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A Qualitative Phenomenological Exploration of the Experiences of Individuals with Parkinson's Disease Engaged in a Boxing Program

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Abstract

Boxing has emerged as a beneficial form of physical activity (PA) for individuals with Parkinson's disease (PD). Research typically emphasizes the physical benefits of boxing for individuals with PD but neglects other aspects that could promote long-term engagement in such programs. This study qualitatively explored the experiences of individuals with PD who are engaged in a boxing program. A qualitative phenomenological methodology was utilized. Twelve participants took part in a semi-structured interview. Data were thematically analyzed. Analysis revealed that participants experienced a variety of physical, social, and psychological aspects. Findings suggest that participants perceived increases in physical abilities and concentration through prolonged engagement in the program and social support upon recently joining the program. Other themes were also uncovered such as coming out of isolation, relatedness, escapism, and sense of accomplishment. The knowledge generated from this study can be valuable for health professionals seeking to design and implement specialized PA programs to improve the health of individuals with PD.

Keywords

Parkinson's Disease, Boxing, Physical Activity, Qualitative

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A Qualitative Phenomenological Exploration of the Experiences of Individuals with Parkinson's Disease Engaged in a Boxing Program

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Boxing has emerged as a beneficial form of physical activity (PA) for individuals with Parkinson's disease (PD). Research typically emphasizes the physical benefits of boxing for individuals with PD but neglects other aspects that could promote long-term engagement in such programs. This study qualitatively explored the experiences of individuals with PD who are engaged in a boxing program. A qualitative phenomenological methodology was utilized. Twelve participants took part in a semi-structured interview. Data were thematically analyzed. Analysis revealed that participants experienced a variety of physical, social, and psychological aspects. Findings suggest that participants perceived increases in physical abilities and concentration through prolonged engagement in the program and social support upon recently joining the program. Other themes were also uncovered such as coming out of isolation, relatedness, escapism, and sense of accomplishment. The knowledge generated from this study can be valuable for health professionals seeking to design and implement specialized PA programs to improve the health of individuals with PD. Keywords: Parkinson's Disease, Boxing, Physical Activity, Qualitative

Parkinson's disease (PD) is a neurodegenerative disease that affects the dopamine-producing brain cells in the basal ganglia. PD causes several movement disorders such as bradykinesia, muscular rigidity, postural instability, gait difficulties, and tremors (Boonstra, van der Kooji, Munneke, & Bloem, 2008; Chaudhuri, Healy, & Schapira, 2006; Chenoweth, Sheriff, McAnally, & Tait, 2013; Gelb, Oliver, & Gilman, 1999; Horstink et al., 2006), which makes it difficult for individuals with PD to perform routine tasks such as walking, bending, and turning (Keus, Bloem, Hendriks, Bredero-Cohen, & Munneke, 2007). PD is the most common movement disease and there is no known cure (Ceravolo, Pagni, Tognoni, & Bonuccelli, 2012); however physical activity (PA) has emerged as a way for PD patients to manage PD-related symptoms as long-term management of the disease can be challenging through pharmacological treatments (Connolly & Lang, 2014; Kessler & Rezak, 2007; Rascol et al., 2003; Tetrud, 2004; Ward & Robertson, 2004).

PA is a critical element of health and disease prevention (Bassuk & Manson, 2005; Schmitz et al., 2005). Individuals with PD who engage in PA have been known to experience improved physical functioning such as cardiovascular fitness, leg strength, flexibility, balance, gait speed, and quality of life (Crizzle & Newhouse, 2012; Dibble, Addison, & Papa, 2009; Gobbi et al., 2009; Goodwin, Richards, Taylor, Taylor, & Campbell, 2008; Herman, Giladi, Gruendlinger, & Hausdorff, 2007; Keus et al., 2007; Kwakkel, De Goede, & Van Wegen, 2007; Sage & Almeida, 2009; Schenkman, Hall, Kumar, & Kohrt, 2008; Yousefi, Tadibi, Khoei, & Montazeri, 2009). Individuals with PD who engage in PA on a regular basis have also been known to experience cognitive benefits such as improved working memory and communication (Nocera, Altmann, Sapienza, Okun, & Hass, 2010). Yet, only a small percentage of individuals within the PD population experience these benefits as they tend to be sedentary (van Nimwegen

et al., 2011), which incidentally increases their risk of cardiovascular disease, diabetes, cognitive impairments, osteoporosis, and depression (Wallèn, Franzèn, Nero, & Hagströmer, 2015). It is therefore crucial for individuals with PD to incorporate PA into their daily lives in order to prevent the deterioration of health, mobility, and independence brought on by PD (Schrag, Hovris, Morley, Quinn, & Jahanshahi, 2006) and sedentary living.

Traditional forms of PA and exercise (e.g., stretching, aerobic training, resistance training) can be beneficial for individuals with PD (Dibble et al., 2006; Herman et al., 2007; Schenkman et al., 2008). However, in recent years less traditional PA programs, such as boxing, have emerged as a form of beneficial PA for individuals living with PD. For instance, it has been found that individuals with PD can physically benefit from boxing by improving their balance, gait, and mobility endurance (Ridgel, Vitek, & Alberts, 2009). Boxing training is therefore considered as a feasible and enjoyable alternative to traditional PA programs for individuals with PD (Combs et al., 2011).

Boxing training aims to increase endurance in participants by having individuals maintain explosive strength to throw punches while moving quickly in the boxing ring for the entirety of each round (Guidetti, Musulin, & Baldari, 2002). Boxing training also consists of whole-body movements, including upper-extremity punching in combination with lower-extremity footwork along with trunk rotation and postural adjustments (King & Horak, 2009). Motions that are most commonly found in boxing training are spinal flexing, stepping in multiple directions, and a variety of movements performed at a higher than normal rate (Herman et al., 2007; Protas et al., 2005; Ridgel et al., 2009; Schenkman et al., 1998).

The purpose of this study was to qualitatively explore the experiences of individuals with PD who are engaged in a boxing program. Specifically, this study sought to answer the following research questions: a) what are the experiences of individuals with PD involved in a boxing program? and b) what aspects are perceived by individuals with PD to be important for promoting continued participation over time in a boxing program? Currently not present in research looking into this topic are the psychosocial implications individuals with PD obtain after having been involved in a specialized boxing or PA program over an extended period of time. Alternatively, research tends to focus solely on observable and measurable physical improvements brought on by boxing, or PA in general, for individuals with PD. However, understanding the psychosocial implications, in addition to the physical implications, of engaging in a PA program such as boxing through the narratives of individuals with PD can be valuable for health professionals working in specialized PA programs in order to promote health holistically and enhance the quality of life of individuals with PD. It is short-sighted to only address the physical benefits of PA for individuals with PD, as this ignores other issues these individuals experience on a psychological (e.g., depression, lack of motivation) and social (isolation, anxiety in public places) level (Forsaa, Larsen, Wentzel-Larsen, Herlofson, & Alves, 2008; van Nimwegen et al., 2011).

A qualitative phenomenological approach is taken here because such outcomes have received little attention in the PA literature examining people with diseases and, to the best of our knowledge, few to no measures exist that can help us quantify long-term psychosocial benefits of PA within this particular set of participants. Qualitative research is useful for discovering new concepts and creating new theories on scantily explored topics using people's perceptions and narratives (Crotty, 1998). Moreover, due to the unobservable nature of psychosocial implications of being involved in a PA program, the use of people's perceptions and narratives is the best approach to understanding what they are. Understanding the experiences of individuals with PD engaged in a specialized boxing program, in addition to the physical benefits they receive, can be valuable for health professionals working in specialized PA programs. The reported experiences of individuals with PD in this type of program can also

facilitate the promotion of and long-term engagement in such programs designed to enhance the health of individuals with PD.

Authors' Roles and Context

The authors of this study are scholars in the field of Health Sciences and conduct qualitative research on the psychosocial aspects of PA participation in various populations. This study was developed once the authors recognized that there was a lack of recent research looking into the psychosocial implications of PA involvement for individuals with PD, despite PD being one of the most common movement related diseases. In addition, it was also recognized that boxing as PA for individuals with PD was also an emerging trend in the literature. However, researchers looking into how newly emerging intensive PA programs like boxing tend to investigate how such programs directly impact the physical symptoms of PD without exploring what motivates individuals with PD to stay engaged in such programs. Thus, it was deemed appropriate by the authors to look into other potential motivating factors that promote participation so that individuals with PD can continue to experience the physical benefits of boxing training. This study is also derived from a larger project conducted by the first author exploring PA behavior for individuals with disabilities.

Methods

Research Design

The authors used a qualitative phenomenological research design to gain a better understanding on the experiences of individuals with PD in a boxing PA program (Leedy & Ormrod, 2013). The qualitative phenomenological research design is typically utilized for understanding and documenting changes that participants experience over an extended period of time (Grbich, 2013). This research design was therefore useful for the researchers to collect data on the experiences of participants over the course of their involvement in the selected program. The qualitative phenomenological approach was also well-suited for this study to uncover revelations in our understanding of processes in which experiences, actions, and behaviors take place, while understanding how such processes lead to or cause certain outcomes that cannot be uncovered through predetermined responses in survey and experimental research (Maxwell, 2004a, 2004b; Miles & Huberman, 1994).

Participants and Context

Participants for this study were recruited from the Boxing 4 Health program and NeuroLogic Physiotherapy (which refers patients to Boxing 4 Health) clinic located in Ottawa, Canada. Boxing 4 Health is a community-based boxing program that is affiliated with the Rock Steady Boxing Organization and is intended for individuals with PD to benefit from a structured PA program. Individuals were purposefully selected to participate in this study based on their knowledge and capacity to provide the in-depth information needed to answer the study's research questions (Maxwell, 2013). Participants' lengths of engagement in the Boxing 4 Health program varied which allowed the researchers to better understand how experiences differ based on their time spent in the program. Individuals were eligible to participate if they were: diagnosed with PD by a physician, at least 18 years of age, and capable of engaging in PA/Boxing 4 Health on a regular basis.

Since qualitative research is often a time-consuming process which consists of collecting large amounts of information from each individual respondent, it is not uncommon

for qualitative studies to contain relatively small samples of participants (usually between 5 and 25 participants) (Creswell, 2007). Twelve participants agreed to take part in this study. Participants were engaged in the Boxing 4 Health program between 1 to 12 months, attended roughly two sessions per week on average, were between 53 to 73 years of age, and had been diagnosed with PD between 1 and 15 years. Table 1 summarizes participants' characteristics.

Table 1.

ID Code	Gender	Years with PD	Months involved in B4H	Avg. sessions per week
PD1	F	1	7	2
PD2	F	3	6	3
PD3	M	1.5	5	1
PD4	M	8.5	4	3
PD5	M	11	1	2
PD6	F	1.5	4	2
PD7	M	8	5	2
PD8	M	15	4	3
PD9	F	2	8	2
PD10	M	5	1	2
PD11	M	8	12	3
PD12	F	13	3	3

Notes: B4H = Boxing 4 Health, Avg. = average

Boxing 4 Health program sessions typically start with a 10 to 15-minute warm-up of walking exercises (e.g., high-knees, side shuffle) where trainers emphasize on posture and stretching of the major muscle groups in the trunk and extremities. At times after warm-ups, participants will take part in various games such as throwing and catching balls of different size or other adapted games. Sessions then continue with a 30 to 40-minute circuit regimen focusing on physical functioning, endurance and punching activities that alternate between 1.5-3 minute training intervals and 1-minute rest/transition breaks. The functional portion consists of activities of whole-body fitness such as squats, stepping on balance boards, skipping, and jumping rope, along with boxing ring work, which focuses on footwork, speed and agility. Endurance activities include cycling on stationary bikes and holding one's body in certain positions (e.g., planking, holding balls between the knees while elevating the pelvis and abdomen). Punching activities consist of punching heavy bags, speed bags, and focus mitts. There are also kicking activities where participants must kick a standing padded cylinder. Activities are made more challenging by encouraging participants to perform activities as intensely as they can within their functional capacity and to complete more repetitions/punches in each exercise. Also, during the activities trainers sometimes show participants cards with mathematical equations displayed on them to which participants must solve. Participants may also be asked to shout colors, animal names, or other things during exercises. Participants are also encouraged to say out loud the number of punches they make, typically in intervals of two to emphasize on cognitive functioning. Typically, there are four to five exercises in the circuit and participants complete the circuit twice. Sessions end with a 10 to 15-minute cool-down which consists of activities that stretch the spine and neck, and other low intensity strengthening and breathing activities.

Data Collection

Prior to data collection, the investigators obtained ethics approval from the Health Sciences Research Ethics Board at their affiliated institution. Data collection occurred through individual in-depth semi-structured interviews, which is common practice when conducting phenomenological research (Grbich, 2013). In addition, the primary researcher attended some of the boxing sessions to gain a better understanding of the flow of the program sessions. The use of semi-structured interviews meant that the questions during the interview evolved as the interviews progressed, instead of being rigid (Creswell, 1994).

The use of semi-structured interviews allowed participants to share personal narratives on their experiences in the Boxing 4 Health program. Interviews were held in different locations that were most convenient for participants including their homes, coffee shops, and at the Boxing 4 Health gym after program sessions. Prior to the interview, participants had the opportunity to read over the consent form and ask questions regarding the purpose of the study. Once participants were comfortable, they signed the consent form and the interview began. Interviews were recorded using a digital voice recording device and lasted between 20 and 84 minutes. The average interview length was 45 minutes.

The first author conducted the interviews. Qualitative research into this topic is fairly uncommon and there were no standard qualitative instruments using open-ended interview questions that could be used to facilitate the creation of this study's interview guide. In addition, initial responses to open-ended questions are more likely to lead the researcher and the participant in the direction of the experiences in a natural manner (Grbich, 2013). Thus, data were collected simultaneously with the data analysis process to inform and augment how data collection would proceed in future interviews. A dynamic and continuously evolving interview guide was therefore utilized to grasp a better understanding on participants' experiences within the program over the course of their engagement. The interview guide started with broad questions meant to gather basic information on the topic at hand and later evolved to add questions that were more suited to address the phenomenon being investigated, which led to gathering more specific information from participants (Rubin & Rubin, 2005). For instance, the interview guide initially contained broad open-ended questions such as, "*Can you talk to me about your experience in the boxing program?*," "*What is it like to be involved in the boxing program?*," "*What made you want to engage in the boxing program?*" and "*What made you want to stay engaged in the program?*" While these questions were asked in each interview, other questions were eventually added and refined to emphasize on specific themes as they appeared to be more relevant to the study's purpose. The researcher also returned to previous questions and used probes to seek clarifications and to further explore different aspects that appeared to be related to their experience in the program (Grbich, 2013). Thus, some questions became more geared to collect data pertaining to the positive experiences acquired from being engaged in the program such as, "*What type of benefits have you experienced from the boxing program? (Probe: personal, physical, social)*" and "*What do you enjoy about your involvement in the boxing program? (Probe: personal, physical, social).*"

Data Analysis

The data analysis process involved all four researchers. Steps for acknowledging researcher bias when using a qualitative phenomenological research design were undertaken to ensure the credibility of the findings and the interpretations drawn by the researchers using techniques proposed by Grbich (2013). For instance, bracketing interviews were conducted to identify and separate the researchers' personal experiences and assumptions from their interpretations of the participants' narratives. Analysis occurred simultaneously during the data

collection process to further inform how data collection would proceed and to determine when enough data was collected to address the study's research questions. Data were analyzed using inductive thematic analysis. Although there are discrepancies when it comes to the ideal steps for conducting a thematic analysis, the analysis process for this study involved using a combination of detailed criterion for conducting an inductive thematic analysis established by Braun & Clarke (2006) and Grbich (2013) to ensure rigor and credibility of findings. Thematic analysis is described as "a method for identifying, analyzing and reporting patterns (themes) within data" (Braun & Clarke, 2006, p. 79).

The first step of analysis began with the researchers transcribing the recordings with a great level of detail, which followed with comparing the transcripts to the recordings again afterwards for accuracy (Braun & Clarke, 2006). Each recording was transcribed into Word documents and edited by the researchers for errors. Afterwards, in order to achieve a deeper understanding and familiarity of the data, the investigators did a thorough reading of the transcripts (Grbich, 2013). Data was then coded into categories, as once the researchers were familiar with the content of each transcript, key segments of the transcripts were then underlined when they were believed to be relevant to address the study's research questions (Grbich, 2013). The researchers also wrote descriptive comments for further reference that were associated with key segments of text highlighted from the previous step (Braun & Clarke, 2006; Grbich, 2013). Presented below are examples of initial codes and descriptive comments to illustrate the process of the steps outlined above:

Table 2.

Codes	Descriptive Comments
Various types of benefits or aspects involved in keeping participants engaged in the program	Many participants talk about the physical benefits they receive from the program because of its intense regimen. But they seem to enjoy other aspects, such as socializing with similar others, just as much.
Being involved in the program impacts different facets of their daily lives	Participants explain that while the physical benefits help them perform tasks of daily living, social and psychological aspects also have an important influence on their daily lives.
Various physical outcomes	Participants talk about how boxing has several elements that address their limitations, which in turn helps them in their daily lives.
Various social outcomes	Some participants develop friendships find support, Also coming out of their shell.
Various psychological outcomes	Punching releases frustrations. They can also complete tasks which makes them happy. Also reports of increases cognitive abilities.

Furthermore, coded key segments of text were matched with other relevant segments and organized into groups of comparable quotes containing similar ideas and concepts, which eventually led to the development of salient themes and subthemes (Grbich, 2013). For example, it became evident that participants continued their engagement due to various aspects of the program. Narratives also tended to revolve around physical, social, and psychological outcomes related to the program, which facilitated the development of themes. Analysis revealed that descriptive comments such as “some participants develop friendships,” “find support” and “also coming out of their shell” could be grouped into a broader “social aspects” theme. The final step of analysis also revealed that this theme could also be divided into subthemes based on the descriptive comments, which led “some participants develop friendships” to “relatedness,” “find support” to “receiving social support” and “also coming out of their shell” to “coming out of isolation.” The analysis was done by all four researchers; thus, generated codes were cross-referenced amongst each other. The comparison and discussion of findings were generated in an independent manner therefore became a way to ensure rigor when it came to the interpretation of the data (Creswell, 2009).

With respect to participants’ experiences in the Boxing 4 Health program, three major themes, each with their own set of subthemes, will be presented. The theme “physical aspects” pertains to perceptions related to outcomes regarding improvements in bodily functioning acquired through participants’ engagement in the program. Subthemes associated with this theme are “perception that boxing addresses the needs of individuals with PD” and “improvements in daily functioning.” The theme “social aspects” pertains to perceptions stemming from socializing with others in the program. Subthemes that were uncovered under this theme are “coming out of isolation,” “relatedness,” and “receiving social support.” Lastly, the theme “psychological aspects” pertains to perceptions related to mental and emotional states experienced through participants’ engagement in the program. This theme consists of the subthemes “escapism,” “perception of increased concentration” and “gaining a sense of accomplishment.” The example below illustrates how final themes were derived and organized from the codes and descriptive comments that were initially developed:

Table 3.

Initial Codes and Comments	Groups/Themes	Subthemes
<ul style="list-style-type: none"> • Participants talk about how boxing has several elements that address their limitations, • Being involved in the program impacts different facets of their daily lives 	Physical Aspects	<ul style="list-style-type: none"> • Perception that boxing addresses the needs of individuals with PD • Improvements in daily functioning
<ul style="list-style-type: none"> • Developing friendships • Finding support • Coming out of their shell 	Social Aspects	<ul style="list-style-type: none"> • Coming out of isolation • Relatedness • Receiving social support
<ul style="list-style-type: none"> • Punching releases frustrations. • They can also complete tasks 	Psychological Aspects	<ul style="list-style-type: none"> • Escapism • Perception of increased concentration

- which makes them happy.
 - Reports of increases cognitive abilities
 - Gaining a sense of accomplishment
-

The themes described here are all derived from implications, outcomes, benefits that are related to participants' experiences and motivational factors for continued engagement in the Boxing 4 Health program. Presented in the results are quotes to support the researchers' interpretations and the themes that were developed. In order to increase the confirmability of the findings, the researchers utilized triangulation strategies. For example, member checking was performed as participants received their transcript as a password protected document via email and had the opportunity to review their transcript and add clarifications on the topics discussed during the interview. Second, peer review was employed where the researchers discussed and shared their ideas and themes with experts and other researchers within the field to determine the accuracy of their conclusions. Lastly, the researchers held discussions and challenged their individual interpretations until a consensus was reached on the main themes and subthemes.

Results

Physical Aspects

One of the most mentioned and emphasized aspects regarding participants' experiences in the boxing program was the perception that they had increased physical abilities through prolonged engagement in the program. Two subthemes emerged from these described experiences, that is, the perception that boxing addresses the needs of individuals with PD, and improvements in daily functioning. For instance, many participants explained that they believed the activity of boxing itself and the other activity regimen within the program addresses the needs and challenges that many individuals with PD experience in daily living. This was perceived to be the result of the different exercises and techniques found within the boxing program and suggestions offered by the trainers that touched on how to use different muscle groups and perform activities properly by maintaining posture. The concept of "loosening" in the muscles which addresses symptoms related to stiffness experienced by individual's PD also came up frequently as an important aspect of increased physical functioning. For participants who have been engaged in the program for an extended period of time, it was described that:

You're twisting in one case and punching in another case and using different muscle groups with each station. You're loosening up all kinds of parts of your body rather than it just being a one-motion activity which doesn't attend to all the muscle groups. (PD12)

Furthermore, it was explained by participants who were more challenged physically in terms of mobility that the boxing program's emphasis on different aspects such as flexibility, balance, and coordination has allowed them to improve their abilities to perform activities in daily living. For instance, it was expressed by one participant that over time her engagement in the program has facilitated gait and mobility:

It's like the body doesn't function [when you have Parkinson's disease]. You have too much stiffness. [...] The program is good; it builds strength. It covers many aspects [such as] flexibility, balance, [and] coordination. It's not only

boxing. It's all the things that [you] do in the class. [...] The stretching, the flexibility; [you] do many things besides boxing. [...] I have more mobility [now]. I'm walking better. I'm functioning better. It's giving me more capacity physically. (PD2)

Another participant stated that through his prolonged engagement in the boxing program and the loosening of certain muscle groups in the spine that he has experienced benefits such as an increased ability to perform daily activities such as getting dressed and bending down to tie shoes:

It's much easier to bend over because you've limbered up, and you can dress easier. [...] the punching motion [makes it] much [easier] to deal with the problems of bending over and tying your shoes because you're exercising the muscles that you normally wouldn't, because some of the muscles you tend to not use them as often so they tighten up. (PD11)

The ability to successfully perform daily tasks and increase physical functioning was mainly experienced by those who have been engaged in the program for an extended period of time. Those who have recently engaged in the program did not necessarily perceive or experience physical changes however, they noticed changes in other participants. One participant who was asked if he had experienced any physical changes as a result of his engagement in the program responded with "no, not really. I've only been going for a month [but] I've seen a couple of people who can get in and out of a chair now unaided as a result of the exercises they're doing" (PD10).

Social Aspects

Three major subthemes emerged with regards to social aspects associated with participants' experiences in the boxing program: coming out of isolation, relatedness, and receiving social support. It was explained that being engaged in a structured PA program forced participants to integrate themselves within a social environment containing other individuals with PD. As such, it was described by one participant that engaging in the program reduced his time alone at home and gave him the opportunity to develop interpersonal relationships:

I live by myself and so I needed to get out and that was just one activity that forced me to go out and it is regularly scheduled and organized so it's part of how you motivate yourself. [...] [It was] something that was getting me out of the house and with people and develop or [have] social contact and get some exercise. (PD5)

In turn, coming out of isolation and re-integrating one's self within a social environment not only helped participants develop interpersonal relationships within the program but also had implications in terms of strengthening interpersonal relationships outside of the program with significant others. According to one participant who felt socially withdrawn after receiving his diagnosis, he and significant others recognized changes in his social interactions and willingness to engage in social environments after being involved in the program for a few months. He explained:

When you get into the social aspect of things there's a big difference between the way I was a year ago and the way I am now. [...] I was withdrawing from

my friends, from my family, [and] from [social] events. I didn't want to go out. I wasn't particularly interested in going to parties. I'm a hockey fan and I used to like going to [watch] games. But the last game I went the crowds were just overwhelming to me mentally. [...] So I have changed quite a bit. I'm much more outgoing than I was a year ago. I'm much more social. My wife, my children, [and] my friends have all noticed a significant difference in the last four and a half months since I started boxing. [...] I was on [medications] for a year before I started boxing and the [medications] gave me some physical relief but they didn't give me any social relief. I only started recognizing the social relief after I started the boxing and my kids have commented on it, my friends have commented on it, [and] my family has commented on it. (PD3)

Moreover, engaging in a program consisting of individuals with PD was described as a way to gain a sense of belonging and find relatedness within a group of similar individuals. Several participants explained that they enjoy the social aspect of the program and having the opportunity to develop interpersonal relationships with other participants. The program provides a context for individuals with PD to get together which is an opportunity that they may not otherwise have, as explained by one participant: "I don't have other areas of my life where there are other people with Parkinson's that I can talk to" (PD1). Similarly, another participant stated: "I enjoy the social aspect of it [and] talking with guys my age and with my disability" (PD4). For another participant, it was described that finding relatedness by communicating with individuals who understand what she is going through was one of the first things she experienced upon engaging in the program:

The first thing I benefitted from was that I [recognized that] I am not alone at all because I saw other people with the same disease. It's a venue to communicate with somebody who understands the limitations and helps you through overcoming them. (PD6)

Similarly, it was also expressed that after recently joining the program other members immediately expressed an interest in learning their life experiences and encouraging each other to overcome limitations brought on by PD, as well as offering support: "the participants are all there for similar reasons, all wanting to know your story, all wanting to encourage you if they can" (PD10). As a result of gaining a sense of belonging and receiving social support from similar individuals within the program, participants explained that they feel comfortable within the context of the program and are relieved from the stigma they perceive when experiencing PD related symptoms, as stated: "I like the fact that you walk in and that everyone is in the same boat, so if you start shaking [because of tremors] you're not as self-conscious about it" (PD12).

Psychological Aspects

Participants also emphasized on the psychological implications of being involved in the Boxing 4 Health program. Three primary themes emerged with respect to psychological aspects: escapism, perceptions of increased concentration, and gaining a sense of accomplishment. For example, one participant who experiences several challenges of living with PD and perceptions of stigma described that attending the boxing program helps him deal with the daily frustrations of living with PD. Attending the program therefore tends to act as a coping mechanism for him to escape the stresses he experiences as a result from dealing with the disease:

[Being diagnosed with PD] changed my whole life. [...] It's hard to communicate with people and your general physical ability is a lot less. [...] The communication and some of the symptoms are very imbalanced. Like hyper-salivation to the point where I moved from [where I was living] to here. I didn't want people to see me like this. [Now that I'm in the boxing program] I feel completely at ease. The boxing is something that you [can use to take] your mind away from everything else. It's just in that bag. [...] It gives you an outlet. (PD8)

For another participant who has been engaged in the program for roughly five months' time, he perceives that the combination of physical activities such as punching bags and cognitive activities such as shouting various topics selected by the instructors has helped him increase his ability to concentrate. The participant also explained that his perceived ability to concentrate more makes him less frustrated when performing daily activities and hobbies:

We're punching and we're screaming but [when] we're screaming we have to think and so it's working your brain [...]. It's hard to [punch and] yell out movie titles, or vegetables, or things like that. You think "well I can yell out the names of animals when I punch. It's like albatross [punching motion] baboon, [punching motion] cat, [punching motion] [...]." It sounds easy sitting here but when you're throwing hard punches and you're concentrating on that [it becomes difficult]. [...] The [medications I take] helped a bit in my mental acuity but I've noticed a difference since I started boxing. [...] I don't get flustered the way I used to get flustered. I do a Sudoku and my Sudoku prowess is stronger than it used to be. (PD3)

The participant also makes a distinction between taking medications and being active in the boxing program. He briefly explains that the medications themselves do not necessarily help with increasing concentration, rather, he noticed changes in his ability to concentrate once he started boxing and performing cognitive exercises within the program. The same participant makes similar distinctions in a previous quote explaining how medications did not help with feelings of social withdrawal, instead it was through his engagement in the program that these changes occurred.

The final psychological aspect in which several participants experienced is gaining a sense of accomplishment. This was described as a result of meeting the challenges of the program and being able to adequately perform program activities despite having physical limitations. The term "still being able to do things" came up frequently which helped the researchers develop this theme. This sentiment was also something that was experienced by both those who have recently joined the program and those who have been engaged in the program for several months. For example, one participant stated: "the biggest thing is you feel better about yourself [...] meeting a series of challenges and being able to do them" (PD7), while another participant explained: "I think it's good for my self-confidence, [and] my self-respect. [It's] just good [for my] mental well-being because it proves to me that I can still do things. It proves to me that I'm not giving up" (PD5). Finally, another participant expressed that:

[Being in the program shows] that I still can do something. I can still be active. I can still perform in some way. It's very hard when you feel that you are not able to do anything. [...] It's a sense of accomplishment. (PD2)

Perhaps one of the reasons why participants gained a sense of accomplishment was due to the fact that staff constantly adapts program activities to the individual needs of participants. As such, activities are tailored to allow participants to work on issues that they are most concerned with and can still perform activities without experiencing feelings of incompetence, as explained:

You can talk to [the staff] about [your challenges]. You're in a smaller group. [The staff may] not [be] trying to cater to 100% of the people with all different capabilities. [But] I can say to them "I'd like a little more time on the bag" and they'll normally try to accommodate it. (PD10)

Participants experienced a series of psychological benefits through their involvement in the Boxing 4 Health program. When performing program activities, participants were able to escape from their daily struggles of living with PD. Participants also perceived that they had gained an increased ability to concentrate when performing tasks and hobbies in of daily living. Lastly, participants expressed that they felt a sense of accomplishment through their ability to perform program activities however; this was facilitated by program staff tailoring activities to the limitations of participants.

Discussion

The purpose of this study was to explore the experiences of individuals with PD who are engaged in a boxing program. The knowledge generated from this study can have implications for health professionals seeking to design and implement specialized PA programs to improve the health and well-being of individuals with PD through long-term engagement in such programs.

Participants in this study experienced changes in physical functioning from engaging in the boxing program, which were consistent with previous research (Combs et al., 2011; Gobbi et al., 2009; Sage & Almeida, 2009). For instance, participants reported finding it easier to perform daily tasks such as getting dressed and tying shoes due to increased flexibility, range of motion and better mobility through their prolonged involvement in the program. These changes may have occurred thanks to the whole-body approach that is typically utilized in boxing (Combs et al., 2011). As described, boxing training and the Boxing 4 Health program incorporates a mixture of dynamic activities (e.g., stepping on balance boards), multidirectional reaching and stepping activities (e.g., punching focus mitts), and agility drills (e.g., skipping) situated within a circuit-style activity regimen which emphasizes on initiating movements and rapid changes in direction. Incorporating these various types of activities that emphasize on different limitations of individuals with PD may have helped participants perceive changes in physical functioning over the course of their participation in the program for several months' time.

Also described in the current study are a series of socially related experiences that were described by participants. For example, recent diagnoses of PD in addition to displaying physical symptoms (e.g., tremors) may have been responsible for imposing a more isolated lifestyles and perceptions of stigma when in public areas for these individuals. This is consistent with previous research describing how individuals with PD are more likely to live socially isolated lifestyles (Forsaa et al., 2008) and can be self-conscious of their symptoms (McNamara, Durso, & Brown, 2003). However, participants described how engaging in a structured PA program became an opportune way for them to come out of isolation and become re-integrated within a social environment consisting of similar individuals. The program became a reason to get out of their homes to associate themselves with a group of individuals

who share similar social challenges. Participants also explained that they gained an enhanced social life extending beyond the program as well as feeling more driven to engage in social activities with friends and family. This outcome appears to be a result of changes in the overall mood of participants after being involved in the program for several months, thus feeling more motivated to go out and less compelled to withdraw from and feel uncomfortable in social settings. Also interesting is one participant's assertion that medication, while providing physical relief, does not necessarily improve the desire to engage in every day social activities and instead attributes such changes to their participation in the boxing program. These findings become important to consider in order to relieve social isolation among individuals with PD.

Emotional support is often one of the most important issues for individuals with PD (Kleiner-Fishman, Gryfe, & Naglie, 2013). In addition, belonging to disease-based support groups as an outlet for dealing with psychosocial challenges is considered important to many individuals with PD (Artigas, Striebel, Hilbig, & Rieder, 2015). In relation to previous research addressing the importance of social support for individuals with PD, another social aspect that was experienced was relatedness as participants described being able to socialize with similar others in the boxing program. The program environment consists of a group of individuals in similar situations and experiencing similar challenges which became an opportunity for participants to communicate and share personal experiences with others with regards to living with PD. This seemingly facilitated the development of interpersonal relationships between members in the program. These relationships and opportunities to relate to similar others, which may not be plentiful in the personal lives of these individuals, was also described as a way to find belongingness with a group. Relatedness and a sense of belonging was also described as one of the first things that was experienced upon joining the program. Consequently, the immediate acceptance of new participants in the program and the sense of belonging that was achieved for new members became a way for them to find social support and encouragement for dealing with challenges related to PD. The importance of having opportunities to gather individuals with PD in a context together can therefore be critical to relieve isolation.

Participants also described experiences related to psychological aspects. Punching bags became an effective way for some participants to experience escapism, release their frustrations and become at ease with themselves. The challenges of living with PD can be more difficult to cope with for some based on the severity of their PD and how their symptoms affect them. However, punching became an activity, which allowed participants to focus their energy in punching the bag and release tensions that they experience with regards to the challenges that they experience. Little research has explored the concept of escapism in various contexts for individuals with PD. However, these findings bear similarities with previous research on individuals with neuromusculoskeletal diseases suggesting that PA is an opportune way to experience escapism and PA being an emotional outlet for them as well (Newitt, Barnett, & Crowe, 2016). In addition, it was also stated that performing more complex activities that incorporate multiple tasks such as punching heavy bags and having to count out loud, shout the names of animals, or solve mathematical problems increased some participants' perceptions of an increased ability to concentrate. Incidentally, certain tasks and hobbies requiring a stronger mental effort became less frustrating to perform over time. Increased concentration was attributed to performing complex activities in the program and distinctions with regards to medications' role in increasing concentration were made again in that medications tend to relieve patients physically but not mentally/psychologically nor socially.

Individuals also gained confidence from the sense of accomplishment they received by successfully performing activities within the program, which has also been described in previous research by Newitt et al. (2016). The process of gaining a sense of accomplishment was facilitated by activities within the program being adapted to the specific needs of participants and that address their individual challenges. As such, participants experience a

program with an appropriate level of challenge while still being able to complete activities based on their physical abilities, which may prevent feelings of incompetence and frustration when engaging in program sessions. Tailoring programs to the needs of individuals is a common way to deal with varying levels of functioning among these individuals and is a crucial factor for increasing or decreasing one's level of enjoyment and motivation to stay engaged in a PA program (O'Brien, Dodd, & Bilney, 2008).

This study has practical implications for health professionals. The importance of having individuals with PD be active together can help create a positive environment and allow them to create interpersonal relationships and find support with others experiencing similar challenges. Findings generated in this study also highlight the effectiveness of using a whole-body approach to PA for individuals with PD as it can help them improve different aspects of physical functioning affected by PD. Our findings also demonstrate the need to tailor program activities to address the specific needs of individuals with PD, which can help them gain a sense of accomplishment and confidence in themselves and their ability to perform activities successfully in a program. Future research should consider how the findings of this study could be applied to develop and implement other effective PA programs for individuals with PD.

Limitations

Limitations of this study must be acknowledged. For instance, boxing training may not be a uniquely beneficial PA program for individuals with PD to experience physical changes. Other programs utilizing whole-body approaches such as tango (Hackney, Kantorovich, Levin, & Earhart, 2007) and Tai-Chi (Hackney & Earhart, 2008) have been significant in improving physical functioning for individuals with PD. This may be an indicator of the effectiveness of programs that utilize whole-body approaches over others that have activities that repeat the same activities each session. The geographical scope may also limit this study's generalizability in that participants were recruited from one program.

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