

Promotion of physical activity in patients with non-communicable diseases in Luxembourg: a follow-up of the Sport-Santé inventory from 2014

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Keywords:

physical activity, sport, lifestyle, prevention, chronic diseases.

Abstract

Regular practice of physical activity (PA) has many health benefits in both healthy individuals and in people with non-communicable diseases (NCDs). In order to disseminate this evidence and to strengthen the promotion of PA in people with NCDs, the Sport-Santé project was created in Luxembourg and officially launched in April 2015. In 2014, a stocktaking of the different organizations offering PA for people with NCDs was realized in order to develop the Sport-Santé project. Different communication tools were used to promote Sport-Santé as well as the aforementioned organizations. The present study aimed to re-evaluate the offers of PA for people with NCDs in Luxembourg one year after the launch of the project.

The organizations offering PA for people with NCDs (orthopaedics, obesity and overweight, neurology and rare diseases, oncology and cardiology) were screened in 2014 and in 2016. The number of weekly offered hours of PA for people with NCDs were collected and the participation rate was observed. Participants (192 in 2014 and 196 in 2016) volunteered to answer a survey, which contained questions regarding their age, sex, time since enrolment, travel distance, former and current PA participation, and type of recruitment. Additional items regarding prescription and refund were explored only in 2016.

In 2016, more than 55 hours per week of PA were offered for people with NCDs in Luxembourg (≈ 44 hours per week were identified in 2014). However, this increase was not statistically significant. No difference was observed between 2014 and 2016 regarding the participation rate (2014: 8.9 ± 5.1 participants per hour; 2016: 8.4 ± 5.7 participants per hour). Participants were younger in 2016 than in 2014. The time since enrolment was shorter in 2016 than in 2014. No difference between 2014 and 2016 was observed for travel distance, sex distribution, former and current PA participation, and type of recruitment. Participants were mainly recruited by the healthcare professionals. More than 69 % of the participants would like to receive a medical prescription for the PA. Fifty-two percent of the participants would appreciate a refund of the participation fees by their health insurance.

The increasing efforts of Sport-Santé and the organizations offering PA for people with NCDs lead to increase the offer. However, the participation rate remains unchanged. The decrease in age and in time since enrolment observed in 2016 could be explained by the creation of new activities, a larger participant's turnover or high number of withdrawals among long-term participants. Even if participants are mainly recruited by healthcare professionals, this type of recruitment can be attributed to very few idealists. All healthcare professionals should be aware of the offers of Sport-Santé and advise their patients to participate in a PA program. It is now time to advance the idea of prescription of PA as a privileged treatment option and to convince the policymakers to take action against sedentary behaviours in Luxembourg. Nevertheless, this type of promotion is not enough to increase the

number of participants and additional strategies must be explored and developed. The best sustainable strategies are always those that approach the problem from different viewpoints.

Introduction

Physical inactivity is one of the most important risk factors for non-communicable diseases (NCDs) [1-6]. NCDs include, but are not limited to, cardiovascular and chronic respiratory diseases, cancer, stroke and diabetes, and represent the leading cause of death in the world. Physical inactivity, which can be related directly and indirectly to other risk factors for NCDs (e.g. hypertension, smoking, hyperglycemia, overweight and obesity), induces more than 5 million deaths per year worldwide [1, 3, 4, 6]. This probably underestimated number of deaths must be prevented with behavioral changes. Premature death can be prevented by the decrease of physical inactivity [7]. Indeed, a decrease by 10% in physical inactivity will avert up to 1.3 million deaths per year and reduce the risk of premature death [6].

Physical activity (PA) is not only beneficial in terms of primary prevention of NCDs (e.g. weight control, lower risk for coronary heart disease, stroke, diabetes, hypertension, depression, colon and breast cancer etc.), but is also suitable in the context of already patent diseases (i.e. secondary and tertiary prevention). Indeed, it has a positive influence on the structures and functions of the body, on the course of disease and the relapse rate [3, 8]. People with NCDs can avoid the disease-related decrease of their quality of life by being more physically active. The increase in PA, combined with other behavioral changes (smoking cessation, decrease in alcohol consumption, healthier nutrition), can even contribute to an increase in life expectancy in people with NCDs [9]. Reduced exercise capacity is one of the most powerful predictors of mortality [10]. Indeed, studies demonstrated that a low cardiorespiratory fitness has a much worse impact on morbidity and mortality than smoking or obesity [2, 11]. Thus, despite the fact that obesity is a risk factor for NCDs per se, moderately fit obese persons have about half the mortality risk than normal-weighted unfit persons [11]. In patients with cardiovascular diseases (e.g. State after myocardial infarction), PA improves cardiac performance due to exercise-induced compensation mechanisms of the heart (e.g. increase of cardiac stroke volume, ejection fraction, improvement of the coronary circulation, etc.) and the vessels (endothelial function) [8, 12]. In cancer patients, PA reduces fatigue, anxiety and depression. In people with Parkinson's disease it improves mobility, coordination and reduces rigidity [8, 13-15].

The Sport-Santé project was created in Luxembourg in order to increase public awareness of the benefits of PA as a therapeutic adjuvant (i.e. disease specific recommendations for PA) and a means for health protection after an accident, as well as in secondary prevention of NCDs (i.e. cardiology, neurology and rare diseases, overweight and obesity, oncology, and orthopedics) [16]. With this idea

in mind, an inventory of the offers of targeted PA for people with NCDs was completed in 2014 [17]. This inventory highlighted that the participation rate was low and has potential to be improved. Different communication tools (website, posters, flyers, booths) were therefore developed and disseminated to inform specific stakeholders and the population about the existence of these targeted offers. The Sport-Santé project and its website were officially launched in April 2015. Our study aimed to re-evaluate the offers of PA for people with non-communicable diseases in Luxembourg one year after the launch of the project.

Materials and methods

Concerning the Sport-Santé project, the organizations offering PA for people with NCDs which were identified in 2014 [17] were re-evaluated in 2016. In addition, new organizations were identified in 2016 and one organization identified in 2014 wished to withdraw from the Sport-Santé project. The organizations are presented on the website www.sport-sante.lu [16] and have been classified into five categories: orthopaedics, obesity and overweight, neurology and rare diseases, oncology, and cardiology (Table 1).

Table 1. List of the observed groups offering PA for people with NCDs in 2014 and 2016.

Pathology	Association	2014	2016
Orthopaedics	1. Luxemburger Hüft- und Kniesportgruppe	✓	✓
	1st Return-to-Sports Group Luxembourg	x	✓
	Gesond Diddeleng	x	x
	Ligue luxembourgeoise contre le rhumatisme	✓	x
Obesity and overweight	Groupe Sportif Pour Adultes en Surpoids	✓	✓
	Groupe Sportif Pour Adolescents en Surpoids	x	✓
	Movin' Kids	✓	✓
	Gesond Diddeleng	x	x
Neurology and rares diseases	Parkinson Luxembourg	✓	✓
	Blëtz	x	x
	Multiple Sclérose Lëtzebuerg	✓	✓
	ALAN Maladies Rares	✓	✓
Oncology	Fondation Cancer	✓	✓
	Association Luxembourgeoise des Groupes Sportifs Oncologiques	✓	✓
	Europa Donna Luxembourg	✓	✓
Cardiology	Association Luxembourgeoise des Groupes Sportifs pour Cardiaques	✓	✓

✓: investigated group; x: group not investigated.

The number of weekly offered hours of PA for people with NCDs was collected. In addition, the participation rate (i.e. number of participants per hour) was observed once in each category. During the periods from September 2013 to April 2014 and from February 2016 to March 2016, 192 (in 2014) and 196 (in 2016) participants volunteered to answer an anonymous questionnaire (Table 2) regarding their age, sex, time since enrolment (i.e. period of participation in the group), travel distance from home to sport facilities, former and current PA

participation and type of recruitment (healthcare professionals – i.e. medical doctors and allied health professionals – , family and friends, media and associations) [17]. In addition, the 2016 surveys included new items regarding the knowledge of the Sport-Santé project and whether participants would appreciate a medical prescription and/or a refund of the participation fees by their health insurance.

Table 2. Interviewed participants.

	2014	2016
	n (%)	n (%)
Orthopaedics	28 (14.6)	23 (11.7)
Obesity and overweight	17 (8.9)	35 (17.9)
Neurology and rare diseases	25 (13.0)	40 (20.4)
Oncology	46 (23.9)	36 (18.4)
Cardiology	76 (39.6)	62 (31.6)
Total	192 (100)	196 (100)

The data collected from 2014 were compared with those collected in 2016. Quantitative variables were expressed as mean and standard deviation (SD), and were compared by using Student’s t-tests. The qualitative variables were expressed by number (n) and percentage (%) and were compared using the χ^2 -test. A 0.05 P-level of significance was set.

Results

In 2016, more than 55 hours of PA per week were offered for people with NCDs in Luxembourg (Figure 1). Compared to 2014, more than 11 hours of PA were new and resulted from the creation of new groups and activities. However, this increase was not statistically significant ($t = 2.53$, $P = 0.06$). In addition, no difference was observed between 2014 and 2016 regarding the average number of participants per hour (Figure 2). However, the participation rate dropped significantly in orthopaedics ($t = 6.98$, $P < 0.001$).

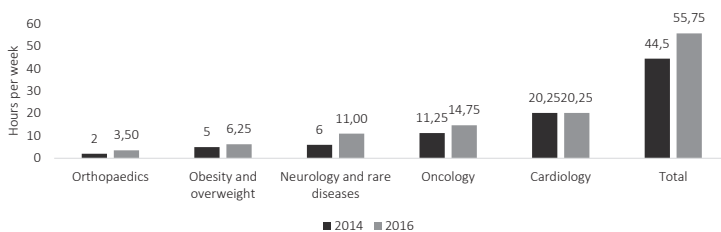


Figure 1. Number of hours per week of PA offered in 2014 and in 2016 for people with NCDs in Luxembourg.

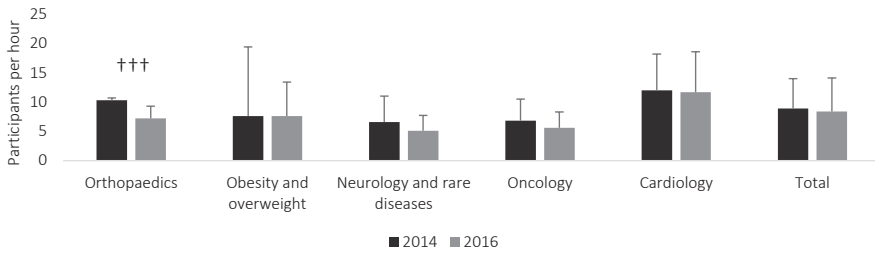


Figure 2. Means (and standard deviations) of the participation rates observed in the five categories offering PA for people with NCDs in 2014 (black bars) and 2016 (grey bars). †††: $P < 0.001$.

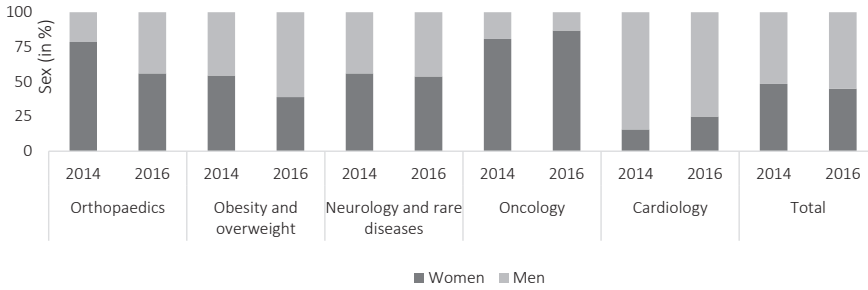


Figure 3. Sex distribution (dark grey bars: women; light grey bars: men) observed in the five categories offering PA for people with NCDs in 2014 and 2016.

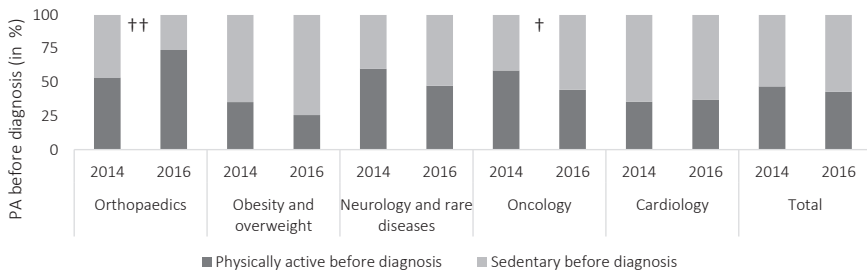


Figure 4. PA before diagnosis (dark grey bars: physically active before diagnosis; light grey bars: sedentary before diagnosis) observed in the five categories offering PA for people with NCDs in 2014 and 2016. †: $P < 0.05$, ††: $P < 0.01$.

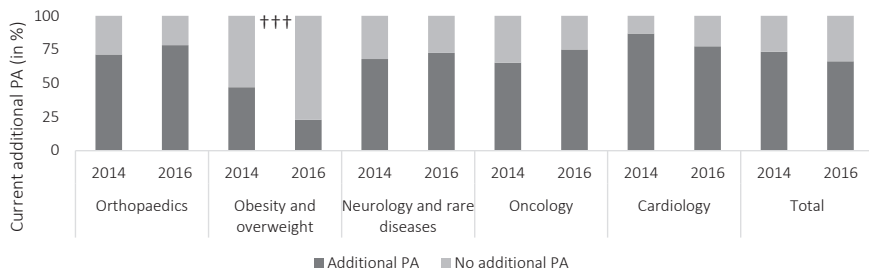


Figure 5. Current additional PA (dark grey bars: additional PA; light grey bars: no additional PA) observed in the five categories offering PA for people with NCDs in 2014 and 2016. +++: $P < 0.001$.

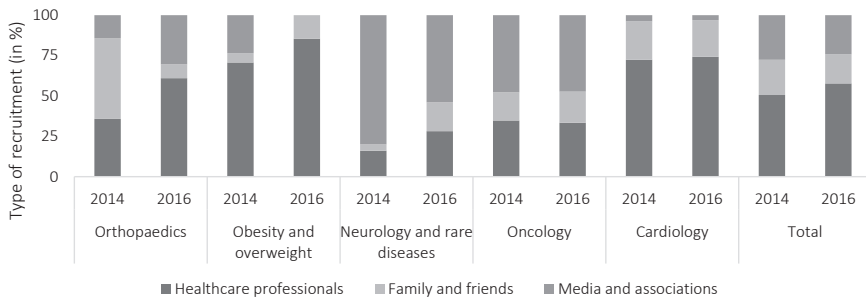


Figure 6. Type of recruitment (healthcare professionals, family and friends, media and associations) observed in the five categories offering PA for people with NCDs in 2014 and 2016. ††: $P < 0.01$ for family and friends, ‡: $P < 0.05$ for the media and associations, ‡‡: for the media and associations.

Table 3. Age, time since enrolment and travel distance (from home to sport facilities) observed in 2014 and 2016.

	2014		2016		t-test	
	Mean (SD)	Mean (SD)	t	P		
Age	Orthopaedics	68.6 (8.7)	53.1 (17.1)	3.95	< 0.001	
	Obesity and overweight	16.7 (3.9)	19.0 (14.5)	-0.87	0.38	
	Neurology and rare diseases	45.9 (8.8)	58.6 (21.3)	-3.34	0.002	
	Oncology	59.4 (8.7)	58.6 (9.7)	0.39	0.70	
	Cardiology	6.3 (8.6)	65.3 (9.2)	0.65	0.51	
	Total	58.2 (8.3)	53.2 (21.6)	3.02	0.003	
Time since	Orthopaedics	5.8 (4.5)	3.7 (3.8)	1.81	0.08	
	Obesity and overweight	1.4 (0.5)	1.7 (1.3)	-1.19	0.24	
	Neurology and rare diseases	2.3 (1.2)	2.1 (2.0)	0.50	0.62	
	Oncology	3.6 (2.4)	4.0 (3.9)	-0.54	0.59	
	Cardiology	7.8 (5.3)	6.8 (6.7)	0.96	0.34	
	Total	5.3 (3.6)	4.0 (4.9)	3.00	0.003	
Distance	Orthopaedics	17.0 (8.9)	19.23 (10.3)	-0.81	0.42	
	Obesity and overweight	3.8 (3.6)	10.75 (4.4)	-6.05	< 0.001	
	Neurology and rare diseases	15.9 (8.8)	17.12 (9.5)	-0.53	0.60	
	Oncology	16.9 (8.7)	15.85 (8.0)	0.57	0.57	
	Cardiology	8.6 (5.8)	8.96 (6.4)	-0.34	0.73	
	Total	12.2 (7.1)	12.92 (10.7)	-0.78	0.44	

Table 3 shows the difference between 2014 and 2016 concerning age, time since enrolment and travel distance. Participants were younger in 2016 than in 2014, especially in Orthopaedics. In contrast, participants with neurologic and rare diseases were older in 2016 than in 2014. The time since enrolment (i.e. period of participation in the group) was shorter in 2016 than in 2014. Overall, no difference was observed between 2014 and 2016 for travel distance. However, the participants of the category obesity and overweight covered a significantly higher travel distance to take part in the PA in 2016 compared to 2014. The sex distribution was not different between 2014 and 2016 (Figure 3). Women were overrepresented in oncology and underrepresented in cardiology.

In general, the participants of the different groups were mainly sedentary before the diagnosis of their disease, especially in cardiology and in obesity and overweight (Figure 4). Overall, no difference was observed here between 2016 and 2014. However, more participants were sedentary before diagnosis of cancer in 2016 than in 2014 ($\chi^2 = 4.09$, $P = 0.043$). More participants in orthopaedics were active before their pathology in 2016 than in 2014 ($\chi^2 = 8.92$, $P = 0.003$). In 2016, more than 66 % of the participants were doing additional PA (Figure 5). This percentage remained stable compared to 2014. However, the percentage decreased significantly in 2016 for the obesity and overweight group ($\chi^2 = 12.87$, $P < 0.001$).

The type of recruitment is presented in Figure 6. Participants were mainly recruited by the healthcare professionals, especially in orthopaedics, cardiology as well as in obesity and overweight. Overall, the type of recruitment has not changed between 2014 and 2016. However, the participants in orthopaedics were referred less often by their family and friends in 2016 than in 2014 ($\chi^2 = 10.00$, $P = 0.002$). Media and/or associations did not lead to recruit any participant in the obesity and overweight groups in 2016 ($\chi^2 = 8.68$, $P = 0.003$). However, even if media and associations were the predominant type of recruitment in neurologic or rare diseases group, it led to recruit less participants in 2016 than in 2014 ($\chi^2 = 4.52$, $P = 0.002$).

Finally, 69 % of the participants would appreciate to receive a medical prescription for PA. The percentage was 83 % in orthopaedics, 67 % in obesity and overweight, 55 % in neurology and rare diseases, 64 % in oncology and 77 % in cardiology. In addition, 52 % of the participants would welcome a refund of the participation fees by their health insurance. The percentage was 70 % in orthopaedics, 73 % in obesity and overweight, 62 % in neurology and rare diseases, 55 % in oncology and 31 % in cardiology.

Discussion

Our study aimed to re-evaluate the different groups offering PA for people with non-communicable diseases in Luxembourg one year after the launch of the Sport-Santé project. Between 2014 and 2016, more than 11 hours per week of new PA have been created by the different organizations in orthopaedics, obesity and overweight, neurology and rare diseases, as well as in oncology. In total, more than 55 hours per week of PA are available for patients with NCDs. The Sport-Santé project may have partly contributed to the creation of these new activities.

One of the aims of Sport-Santé was to help the different organizations to increase the number of participants. The absolute participation may have increased as the number of hours per week of PA also has increased. Nevertheless, the participation rate, which should be doubled [17], did not change between 2014 and 2016. Since the launch of Sport-Santé and its website, several communications were realized to promote the project and the different groups. In fact, 13 articles have been published in local specialized journals that were distributed in hospitals [18], pharmacies [19], associated federations of the Luxembourgish Olympic committee [20], medical doctors [21], and within the different organizations which offer the PA [22-24]. These articles explained the positive effects of PA in the management of NCDs. Some of them only focused on a specific disease and included testimonials of active patients (e.g. cancer, Parkinson's disease, cardiovascular diseases [22-24]). In addition, Sport-Santé was presented at ten different events across the country with a booth in order to promote the different organizations which offer PA in people with NCDs. Finally, Sport-Santé was introduced to the physiotherapy units of the Luxembourgish hospitals. This communication strategy, which is necessary to increase the awareness of Sport-Santé, could be upgraded and developed to better reach the medical doctors and the general population.

Participants were younger in 2016 than in 2014, especially in Orthopaedics. This result can be explained by the creation of the 1st Return-to-Sports Group Luxembourg which is mainly composed by young injured adults aiming to return to play. In contrast, participants with neurologic and rare diseases were older in 2016. The results may also suggest that there is a larger turnover in the orthopaedic group compared to the neurologic and rare disease group. The time since enrolment was shorter in 2016 than in 2014. On one hand this difference may be due to the enrolment of new people with a recent disease and, on the other hand, it could be the result of a high number of withdrawals among long-term participants. It could also be the result of the youth of the 1st Return-to-Sports Group Luxembourg which has been launched recently. Patients who were the least active before their diagnosis were those from the

cardiology and the obesity and overweight groups. Physical inactivity is known as a strong risk factor for these conditions [6, 25, 26]. Therefore, healthcare professionals (medical doctors, physiotherapists, nurses, etc.) should encourage their patients to engage in a long-term PA program. However, different studies indicate that the majority of patients does not increase PA after the diagnosis of NCDs [27, 28]. The type of recruitment did not change between 2014 and 2016. PA was recommended by healthcare professionals (i.e. medical doctors and allied health professionals) for more than 57 % of the participants. This percentage increased to 85 % in the obesity and overweight category. The increase in the numbers of healthcare professionals counselling their patients to be more active must be targeted. Healthcare professionals must promote more PA as it protects the health of their patients and the general population [29]. Moreover, they have a responsibility since patients are inclined to follow their recommendations. Therefore, healthcare professionals are one of the most reliable ways to promote PA in patients with NCDs. The PA status of the patient should be evaluated at every consultation and, if necessary, additional advice provided. A failed inclusion of the promotion of PA during a consultation is even considered by some as a medical neglect [30]. However, medical doctors often hesitate to prescribe PA for different reasons: lack of reimbursement, own exercise habits, lack of time, overestimation of the adverse effects of the PA, fear of litigation and limited knowledge [31]. In our study, more than 69 % of the participants believed that a medical prescription would be suitable for the participation in the PA. More than half of the participants would appreciate a refund of the participation fees, the lowest percentage being observed in the cardiology group which is supported by the Ministry of Health. The prescription could be an appropriate tool to help raising the number of participants. However, PA is not yet recognized as a treatment option in Luxembourg and is not reimbursed by the Luxembourgish National Health Fund. In Luxembourg, as in many other countries [32], PA is therefore underprescribed.

In Luxembourg, some efforts are currently made (e.g. the national action plan “Gesond iessen – méi bewegen”) but do not specifically target individuals with NCDs. However, the government bodies should engage more actively in the promotion of PA by providing health-related information to health professionals and whole communities. Efficient use of advocacy and communication to convince more people of the positive effects of PA on health, especially in people with NCDs, is required. Advocacy, defined as “the combination of individual and social actions designed to gain political commitment, policy support, social acceptance and systems support, for a particular health goal or program” [34] is currently growing in Luxembourg. This is illustrated through initiatives such as the Sport-Santé project, different organizations offering PA for people with NCDs, the recently created Fédération Luxembourgeoise des Associations de Sport de Santé, membership of the Luxembourg Institute of

Health at the HEPA Europe network, etc. [35]. Indeed, the communication of the associations (press, internet, radio, TV, booths, etc.) was, in our study, the main type of recruitment in oncology and rare diseases. However, other partners (e.g. community workers, health professionals, non-health sector, non-government sectors, academics and general community) should join the advocacy to encourage policymakers to invest in order to decrease the sedentary behaviours, especially in people with NCDs [33]. In addition, the communication strategy should target professionals and general community to promote the different actions to increase PA. Other approaches, such as exercise-referral schemes or financial-incentive schemes, could be implemented to raise the number of participants [36]. All sustainable strategies (e.g. training for healthcare professionals) tackling problem in many ways are necessary [37]. Finally, interventions aiming to increase PA participation have been demonstrated to be cost-effective for society [38, 39]. Indeed, brief advices delivered by healthcare professionals increase PA in adults at a reasonable cost [39]. This strong argument must help the policymakers to enhance the promotion of PA, which is moreover recommended by the Regional Office for Europe of the World Health Organization [40].

In conclusion, the offer of PA for people with NCDs is increasing in Luxembourg. However, the current efforts must be sustained by all the stakeholders. In addition, advocacy and governmental communication must be developed to increase the participation rate and to decrease the sedentary behaviours. The prescription of PA must be raised at a national level.

Acknowledgments

This study was supported by the Œuvre Nationale de Secours Grande-Duchesse Charlotte. The authors are grateful to the persons in charge of the different organizations offering PA for people with NCDs for their supports.

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