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A Health Policy Perspective: Evaluating the Delivery of Boxing Exercise Programs for Parkinson's in Canada

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1. Abstract

Boxing is one of the most 'media-popular' promoted exercise interventions for individuals with Parkinson's disease (PD), yet there is very little scientific validation of its effects on brain function. With a disproportionate focus on boxing in the media, the accelerated promotion of programs internationally has raised concerns regarding the effectiveness and the costs of these programs. Thus, our study evaluated the effectiveness of the delivery of boxing programs in Canada using data gathered from telephone-interviews. Boxing programs were searched for using Google (the most popular search engine) and telephone-interviews were conducted guided by a questionnaire developed by the principal investigator. Programs (n=46) were identified and divided into Rock Steady Boxing (RSB) (affiliates share similarities in the delivery of exercise) and private boxing programs (PRV). Data was analyzed using SPSS, Chi-square tests and descriptive statistics were conducted. It was found that boxing programs did not effectively monitor symptom improvement using the appropriate tools (UPDRS-III) and measures. However, individuals are charged a participation fee. Based on the findings, this paper made policy recommendations to promote improved delivery of boxing programs for PD in Canada. These recommendations are essential for determining whether boxing programs for PD are a valid exercise therapy.

2. Keywords: Boxing; Exercise; Physical Activity; Parkinson's Disease

3. Introduction

Exercise to enhance brain function in neurodegenerative disorders such as Parkinson's disease (PD) has become widely recognized as an important adjunct treatment to medications [1]. While many exercise programs are available for people with PD, some stem from scientific research and others have gained their popularity from media coverage. For example, if someone was to Google exercise programs for Parkinson's the top search result would be boxing, making it one of the most media popular exercise programs for PD, with over 37,000 Google news hits.

Importantly, there are only two scientific studies evaluating the effectiveness of this program [2,3]. Neither study was able to confirm PD-specific motor improvement. As a result, clinicians and scientists have raised concerns and also cautioned that the accelerated implementation of media-popularized programs for PD may be dangerous until there is

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significant scientific evidence supporting them [4]. Accelerated popularity also makes it difficult to regulate or ensure proper administration and delivery across all sites. Thus, there is a critical need for an environmental scan of all media-popularized programs and appropriate recommendations for consistent administration.

Regardless of how individuals with PD are able to access exercise rehabilitation programs, it is important that the effectiveness exercise programs are carefully evaluated. In order to evaluate effectiveness, first, it should be determined whether or not those participating in the program have a clinical diagnosis of PD, as these programs are marketed towards individuals with Parkinson's. Next, even though there are many boxing programs available for PD only two studies have attempted to investigate its effect on motor symptoms. As such, in order to ensure all boxing sites are providing symptomatic relief, the gold-standard Unified Parkinson's Disease Rating Scale, motor subsection (UPDRS-III) should be used to monitor motor symptoms [5]. UPDRS-III is the primary assessment tool used to assess the effects of treatments on PD symptoms by both pharmaceutical trials as well as rehabilitation studies. As such, it is important for boxing programs to use this same tool to evaluate whether or not the intervention has an effect on PD motor symptoms. Next, it is important to consider whether the UPDRS-III assessor is qualified, as this may impact the results. Finally, if these programs are found to be effective, it is important that they are cost accessible to the entire PD population. Thus, this study aimed to first identify boxing programs available in Canada, and then investigate the effectiveness of these programs by exploring methods used to evaluated disease severity, qualifications of assessors as well as costs associated with participation. Based on the findings, recommendations were drawn to promote the delivery of boxing.

4. Materials and Methods

In this study, we aimed to find boxing programs as someone with PD or their loved one would. As a result, Google, one of the most common search engines available to the public was used to search for boxing programs for PD according to each city and province in Canada using the search terms (city, boxing; city, boxing program for Parkinson's disease; city, province Parkinson's boxing program; YMCA, Parkinson's boxing program). This led to the identification of 55 facilities, of which 46 took part in a telephone-interview guided by a questionnaire developed by the principal investigator Assessing the delivery of Boxing programs in Canada

1. Do you confirm clinical diagnosis of PD with the patient?
   a. YES
   b. NO
2. Are motor symptoms monitored?
   a. YES
   b. NO
3. What scale is used to monitor motor symptoms?
   a. UPDRS-III
   b. Hoehn and Yahr scale
   c. Other: _____
4. Who assesses motor severity?
   a. Qualified Unified Parkinson's Disease Rating scale instructor?
   b. Other: _____
5. Who runs the boxing exercise programs?
   a. Instructor
   b. Volunteer
6. What is the duration of the program?
   a. 1 hour
   b. 2 hours
   c. Other: _____
7. Is there a cost to participate in the program?
   a. NO
   b. YES. Please indicate:_____

to assess program delivery. This study was approved by Wilfrid Laurier University's Research Ethics Board (REB#10007242) and informed consent was obtained.

i. Statistical Evaluation

Data was collected from the questionnaires by the principal investigator and entered into a spreadsheet. Qualitative analysis was conducted using the software Statistical Package for the Social Sciences (SPSS), proportions, Chi-square tests (95% confidence intervals were used) and descriptive statistics were

computed.

5. Results

i. Number of boxing programs in Canada

A total of 55 boxing programs were identified, of which Rock Steady Boxing (RSB) affiliates (n=27) and private boxing program(s) (PRV(s)) (n=28)

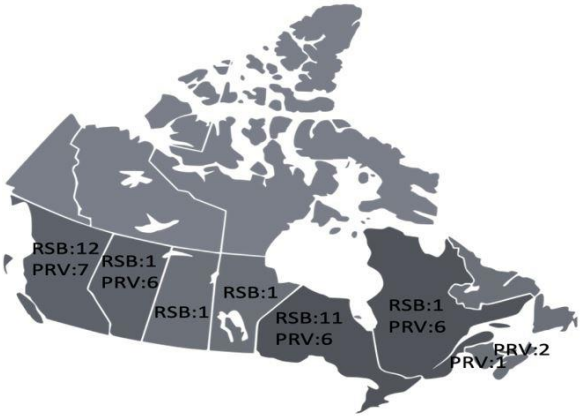

Figure 1: The number of boxing programs available in Canada (by province) and split by Rock Steady Boxing (RSB) and non-RSB Private programs (PRV).

ii. Clinical diagnosis of PD

None of the boxing facilities confirmed a diagnosis of PD from a certified clinician.

iii. Monitoring motor symptom improvement

The most common scale employed by RSB to monitor disease progression was the Fullerton Advanced Balance scale (FAB) (64%), whereas, 85% of PRV did not monitor symptom improvement. It was found that 95.2% of PRVs and 100% of RSB programs stated that boxing reduced PD-progression.

iv. Assessor training

41% of RSB instructors had RSB Certification (Figure 1). Additionally, 4% of RSB and 24% of PRB instructors had a formal education in PD. None had received formal UPDRS-III training through the Movement Disorders Training Program available at (movementdisorders.org).

v. Costs

There was a significant difference in costs between RSB and PRVs (p=0.01). The average cost per class was $30 for RSB and $15 for PRVs. The average monthly cost of a membership for RSB was $77/month and $35/month for PRVs.

6. Discussion

This is the first study that has attempted to evaluate the delivery of boxing programs for PD in Canada as a form of exercise to improve brain function. From the view of a governmental regulating body, this might serve as a quality control check. As there are an estimated 55 000 Canadians living with PD [6], it is important to determine whether highly available exercise programs are effective.

Results of this study revealed it is unclear whether all boxing programs are effective, however, there is a cost associated with participation. The boxing programs identified in this study were targeted towards individuals with PD, yet most do not confirm the diagnosis. This makes it difficult to claim whether boxing impacts PD as it is undetermined if the participants have Parkinson's in the first place. To determine the effectiveness of the program, it is important to first recognize whether or not the participant has PD.

Another important aspect to determine the effectiveness of boxing programs is to monitor the impact of boxing on PD symptoms. With over 50 boxing sites in Canada, it is important to determine whether each site is able to effectively improve PD motor symptoms. According to Schrag and colleagues (2006), for a treatment to be clinically effective in improving PD symptoms a minimal change of 5 points must be seen in the UPDRS-III scores [7]. However, motor severity was not assessed by the majority of boxing sites. The few RSB programs that attempted to monitor symptom improvement used the FAB scale which is a scale to measure balance [8], the gold-standard UPDRS-III scale would be a more appropriate measure to capture the total impact on motor severity. Additionally, even if a trained and qualified instructor conducted UPDRS-III assessments to monitor symptoms, it would negatively impact the results if a PD diagnosis was not initially recognized.

Even though we cannot confirm the effectiveness of

boxing programs for PD, there is a significant cost associated with participation. Inconsistencies in costs were present among boxing programs, where RSB programs were more expensive compared to PRVs. It is unclear whether or not the discrepancies in the cost of the programs were related to the amount of improvement or whether it was an arbitrary fee. The costs of the programs should not outweigh the benefits. If RSB is found to be effective in improving PD symptoms by future research, the costs of these programs may be a limiting factor for participation [9]. This is true in any age group and population, but especially in an older population where retirement may prohibit their ability to participate based on cost alone. As PD is more prevalent in older populations, the cost is a potentially serious barrier to participation for the PD population.

7. Conclusion

Together, this study found that although boxing programs for PD are popular in Canada, the effectiveness of these programs is unknown. Future studies should aim to determine the impact of boxing on PD symptoms using the appropriate measures and assessors. Finally, if found effective, costs associated with participation should be an important consideration. Based on the findings, recommendations were derived to promote effective delivery of care as well as cost considerations. With the growing number of boxing programs both in Canada and throughout the world, it is imperative to investigate effectiveness to ensure individuals with PD are experiencing improved symptoms, especially if they are paying out-of-pocket for these services.

8. Limitations

The primary limitation of this study is that boxing programs for PD are continuously expanding, there may be more programs offered in Canada that were not explored in this study. Importantly, as over-the-telephone interviews were the method employed in the study, interviewees could have been untruthful (in order to promote and protect their program) and there is a potential for recall bias. Finally, the principal investigator developed the questionnaire, thus it has not been validated. These limitations should be accounted for when considering the recommendations to promote the better delivery of boxing programs.

9. Recommendations

1. All boxing programs for Parkinson's should confirm a PD diagnosis with a clinician.
2. All facilities should monitor symptom improvement to ensure the effectiveness of programs using the UPDRS-III by a Movement Disorders Certified assessor.
3. While it is possible that the cost is proportional to the benefit of the program, it is more likely that the cost is an arbitrary fee and has no correlation to symptomatic benefits. Therefore, blinded RCTs must be conducted to better explore these benefits.
4. Boxing programs could work together with neurologists to increase awareness, credibility and visibility of programs.

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Declaration of Conflicting Interests

Sangarapillai K is a certified Rock Steady Boxing instructor, but there is no financial relationship or gain associated with this study. Norman BM and Almeida QJ have nothing to report.

10. References

1. Salgado S, Williams N, Kotian R, Salgado M. An evidence-based exercise regimen for patients with mild to moderate Parkinson's disease. Brain Sci. 2013; 3:87-100.
2. Combs SA, Diehl MD, Staples WH, Conn L, Davis K, Lewis N et al. Boxing Training for Patients With Parkinson Disease: A Case Series. Phys Ther.
3. Combs-Miller S, Dyer Diehl M, Chrzastowski C, Didrick N, McCoin B, Mox N et al. Community-based group exercise for persons with Parkinson disease: A randomized controlled trial. NeuroRehabilitation. 2013; 117-124.

4. Morris ME, Ellis TD, Jazayeri D, Heng H, Thomson A, Balasundaram AP, et al. Boxing for Parkinson's Disease: Has Implementation Accelerated Beyond Current Evidence? Front Neurol. 2019; 10.

5. Siderowf A, McDermott M, Kieburtz K, Blindauer K, Plumb S, Shoulson I. Test-retest reliability of the unified Parkinson's disease rating scale in patients with early Parkinson's disease: Results from a multicenter clinical trial. Mov Disord. 2002;17:758-763.

6. Wong SL, Gilmour H, Ramage-Morin PL. Parkinson's disease: Prevalence, diagnosis and impact. Heal Reports. 2014; 25:10-4.

7. Schrag A, Sampaio C, Counsell N, Poewe W. Minimal Clinically Important Change on the Unified Parkinson ' s Disease Rating Scale. Mov Disord. 2006; 21:1200-1207.

8. Schlenstedt C, Brombacher S, Hartwigsen G, Weisser B, Möller B, Deuschl G. Comparing the fullerton advanced balance scale with the mini-BESTest and berg balance scale to assess postural control in patients with Parkinson disease. Arch Phys Med Rehabil. 2015; 96:218-225.

9. Piette JD, Heisler M, Wagner TH. Cost-Related Medication Underuse Among Chronically Ill Adults: The Treatments People Forgo, How Often, and Who Is at Risk. Res Pract. 2004; 94:1782-1787.

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