

# A survey of exercise beliefs among people with Parkinson's disease in Malaysia

DOI: <https://doi.org/10.5114/pq.2021.103556>

Alfonsa Choo Kher Ying<sup>1</sup>, Rajkumar Krishnan Vasanthi<sup>2</sup> 

<sup>1</sup> B.E.N. Physio, Kuala Lumpur, Malaysia

<sup>2</sup> Faculty of Health and Life Sciences, INTI International University, Nilai, Malaysia

## Abstract

**Introduction.** A substantial amount of evidence supports exercise as crucial non-pharmacological management to slow down the progression of Parkinson's disease. Despite that, people with Parkinson's disease are still known to be physically inactive. Hence, there is a need to investigate the exercise beliefs and participation benefits so that strategies can be developed to improve their exercise involvement.

**Methods.** Overall, 47 respondents from a non-governmental organization who met the inclusion criteria were recruited purposively to determine their beliefs concerning exercise. A cross-sectional survey was conducted with the use of a self-administered and validated questionnaire.

**Results.** A significant proportion of the participants (80.9%) believed that exercise could help slow down the progression of Parkinson's disease; 17% were not sure and only 2.1% answered that exercise did not slow down the disease progression. The majority of the subjects (68%) were more likely to believe that exercise improved balance. Pertaining to the belief in physiotherapy for people with Parkinson's disease, 76.6% answered yes, 17% were not sure, and 6.4% said that they did not believe in physiotherapy for people with Parkinson's disease.

**Conclusions.** The study revealed that most participants believed in exercise and were aware of its usefulness for their condition. However, they also reported that exercise and physiotherapy were not routinely recommended to them. So, still, awareness is needed of the exercise role and participation benefits.

**Key words:** exercise, beliefs, Parkinson's disease

## Introduction

Parkinson's disease (PD) is a progressive neurodegenerative disease that affects multiple systems of the body, mainly in the later years of life [1]. PD is known to be the second most common neurodegenerative disorder worldwide [2]. The Global Burden of Disease Study reported that the global burden of PD had increased 2.4 times to over 6 million, with longer disease duration and environmental factors being potential contributors. The prevalence and incidence of PD is stated to be higher in middle and low Socio-Demographic Index countries [3].

Disruption of the serotonergic, noradrenergic, and cholinergic systems in PD is also associated with non-motor symptoms [4]. These can include cognitive dysfunction, cognitive impairment, psychiatric symptoms, sleep disorders, autonomic dysfunction, incontinence, pain, and fatigue [5]. According to previous studies, both motor and non-motor symptoms can negatively influence the quality of life in PD patients [6, 7]. Currently, encouraging exercise has become an essential part of PD management in adjunct to pharmacological and surgical treatment [8]. Numerous studies have shown that exercise is effective in improving physical functioning, health-related quality of life, leg strength, balance, and gait, as well as in preventing falls in people with PD [9, 10]. Besides, a systematic review also reported that exercise could alleviate non-motor symptoms, such as depression, apathy, fatigue, or cognition and sleep disorders [11]. Furthermore, physical activity has also been shown to increase brain-derived neurotrophic factor blood levels in people with PD,

which promotes survival and growth of neurons in the substantia nigra pars compacta and recovery of motor behaviour [12].

Despite the immense amount of evidence supporting the benefits of exercise for people with PD, a cohort study revealed that the PD subjects were 29% less active than the healthy general population [13]. The National Parkinson Foundation Quality Improvement Initiative registry indicated that 53% of the PD patients did not exercise regularly and were characterized by lower quality of life, reduced physical function, worsening of the disease, and increased caregiver burden. A relationship between beliefs and the practice of preventive health behaviours, including exercise, has been shown in various studies, particularly research based on the Health Belief Model [14]. High exercisers were more likely to believe that there was scientific evidence that exercise could potentially slow the disease progression; they also had better knowledge regarding the benefits of exercise [15].

The findings of prior studies may not be applicable to the Malaysian context because the exercise beliefs may vary owing to differences in the socioeconomic conditions, culture, environment, and healthcare structures in Malaysia compared with the developed countries. These differences may lead to varied life experiences, mindsets, challenges, and even provision of physiotherapy services, which can influence exercise beliefs. Exercise beliefs exert a significant effect; they can either encourage or inhibit exercise participation. Many researchers, however, maintain that exercises positively influence physical fitness, general wellbeing, and even independence in old age. Hence, the purpose of this study

*Correspondence address:* Rajkumar Krishnan Vasanthi, Faculty of Health and Life Sciences, INTI International University, Persiaran Perdana BBN, Putra Nilai, 71800 Nilai, Negeri Sembilan, Malaysia, e-mail: [rajkumar.krishnan@newinti.edu.my](mailto:rajkumar.krishnan@newinti.edu.my)

Received: 10.05.2020

Accepted: 14.09.2020

*Citation:* Ying ACK, Vasanthi RK. A survey of exercise beliefs among people with Parkinson's disease in Malaysia. *Physiother Quart.* 2022; 30(3):57–63; doi: <https://doi.org/10.5114/pq.2021.103556>.

was to examine exercise beliefs in people with PD in the Malaysian context. By identifying the exercise beliefs in this population, awareness can be created to maximize adherence by tailoring effective, relevant, and acceptable intervention programs for PD patients.

## Subjects and methods

### Study design

A cross-sectional survey was undertaken purposively among 47 people with PD. The inclusion criteria were as follows: (1) idiopathic PD, (2) being aware of having PD, (3) age of 80 years or below, (4) not having any severe cognitive impairments (Mini-Cog score of 3 or more). Subjects with PD who (1) had an unconfirmed diagnosis of PD or (2) suffered from other chronic conditions that could cause severe disability (e.g. stroke) were excluded from the study.

### Tools and procedure

The self-developed survey consisted of 8 multiple-choice questions relevant to exercise beliefs (Appendix). Subjects aged 80 years or less who had idiopathic PD and were aware of it were administered a short cognitive test (Mini-Cog) to ensure that they did not have severe cognitive impairments. Those who scored 3 or more in the Mini-Cog test were invited to participate in the research. They were then given a brief explanation regarding the purpose of the research and instructions on how to complete the questionnaire. Once the participants had completed the questionnaire, data were collected and analysed (Figure 1).

### Statistical analysis

Statistical analysis was carried out by using Microsoft Excel to summarize the demographic variables such as age, duration of PD, gender, race, marital status, place of residence, and employment status of the participants in this study. Similarly, descriptive statistics such as frequency and percentage were calculated to depict their exercise frequency, exercise habit changes, and exercise beliefs. Associations between the types of exercise and beliefs were analysed with the chi-square test by using the SPSS software, version 23.0.

### Ethical approval

The research related to human use has complied with all the relevant national regulations and institutional policies, has followed the tenets of the Declaration of Helsinki, and has been approved by the ethics committee of the Faculty of Health and Life Sciences, INTI International University (approval No.: INTI/FHLS/RAC/JAN/2).

### Informed consent

A consent form including the details of the research project was given to each participant to sign as an indication of voluntary participation. The consent form provided a brief introduction, objectives of the study, participant selection, methodology of the study, duration, risks, benefits, confidentiality, and information of the right to refuse or withdraw at any time during the study. Informed consent has been obtained from all individuals included in this study.

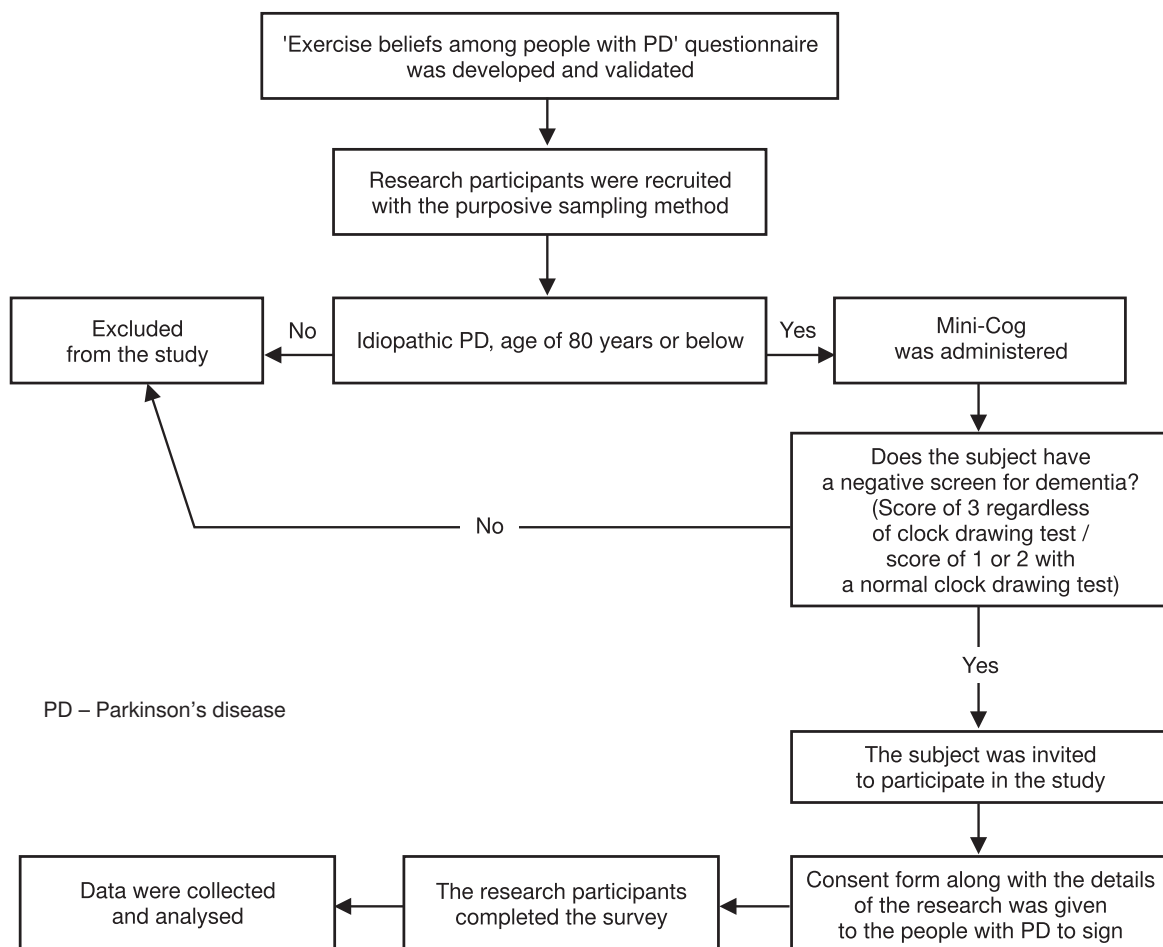


Figure 1. Flow chart of the study procedure

## Results

The mean age and mean disease duration of the research participants were 69 years and 9 years, respectively. As presented in Table 1, of the 47 study subjects, 26 were female and 21 were male. The majority of the individuals were married and unemployed. As for the place of residence, 34 were living in Selangor and only 13 in Kuala Lumpur.

In the first question, the participants were asked to recall the estimated amount of exercise they did in a week (none, < 2.5 hours/week, ≥ 2.5 hours/week). Table 2 shows that more than half of the research subjects (57.4%) exercised 2.5 hours/week or more, 38.3% exercised less than 2.5 hours/week, and only a small number (4.3%) did not exercise at all.

The participants engaged in the types of exercise presented in Table 3. The majority of them (66.0%) were involved in slow walks or other exercises that were of low intensity. High-intensity exercises, such as swimming and aerobic exercise, were less popular among the study subjects.

The participants were also asked about their beliefs regarding exercise. Their responses as depicted in Table 4. It was identified that 80.9% of the individuals with PD accepted the efficiency of exercises, 76.6% were aware of physiotherapy advantages, and 68.1% believed that changes in exercise habits, like exercising more, benefited them.

Table 1. Sociodemographic characteristics of participants

Characteristics	n	%
Age (years)		
Less than 50	4	8.5
50–59	4	8.5
60–69	25	54.19
70 and above	14	29.8
PD duration (years)		
5 or less	22	46.8
6–10	8	17.0
More than 10	17	36.2
Gender		
Male	21	44.7
Female	26	55.3
Race		
Chinese	40	85.1
Malay	4	8.5
Indian	3	6.4
Marital status		
Single	8	17.0
Married	39	83.0
Place of residence		
Kuala Lumpur	13	27.7
Selangor	34	72.3
Employment status		
Employed	4	8.5
Unemployed	43	91.5

PD – Parkinson's disease

Table 2. Exercise frequency

Amount of exercise	n	%
None	2	4.3
< 2.5 hours/week	18	38.3
≥ 2.5 hours/week	27	57.4

Table 3. Types of exercise

Type of exercise	n	%
Slow walks	31	66.0
Jogging	7	14.9
Swimming	2	4.3
Strength training	7	14.9
Dancing	12	25.5
Tai chi	10	21.3
Aerobic exercise	2	4.3
Indoor cycling	12	25.5
Other	20	42.6

A question was asked whether the respondents had been advised by any healthcare professional to exercise specifically for their condition; only 51% confirmed. Besides, fewer than 1/3 (29.8%) of the subjects reported that they had been recommended by their doctor/specialist to see a physiotherapist for their condition. This might indicate an under-utilization of physiotherapy services for people with PD in Kuala Lumpur and Selangor, Malaysia.

Table 4. Exercise beliefs

Item	n	%
Participants' beliefs concerning exercise for people with PD	38	80.9
Yes	1	2.1
No	8	17.0
I'm not sure		
Changes in exercise habits		
I exercise more	32	68.1
I exercise less	10	21.3
No change	5	10.6
Perception of physiotherapy benefits for people with PD	36	76.6
Yes	3	6.4
No	8	17.0
I'm not sure		
Received advice by a healthcare professional to exercise	24	51
Yes	13	27.7
No	10	21.2
I'm not sure		
Recommended by a doctor/specialist to see a physiotherapist	14	29.8
Yes	13	27.7
No	20	42.6
I'm not sure		

When the relationships between types of exercise and the participants' beliefs concerning exercise were analysed (Table 5), no significant associations were revealed with regard to any specific type of exercise.

The exercise beliefs results can be summarized as follows. Firstly, the participants were asked whether they believed that exercise could slow down the progression of PD symptoms. A significant proportion of the respondents (80.9%) believed that exercise could help slow down the progression of PD, 17% were not sure, and only 2.1% denied.

Table 5. Associations between types of exercise and the participants' beliefs

Types of exercises	Participants' beliefs concerning exercise (n = 47)						p
	Yes		No		Not sure		
	n	%	n	%	n	%	
Slow walks	27	57.45	1	2.13	3	6.38	0.147
Jogging	7	14.89	0	0	0	0	0.378
Swimming	2	4.26	0	0	0	0	0.781
Strength training	6	12.77	0	0	1	2.13	0.889
Dancing	11	23.40	0	0	1	2.13	0.525
Tai chi	9	19.15	0	0	1	2.13	0.681
Aerobic exercise	2	4.26	0	0	0	0	0.781
Indoor cycling	11	23.40	0	0	1	2.13	0.525
Other	15	31.91	0	0	5	10.64	0.334

Next, the subjects were asked how they thought exercise was beneficial for people with PD. Most participants were more likely to believe that exercise improved balance (68%) and walking abilities (66.0%). The other given options of exercise were opted for only by approximately 50% or fewer respondents (Table 6).

Table 6. Knowledge regarding the benefits of exercise for people with PD

Exercise benefits	n	%
It improves balance	32	68.0
It improves slowed and small movements	26	55.3
It reduces the risk of falls	24	51.0
It improves walking speed and ability	31	66.0
It reduces tremor (trembling of hands)	17	36.2
It allows to move independently for as long as possible	20	42.6
It improves mood	24	51.0
It improves fatigue	19	40.4
It improves sleep	22	46.8
It improves cognitive functions	17	36.2
Exercise is beneficial for everyone generally but not specifically for people with PD	4	8.5

PD – Parkinson's disease

## Discussion

There is a substantial amount of evidence to support exercise as crucial non-pharmacological management allowing to slow down the progression of PD [16]. The objective of this study was to examine exercise beliefs among people with PD.

According to the Malaysian Adult Nutrition Survey, the majority of Malaysian adults generally do not participate in regular and adequate physical activity. This may be due to the drastic rise in industrialization and urbanization in the past several decades [17]. In fact, in recent studies involving the general healthy population, 61% of Malaysians have been

shown to be inactive. In addition to common barriers experienced by normal adults, there are additional obstacles specific to individuals' diseases [18]. Hence, people with neurological disorders are expected to be generally physically inactive.

Therefore, it is interesting to note that the majority of PD subjects in this study (57.4%) reported that they practised exercise 2.5 hours/week or more, which is the minimum amount of physical activity recommended for an adult by the World Health Organization. This observation may result from the fact that the majority of the research participants were from a non-governmental organization where activities such as dancing and tai chi were regularly planned for its members.

The high exercise level reported in this study may also be associated with a large portion of the respondents (80.9%) believing that exercise is beneficial for their condition. However, no significant association between the types of exercises and the participants' exercise beliefs was identified. This can be due to a small population of the study; this issue can be addressed in future studies.

Further, our results revealed that 68.1% of the research participants started exercising more since their diagnosis of PD, which further indicates their awareness regarding the importance of exercise for their condition. A study performed to examine factors associated with brisk physical activity among community-dwelling older adults implied that those who believed in the importance of physical activity for their health were 2 times more likely to be physically active [19].

However, even though the research participants generally believed that exercise was good for them, it should be noted that their knowledge regarding PD-related health benefit of exercise could be improved. Under the question 'How does exercise help people with Parkinson's disease?', the respondents were asked to select from a list of answers. Only 'It improves balance' and 'It improves walking speed and ability' were chosen by more than 60% of the subjects. The other options were only selected by approximately 50% or fewer individuals.

Improved knowledge and positive beliefs about chronic-disease-related benefits of physical activity may have a potential to improve exercise adherence [20]. To improve patients' knowledge regarding the advantages of exercise, physicians or any relevant health professionals should discuss the role of physical activity and exercise in the initial stages of PD.

Besides, people with PD should be encouraged to join support groups, especially in the early stages of the disease, as studies have shown that support group participation exerts a positive influence on what patients think about practising physical activity [21].

Our study also points out that exercise and physiotherapy were not routinely recommended to people with PD. Only 24 out of the 47 respondents reported that their physician or other healthcare professional advised them to exercise, and only 14 out of the 47 maintained that they had been recommended by their doctor/specialist to see a physiotherapist. The reason why healthcare professionals did not regularly talk about exercise with their PD patients could be the lack of time. In turn, the lack of physiotherapy referrals may be explained by physicians' perception of physiotherapists in Malaysia. According to a study by Ramli [22], even though Malaysian doctors viewed physiotherapists as professionals, there was relatively less agreement regarding the professional aspect of knowledge, skills, and autonomy of judgement. The study suggested that improved communication between physicians and physiotherapists might enhance the appropriateness of physiotherapy referrals.

The lack of physiotherapy referrals by physicians can also influence exercise participation among people with PD [23]. There is scientific evidence to support the benefits of physiotherapy, which include preventing falls and physical inactivity [24]. In a study that examined exercise adherence in PD patients, some subjects stated that their decision to take an exercise program had been influenced by their physician and/or therapist [21]. Therefore, doctors and other health professionals should devote more time to talking about exercise habits with people living with PD.

## Limitations

The sample comprised only 47 people with PD from Kuala Lumpur and the Selangor state in Malaysia, which represents a narrow sample and may have made the relationships between types of exercise and exercise beliefs non-significant. Moreover, since most of the participants were from the same non-governmental organization, they were already actively exercising.

## Clinical implications

The knowledge regarding exercise beliefs of people with PD in Kuala Lumpur and Selangor gained from this study can be used to increase awareness among health professionals on the importance of educating PD patients about the benefits of exercise in order to improve exercise compliance among this population. This expertise is crucial for ensuring efficient, effective, appropriate, and reasonable intervention programs for people with PD.

## Conclusions

The study revealed that the majority of the individuals with PD believed in exercise efficiency and were aware that it was useful for their condition. However, some group of patients' beliefs concerning exercises still need to be improved. Moreover, the participants reported that exercise and physiotherapy were not routinely recommended to them. This important factor could be focused on when encouraging efficient, effective, appropriate, and reasonable exercise among people with PD.

## Acknowledgements

We would like to express our sincere gratitude to the Malaysian Parkinson's Disease Association for the continuous support rendered. We are also thankful to all the study participants.

## Disclosure statement

No author has any financial interest or received any financial benefit from this research.

## Conflict of interest

The authors state no conflict of interest.

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**Appendix**

**A survey of exercise beliefs among people with Parkinson's disease in Malaysia**

Demographic data:

Name: ..... Age: ..... Contact No.: .....  
 Gender: Male  Female   
 Race: Chinese  Malay  Indian  Other: .....  
 Marital status: Single  Married   
 Where are you currently staying: Kuala Lumpur   
 Selangor  Other: .....  
 Occupation: Employed  Unemployed   
 Years since diagnosis of Parkinson's disease: .....

Mini-Cog test:

1. Exercise frequency

Please identify, by ticking the box, how often you exercise per week:

None	
< 2.5 hours/week	
≥ 2.5 hours/week	

2. Type of exercise

Please identify, by ticking the box, the type of exercise that you usually participate in. You may select more than 1 option:

Slow walks	
Jogging	
Swimming	
Strength training	
Dancing	
Tai chi	
Aerobic exercise	
Indoor cycling	

Other (please specify): .....

3. Exercise beliefs

(a) Do you believe that exercise can slow down the progression of Parkinson's disease symptoms?

Yes	
No	
I'm not sure	

(b) In your opinion, how does exercise help people with Parkinson's disease?

It improves balance	
It improves slowed and small movements	
It reduces the risk of falls	
It improves walking speed and ability	
It reduces tremor (trembling of hands)	
It allows to move independently for as long as possible	
It improves mood	
It improves fatigue	
It improves sleep	
It improves cognitive functions	
Exercise is beneficial for everyone generally but not specifically for people with Parkinson's disease	

(c) How have you changed your exercise habits since you were diagnosed with Parkinson's disease?

I started exercising more ever since I was diagnosed with Parkinson's disease	
I started exercising less than before ever since I was diagnosed with Parkinson's disease	
My exercise habits have not changed ever since I was diagnosed with Parkinson's disease	

(d) Do you think that physiotherapy will be helpful for people with Parkinson's disease?

Yes	
No	
I'm not sure	

(e) Have you ever been advised by any healthcare professional (e.g. your doctor) to exercise specifically for your condition?

Yes, all the time	
Yes, but rarely	
Not at all	

(f) Have you ever been recommended by your doctor/ specialist to see a physiotherapist for your condition?

Yes, all the time	
Yes, but rarely	
Not at all	