a sedentary patient who does not practice physical activity. Even though this is not ideal, it is achievable. When the patient achieves this goal it improves his/her self-confidence, and the positive reinforcement from the health professional improves his/her self-esteem. The next step is to define as a target thrice-a-week activity, and so on.

It is worth mentioning the importance of assessing the environment in which the patient is inserted when there is intention to promote a positive behavioral change. It is necessary to understand family, work and community cores

as essentials when planning the change. A good example is the issue of obesity. Discussing diet in this context involves the evaluation of the family, what the patient eats at work, what types of food, and at what cost it is offered in the community in which he/she lives.

We should stress that when it comes to behavior and adherence, more than a hundred factors have been identified as potential predictors of adherence, therefore one cannot expect a "one size fits all intervention"<sup>13</sup>. It is indeed fundamental to develop alternative methods to implement interventions that are effective and accessible. Additionally, it is necessary to apply technological resources as tools in the engagement and participation of the patients. Finally, in our understanding, the financing and dissemination of studies on adherence must be a priority.

Therefore, in the field of behavioral theories applied to interventions in health, the study of Oliveira-Filho et al.<sup>5</sup> brings a great contribution to current knowledge. We believe that this article will be of great usefulness to the readers of the *Arquivos Brasileiros de Cardiologia*.

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