Trends in Medicine

Review Article

ISSN: 1594-2848

# Adapted physical activity to treat chronic disease: A literature review of obstacles to prescription and compliance

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## Abstract

**Objective:** Physical activity has been correlated with a number of health benefits, to the extent that it is now considered as a therapy in its own right, in particular for chronic disease. However, the prescription of physical activity by general practitioners remains occasional, and still encounters a number of obstacles. This literature review seeks to identify these obstacles among both physicians and patients living with a chronic disease, in particular in France.

**Method:** The literature review is based on 44 retained relevant articles in peer-reviewed journals, medical theses and public health reports published in French or English between 2000 and 2020.

**Results:** For physicians, the main obstacles to prescribing adapted physical activity were lack of time during consultations, lack of training and lack of knowledge about adapted physical activity or about where to orient patients. Other obstacles included the quality of patient-practitioner relations, or the physicians' personal beliefs and practices regarding physical activity. For patients, obstacles to compliance with physical activity prescriptions included lack of time or motivation, limited access to "sport for health" programs and cultural distance from physical activity. Non-compliance also appeared as correlated with age, level of education or socio-professional category.

**Conclusion:** The results suggest several paths for improving rates of prescription and compliance with regard to adapted physical activity. These might include improving the training of physicians in this domain, developing protocols to facilitate prescription procedures, evaluating the physical condition and motivational dispositions of patients, or reducing socioeconomic inequalities which influence access to physical activity and health programs.

## Introduction

In a context of increasing medical prescriptions or recommendations of physical activity by practitioners in France, in particular as a therapy for chronic disease, our literature review focuses on the reasons for non-compliance to these prescriptions among patients with chronic diseases, but also the main obstacles for practitioners to prescribing.

### The context of compliance

According to Dr D. Yach, Executive Director of Noncommunicable Diseases and Mental Health at the World Health Organization (WHO): *"Poor compliance is the main reason why patients do not get the full benefit they could expect from their medicines. It leads to medical and psychosocial complications, decreases patients' quality of life, increases the likelihood of developing drug resistance and wastes resources"* [1,2]. According to the WHO, nearly half of all patients worldwide have poor or limited adherence to treatments. The definitions of treatment adherence and medical compliance are closely related, the former being more specifically associated with the patient's agreement to medical recommendations. The definition of adherence to long-term therapy, as retained by the WHO, is in this light defined as "the extent to which a person's behavior – taking medication, following a diet, and/or executing lifestyle changes – corresponds with agreed recommendations from a health care provider" [2]. Conversely, non-compliance is when a patient's behavior does not correspond to medical treatments as prescribed or recommended by his/her health care provider.

Non-compliance has been the subject of a large number of medical studies, the conclusions of which are various and sometimes contradictory. While in some studies social characteristics such as age, education and social status do not seem to play a significant role [3,4], more recent studies indicate that a number of variables directly impact compliance, including age, ethnic origin, socioeconomic status, sociocultural context, emotional state or beliefs [5-10]. Worries about addiction, intolerance or undesirable side effects can lead patients to refuse prescription drug treatments. According to a review of the literature on this subject: *"The synthesis revealed widespread caution about taking medicines and highlighted the lay practice of testing medicines, mainly for adverse effects. Some concerns about medicines cannot be resolved by lay evaluation, however, including worries about dependence, tolerance and addiction, the potential harm from taking*

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***Key words:** exercise referral, chronic illness, prescription, compliance, adapted physical activity, France*

**Received:** March 07, 2021; **Accepted:** March 29, 2021; **Published:** April 01, 2021

*medicines on a long-term basis and the possibility of medicines masking other symptoms"* [11].

Non-compliance also appears to be induced by the attitude of physicians, in particular when they downplay patients' autonomy or empowerment with regard to their care pathways [12,13]. A domineering or indifferent attitude of physicians can, for example, lead to resistance from the patient or reduced motivation to engage in the proposed treatment. Excluded from the decision-making process, the patient may then oppose the medical authority in order to regain a certain degree of autonomy in decision-making [14]. While the question of compliance is generally applied to prescription drugs, it also concerns *"non-drug"* therapies such as adapted physical activity (APA).

## The context in France of "sport for health" and prescribed physical activity

The benefits of regular and adapted physical activity have been known since the time of Hippocrates (460 - 377 B.C.) and *"physical exercises"* have been recommended by doctors since the 18th Century. In France, Doctor Andry de Boisregard, who later became Dean of the Faculty of Medicine in Paris, defended a thesis in 1723 on the benefits of moderate exercise for keeping healthy: *"Of all the means capable of removing and even curing a large number of infirmities to which the human body is subject, there is not one that does not give way to exercise. (...) Nothing, therefore, is more beneficial to health than moderate exercise; but this exercise, which must be proportionate to age, temperament and sex, must be placed in a certain time, and must not pass a certain measure"*.

The health benefits of regular physical activity have since been demonstrated, leading international entities to emit health recommendations regarding physical activity, such as the European Commission in 2005 [15] or the WHO in 2010 [16]. In France the French High Authority for Health later considered *"sport as a non-drug therapy"* in 2011. Much work has continued to show benefits of physical activity, whether in primary, secondary or tertiary prevention [17]. In a review of 174 articles on physical activity and the incidence of principal chronic diseases, H. H. Kyu showed that regular physical activity significantly reduced the average incidence of different illnesses: 14% for breast cancer, 21% for colon cancer, 25% for diabetes, 25% for heart disease and 26% for stroke, with effects that increase when considering the regular "dosage" of the exercise intensity [18]. International studies have also shown that a sedentary lifestyle presents its own risks, which has fortified public health efforts to promote physical activity and active lifestyles in France [19,20].

From an economic point of view, E. Avice, President of the National Council for Physical Activities and Sports, estimated that the difference in health expenditure between an active and a sedentary person was on average 250 euros per year in France in 2007 [21]. Among diabetic patients, regular physical activity could reduce the total cost of healthcare by 50% (savings of 5.2 billion euros per year). With 37 million *"sedentary"* people in France, the potential savings are 10 billion euros, or 500 million euros if only 5% of sedentary people became active [22]. These calculations are based on data (*Baromètre santé nutrition 2008*) showing that one third of French people are insufficiently physically active in terms of WHO recommendations. On a global level, the WHO estimates that 31% of adults aged 15 years and over lacked physical activity in 2008, and attributes nearly 3.2 million deaths each year to physical inactivity [23].

In France, the promotion of "sport for health" has recently accelerated, with the implementation in 2012 of a National Plan for Sport, Health and Well-being (PNSSBE) promoting physical activity and sport at all stages of life among the general population. This plan aimed to *"increase the use of non-drug therapies and develop the recommendation of physical and sports activities by doctors and other health professionals"* (Council of Ministers, October 10, 2012). An inter-ministerial circular of December 24, 2012 then required the Regional Health Agencies (ARS) and Regional Directions of Youth, Sport and Social Cohesion (DRJSCS) to create and co-pilot regional plans targeting youth, people with disabilities, patients with chronic diseases, senior citizens, or people in the workplace or in insecure socioeconomic situations. The first experimental "sport for health by prescription" program was deployed the same year, in Strasbourg, aiming to encourage the organization and practice of adapted physical activity for people living with chronic disease, and to reduce health inequalities. Over 300 general practitioners in Strasbourg formally committed to prescribe to their patients moderate and supervised adapted physical activity within this framework. Sports educators and about twenty sports associations were assigned to this program, which has since continued to expand in scope. A qualitative study carried out among the first beneficiaries of this system showed that, in addition to the physiological health benefits of physical activity, the program also favored social and psychological dimensions of health, allowing patients to exercise with confidence, motivated by group dynamics [24].

Political support for such programs has continued to grow. During the first meetings on "sport for health by prescription" (*Assises du sport santé sur ordonnance*) held in Strasbourg in October 2015, T. Braillard, Secretary of State for Sports, declared that *"we have in our hands the best medicine, which makes it possible to treat cardiovascular diseases, obesity or diabetes, but also to prevent the recurrence of cancers"*. The following year, the medical prescription of physical activity was formally written into decree (December 20, 2016) and then into law (n° 2016-41) for people living with long-term illness. This "*law for the modernization of the health system*" stipulates that: *"the attending physician may prescribe a physical activity adapted to the pathology, physical capacities and medical risk of the patient"* [25,26].

## Method

In order to explore the obstacles to prescribing or complying with adapted physical activity to treat chronic disease, we identified the scientific literature published between 2000 and 2020 using primarily Google Scholar and Pubmed. Combinations of relevant key words were used, in English and in French: sport, exercise, physical activity, prescription, compliance, non-compliance, adherence, obstacles, difficulties, doctors, practitioners, patients, chronic disease and chronic illness. Combinations included for example "obstacles prescription exercise" or "non-compliance physical activity chronic illness". The types of documents retained were medical theses (n=14), articles in peer-reviewed journals (27) and public health reports (3). We retained and analyzed the documents pertaining to the French context, as well as those most relevant to our subject, pertaining to factors of prescription of physical activity or to compliance among people living with chronic disease or long-term illness. These 44 most relevant documents were analyzed for this literature review.

## Obstacles to the medical prescription of Adapted Physical Activity (APA)

Despite the abundance of studies on the health benefits of physical activity, the literature review shows, first of all, that medical prescription of APA has yet to become a real alternative to drug therapies. A recent medical thesis citing a doctor illustrates this fact: "*We are so formatted*

*to prescribe only drugs, and patients are also formatted to leave the doctor's office with a prescription. Even now, 9 out of 10 patients leave a consultation with a drug prescription*" [27]. Drug prescriptions have a symbolic value in the eyes of the patient, as they are an integral part of culturally and socially recognized medical practices and the search for a cure. According to a pharmaceutical thesis, this medicalized vision of health, involving the use of drug therapies, represents a real obstacle to the prescription of alternative non-drug therapies [28].

The barriers to engaging in APA and sport thus concern both doctors and patients. As we shall develop further, the former do not prioritize physical activity and explain non-prescription by lack of time during consultations, lack of information or training on this subject, lack of information about APA or how and where to orient patients. The latter seem to encounter environmental, social and psychological obstacles. In a thesis on prescribed physical activity in France in 2019, difficulties were identified on several levels, concerning the individual (distance from the sites of practice), the APA programs (an insufficient number of offers or qualified instructors ; a lack of readability of APA programs), health professionals (a lack of commitment, availability or training; a lack of knowledge about existing "sport for health" offers or programs; a lack of knowledge about APA or how to prescribe it) and political support (a lack of long-term financing of "sport for health" programs) [29].

For general practitioners the obstacles are evidenced by a "*low rate of prescription of physical activities*", which "*suggests a reluctance to take part in the prescription program*" [30]. Reasons are various and include for example medical responsibility and the risk of accidents or medical complications [31]. Another reason concerns a lack of knowledge about APA, with a large majority of doctors stating that they lack knowledge in this domain [32-36]. According to the medical thesis of F. Bily, "*A very large number of physicians feel that they have received very little academic training in physical activity. (...) Many report a lack of technical knowledge when it comes to prescribing adapted physical activity to their patients*" [34]. In the case of general practitioners confronted with "sport for health" in the context of therapeutic patient education (TPE), C. Fournier *et al.* underline "*the representations of low competence, relative inefficiency and a feeling of illegitimacy in relation to these themes*" [37].

Another obstacle raised by most physicians is a lack of time. As one doctor states, as quoted in a study: "*It is difficult to find time for a systematic consultation for all patients. It is probably faster to prescribe a drug than to explain how physical activity can have a positive impact on the disease*" [38]. The tendency to promote and prescribe physical activity also depends on the personal relationship that physicians have with physical activities and sports. According to several studies in France, there is a very strong link between their own level of physical activity and the recommendation of physical activity as a means of health prevention [31,39-41]. A survey conducted by O. Bugeaud in 2019, shows that it can probably be explained by their own lack of physical activity: "*Among the general practitioners questioned, half of them declared that they had insufficient physical activity with regard to the WHO recommendations, and 15% of them were inactive*" [42].

In their work in Strasbourg, W. Gasparini and S. Knobé showed that even if the doctor might appear as central to the prescription program, the majority of prescriptions were issued upon request from patients: "*the majority of patients surveyed asked their doctor to register them in the program*" [43]. In another study on the same program, C. Marsault explains the lack of interest among practitioners by the fact that sports organization dominate the field: "*Although the beneficiaries are enrolled in the name of an illness, 'sport for health' programs are not organized around the latter. The institutional context of their implementation creates a distance from the medical context*" [44].

## Causes of non-compliance among chronically ill patients

Studies on non-compliance are relatively rare in the context of the prescription of physical activity, and patients are more difficult to identify and follow than in the context of "traditional" care pathways. The French National Institute of Health and Medical Research (Inserm) publishes regular syntheses of knowledge concerning general barriers to the practice of regular physical activity among people with chronic disease, generally focusing on contexts in European and North American countries [45,46]. Studies conducted in France are relatively rare, especially when it comes to studying the case of patients who have been given a prescription - still a recent and rare phenomenon.

The existing literature in France regarding non-compliance shows that the causes of dropout are very complex and multiple, as highlighted in particular by the work of C. Perrin and colleagues [47,48]. In a currently unpublished manuscript, S. Knobé recently synthesized the literature and studied the logics of engagement in "sport for health" activities in France. Her work underscores the role of personal histories and living conditions, focusing on the evolving relations between health norms, social dispositions, living conditions and specific personal and health situations. In the context of a thesis relating to type 2 diabetes, N. Barth stressed that a reversal in commitment to adapted physical activity frequently stems from a modification of the illness trajectory [49], whether related to fatigue, physical limitations, contraindications related to evolutions in the illness or even hospitalization. This observation coincides with results from a study in France related to cardiovascular illnesses, in which "dropouts" were also associated with lack of time or lack of interest in the activities or the intensity of physical activity proposed by the program [50].

In the international literature, one study showed that a quarter of studies on non-compliance are devoted to cardiovascular illnesses, and that a significant proportion of cardiac patients do not follow the recommendations of health professionals regarding APA [51]. The dropout rate during exercise rehabilitation programs, even when part of the care pathway, remains very high, and patients tend to stop physical activity at the end of the rehabilitation program [52]. In a study in Glasgow regarding engagement in cardiac rehabilitation programs proposed to people with cardiovascular illnesses, over two thirds of eligible patients did not register for or adhere to the program [53]. Non-compliance with physical activity recommendations has been related to many contextual factors in the international literature. The physical accessibility of "sport for health" programs is a recurring factor, related to questions of transportation, place of residence and the placement of sport infrastructures [54-57]. In terms of sociodemographic factors, the literature shows correlations with level of education, socioeconomic conditions, socio-professional status, age or gender [58-62]. The cost and placement of activities are therefore key elements of compliance. In their work to evaluate the French "sport for health by prescription" program in Strasbourg, W. Gasparini *et al.* underscored the economic vulnerability of the participants as well as their place of residence, the physical distance from programs compounding the cultural distance from the world of sport [63].

The age of patients is also a determining factor of compliance to such recommendations, with patients over 65 being most likely to not adhere to APA recommendations or programs [64,65]. For many older patients, physical activity is limited to utilitarian functions, such as walking, housework or gardening. Lack of motivation or fear of the

difficulties associated with physical activity have often been identified as major obstacles to taking up APA [66]. Numerous studies point to an overall low level of interest in physical activity among the elderly, but also stress and other psychological barriers, including fear of falling, medical complications or lack of confidence [67,68]. Lack of time or interest are also considered by general practitioners to be the major obstacles for older patients to engage in APA [69].

Lastly, studies in the field of psychology have long dealt with motivational barriers to physical activity. In one study specific to engagement in "sport for health" programs, J. Boiché and P. Sarrazin showed that "self-determined motivation", anchored in the individual's personal goals, increased long-term commitment to exercise programs, enabling participants to overcome the "lack of time" barrier by rendering the activity a priority on par with other obligations such as work or family [70].

## Conclusion

The principal objective of "sport for health" programs is *"to convert the person's lifestyle into a physically active one*", in order to normalize health norms and to achieve public health objectives [48]. The recent emergence of prescribed adapted physical activity programs represents hope for the future in terms of its promised health benefits, but the sector remains fragile, fragmented, and little known. This literature review has shown how prescribed physical activity is still a field in construction, constituted by various actors who propose endless variations of "sport for health" offers within the fuzzy frontiers of the field.

Despite the many initiatives to promote adapted physical activity and improve the health of people affected by chronic disease or long-term illness, many obstacles remain. Public authorities in France had predicted obstacles emanating from the field of sports, historically focused on performance and competition. But the obstacles within the medical field as identified in this literature review, relating to practitioners and patients, have yet to be sufficiently anticipated by policies. The prescription of adapted physical activity has yet to be anchored in medical practices or training, or patient expectations.

Many of the obstacles addressed throughout this literature review can be lifted over time. The results suggest different avenues for eliminating such obstacles, and implementing new policies, programs and practices which address them. Changes might include improving the training of physicians, developing protocols to facilitate prescription procedures, evaluating the physical condition and motivational dispositions of patients, or reducing socioeconomic inequalities which influence access to physical activity and "sport for health" programs.

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