

Trying to remain active whilst living under threat: Exploring the barriers and facilitators to physical activity during the COVID-19 pandemic, in people living with chronic respiratory disease

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◆ *Keywords* | Chronic respiratory disease, physical activity, adherence, COVID-19, fear.

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Abstract

Background

People living with chronic respiratory disease (CRD) were advised to shield during the COVID-19 pandemic due to their perceived vulnerability. Changes in activities of daily living and exercise habits contributed to reductions in physical activity (PA); which associate with adverse health outcomes in this population. Factors affecting PA behaviour in people living with CRD during the pandemic are currently unclear.

Aim

To explore barriers and facilitators to PA during the COVID-19 pandemic amongst people living with CRD and provide insight into measures that may support engagement with PA in the future.

Method

A qualitative design using interpretative phenomenological analysis (IPA) was used to gain in-depth understanding of lived experiences during the pandemic. Ten people living with CRD were interviewed using semi-structured interviews. Verbatim interview transcripts were analysed as per IPA steps: 1) case-by-case review 2) identify emergent themes for each individual 3) identify master themes from across all cases. Trustworthiness was enhanced through use of researcher triangulation, member checking, and use of a reflexive diary.

Results

All participants reported reduced PA during the pandemic. Five master themes were

identified: (1) fear of COVID-19 (2) influence of government restrictions (3) top priority or on the backburner (4) reinforcing or reducing motivation (5) personal context is key.

Conclusion

Adherence to PA during the pandemic was affected by fear of COVID-19 and the prolonged effects of social isolation. Healthcare providers must seek to provide individualised support, for the CRD population, addressing physical, mental and social health needs.

Introduction

In the U.K., approximately nine million people are living with a chronic respiratory disease (CRD), including asthma, chronic obstructive pulmonary disease (COPD), bronchiectasis and interstitial lung disease (ILD) (1). In comparison to those without, people living with CRD tend to be less physically active and spend more of their day sedentary; which is associated with increased risk of hospitalisation and mortality (2). Limited exercise capacity and increased breathlessness on exertion can lead to a vicious cycle of inactivity, deconditioning and increasing breathlessness (3).

Pulmonary rehabilitation (PR) is a programme of exercise training and education, which improves exercise capacity and reduces symptom burden in people living with CRD. PR promotes self-management and adherence to health-enhancing behaviours, including physical activity (PA), however sustained adherence to PA in daily life post-PR has not been demonstrated thus far (4). This may reflect the complexity of PA behaviour; with physical symptoms, emotions, environmental factors, motivation, peer interaction and opportunities to engage in PA being identified as key factors affecting PA adherence in some CRD populations (5, 6).

COVID-19 and PA

People living with CRD in the U.K. were strongly advised to shield between March and August 2020 due to heightened risk of severe COVID-19 (7). Whilst restrictions protected the most vulnerable, this likely had a significant impact on stress levels, and overall physical and mental health (8).

PA can be an adaptive coping strategy during periods of stress, however, the closure of recreation facilities and PR programmes, restricted opportunities to be active. Reductions in self-reported PA, and daily step count (compared to pre-pandemic) (9, 10).

Some evidence suggests people living with CRD have maintained a degree of physical and social isolation since the shielding period ended (11, 12); possibly attributable to ongoing fear, anxiety, and social isolation contributing to sustained reductions in PA (13).

Currently there is no published in-depth exploration of the personal experiences of people living with CRD during the pandemic; factors that may have affected PA during the pandemic are currently unknown. Exploring these factors may identify measures to support adherence to PA during the ongoing pandemic and beyond.

Aim

The aim was to identify facilitators and barriers to PA in people living with CRD during the COVID-19 pandemic. A secondary aim was to explore how this population can be supported to increase adherence to PA during the ongoing pandemic and beyond.

Method

Research design

A qualitative approach using interpretive phenomenological analysis (IPA) was used to enable an in-depth exploration of how individuals understand their own lived experiences. IPA was considered appropriate to address the aim in seeking to understand the experiences of people living with CRD and their associated interpretations (13).

Ethics

Ethical approval was granted by the University of Birmingham School of Sport Exercise and Rehabilitation Sciences Ethics Committee (EX2122_02).

Inclusion criteria

Individuals were eligible to participate if they were: (a) 18 years old or over (b) diagnosed with asthma, bronchiectasis, COPD or ILD, (c) living in the U.K., (d) able to communicate effectively in English, (e) able to participate in an online interview.

Exclusion criteria

Individuals were not eligible if they: (a) had a severe mobility impairment that were dependent on equipment for transfers, or (b) were a transplant recipient (due to their immunocompromised status).

Sample size

In keeping with the IPA approach, a small sample (up to ten participants) was sought to enable exploration of similarities and differences between each individuals' lived experience and detailed analyses of each individuals' experiences (13).

Recruitment

Convenience sampling was used to recruit participants from non-NHS support groups through online advertisements. With permission, the recruitment poster was distributed by email to Action for Pulmonary Fibrosis regional support groups and posted on U.K. Facebook support groups for people living with CRD. Participants provided informed written consent and were free to withdraw at any time.

Data collection

An online form was used to collect demographic information including age, diagnosis, time since diagnosis, and previous completion of PR programme prior to interview.

Semi-structured one-to-one interviews with the lead researcher via video conference, were used to gather accounts of each individual's PA experience throughout the pandemic. An interview guide (Table 1) was developed based on COVID-19 research and qualitative PA studies in CRD populations (5, 6, 11).

Table 1: Final interview guide.

Questions

- 1 Prior to COVID-19, what was your relationship like with physical activity?
- 2 What impact, if any, did COVID-19 have upon your relationship with physical activity?
- 3 Can you describe how the pandemic has impacted your physical activity?
- 4 What were/are your main concerns relating to COVID-19, and how do you feel those impacted your physical activity?
- 5 What impact did shielding have on you, and how do you think it impacted your physical activity?
- 6 How do you feel COVID-19 has impacted your ability to manage your condition?
- 7 What are your thoughts and feelings, with regards to your future physical activity, with COVID-19 still circulating in the community?
- 8 If the U.K. went into another lockdown, how would you maintain your physical activity?
- 9 What support do you think may help, with being physically active in the future?
- 10 What advice regarding physical activity, would you give to someone diagnosed with your chronic lung condition, during the pandemic?
- 11 Is there anything else you would like to add, that we've not covered?

Interviews took place between 4th January 2022 and 25th February 2022. To orientate participants to the types of PA being considered, the lead researcher provided a definition of PA and its domains; occupational, domestic, transportation and leisure time (14, 15). Each participant gave permission for the interview to be audio-recorded.

Data analysis

Demographic data is reported descriptively; numerical data is reported as mean and standard deviation (\pm SD).

Interviews were transcribed verbatim and member checked. Data triangulation was completed with two researchers: the lead researcher (SJ) and study supervisor (LG).

Analysis was divided into two phases as per IPA steps (13). During phase one, the lead researcher (SJ) familiarised themselves with each transcript on a case-by-case basis to immerse themselves in the data. Exploratory comments were recorded in the transcript margin. During phase two, SJ and LG independently reviewed the individual transcripts to interpret the meaning of each participant's experience and identify emergent themes. Patterns in emergent themes across all interviews were identified to produce master themes. SJ and LG met to discuss and reflect upon independent analyses and to agree on the final master themes and sub-themes.

Reflexivity

The lead researcher was a third-year undergraduate physiotherapy student at the University of Birmingham with practice placement experience of delivering community-based PR during the pandemic. Participants were not known to the lead researcher prior to the study. Trustworthiness of the research was optimised with use of a reflexive diary, data triangulation and an audit trail of results.

Results

Participant characteristics

Ten participants living with CRD were recruited to the study with a mean age of 57 ± 20 years; eight were female, further participant characteristics are presented in [Table 2](#). Average interview duration was 57 ± 11 minutes. All participants completed the study.

Table 2: Participant characteristics.

Participant	Age (years)	Gender	Diagnosis	Years since diagnosis	Completed pulmonary rehabilitation course
1	65	Female	COPD	16	Yes
2	32	Female	ILD	7	Yes
3	43	Female	Asthma	18	No
4	57	Female	ILD	4	No
5	27	Female	Asthma	26	No
6	62	Female	Asthma	62	No
7	71	Female	ILD	4	Yes
8	82	Male	ILD	2	No
9	87	Male	ILD	6	Yes
10	43	Female	Bronchiectasis	18	No

COPD = chronic obstructive pulmonary disease, ILD = interstitial lung disease.

Themes

Overall, the COVID-19 pandemic contributed to a self-reported reduction in PA amongst all participants that extended beyond shielding and restrictions. Five master themes were identified from the data (Table 3).

Table 3: Overview of master themes and subthemes.

Master themes	Subthemes	Supporting quotes
1 Fear of COVID-19.	<ul style="list-style-type: none"> Fearing the worst (-). Behaviour of family and friends (+/-). Safety precautions (+). Virtual support is the way forward (→). A forgotten group that needs support (→). 	<ul style="list-style-type: none"> 'Let's stay away from everything, then you can't get it' (<i>Participant 7</i>). 'That vaccine was my freedom' (<i>Participant 10</i>). 'Online is the right vehicle for it now...you don't have the risk' (<i>Participant 9</i>). 'There's still a group of us still feeling the after-effects we haven't moved on' (<i>Participant 10</i>).
2 Influence of government restrictions		<ul style="list-style-type: none"> 'I liked being stuck in the house because I felt safe' (<i>Participant 6</i>). 'I still feel isolated and detached from the world' (<i>Participant 10</i>). 'We know people who say things like you can't put your life on hold... I'm putting death on hold that's why you have to do this stuff' (<i>Participant 9</i>). 'It's difficult to work out what is safe now' (<i>Participant 3</i>). 'I'm not going in an enclosed space where most people aren't wearing a mask' (<i>Participant 10</i>).
3 Top priority or on the backburner	<ul style="list-style-type: none"> Protecting themselves (+/-). Ill health (-). Competing priorities (-). 	<ul style="list-style-type: none"> 'I want to get myself as fit as possible... in case I do get this horrible bug' (<i>Participant 6</i>). 'I felt like my life was being robbed and I weren't going to let it win' (<i>Participant 4</i>). 'Home schooling that literally was my sole attention... I was so exhausted' (<i>Participant 10</i>).

4 Reinforcing or reducing motivation	<ul style="list-style-type: none"> • Health benefits (+). • Enjoyment (+). • Adapted physical activity (+). • Peer support (+/-). • Mental health decline (-). 	<ul style="list-style-type: none"> • ‘When I was walking... I just felt connected with who I was again’ (<i>Participant 10</i>). • ‘Exercise is my drug of choice... it’s something that just makes me feel fantastic’ (<i>Participant 6</i>). • ‘With the mental health decline at that point physical activity was then minimal’ (<i>Participant 2</i>).
5 Personal context is key	<ul style="list-style-type: none"> • Prior knowledge (+/-). • Daily routine (+). • Goals (+). • Environment (+/-). • Support for minority groups (→). 	<ul style="list-style-type: none"> • ‘I found an app with tai-chi on, so I started to do that... I still do tai chi now’ (<i>Participant 4</i>). • ‘Gardening was another thing we did a lot of, that’s ongoing and become a great passion’ (<i>Participant 6</i>). • ‘We’re quite happy... to walk providing there aren’t too many people’ (<i>Participant 8</i>). • ‘It would be nice if there was a support group for young people... that do things that young people do’ (<i>Participant 2</i>).

(+) = facilitator, (-) = barrier, (+/-) = facilitator, barrier = (→).

Theme 1: Fear of COVID-19

This theme refers to fear associated with contracting COVID-19 that has dominated the participants lives since the pandemic began. In future, holistic support is required to address the physical, mental, and social impact of the pandemic.

1.1: Fearing the worst

All participants expressed their greatest fear was contracting COVID-19 due to the perceived negative consequences on their health. Many participants expressed prioritising survival over PA, felt they were restricted to indoor PA, and have still exercised caution with PA despite restrictions lifting.

1.2 Behaviour of family and friends

The pandemic has led to participants being selective with who they engage in PA with; they participate in PA alongside trusted friends and family members who they believed had been complying with the rules, or maintaining caution when restrictions lifted.

1.3 Safety precautions

Wearing masks, visiting places at quieter times and the vaccine rollout promoted feelings of safety and reduced worry amongst all participants who perceived it to facilitate PA.

1.4 Virtual support is the way forward

In future, the safest way of adhering to PA was perceived to be virtual support as there is no risk of virus transmission. Whilst some participants expressed virtual PA could not replicate face-to-face classes, from a motivational perspective.

1.5 A forgotten group that needs support

Participants living with CRD report the pandemic had a predominantly negative impact on their physical, mental, and social health. Despite restrictions lifting and society returning to normal, multiple participants did not feel able to return to *normal life*. In future some participants wanted subsidised PA schemes to increase PA access.

Theme 2: Influence of government restrictions

This theme refers to the importance of government restrictions, that were fundamental to protecting people living with CRD. The assurance provided by the restrictions reduced over time, and it was commonly perceived the public were not following the rules, which affected PA adherence.

2.1 Home is a safe place

Shielding was reported to reduce PA due to reduced opportunities and changes to the daily routine. During this time home was perceived as a safe place because they were in control. Some participants expressed they did not feel comfortable returning to normal and have continued with a modified daily routine.

2.2 Effects of social isolation

The long-term effects of shielding included reduced motivation and ongoing social isolation due to reduced confidence engaging with others, affecting daily activities and previous PA methods.

2.3 Are they taking this seriously?

After shielding had lifted, participants believed the public adhered to social distancing and wore masks that encouraged some to engage with PA. Over time relaxing of restrictions and perceived lack of understanding of the serious health consequences for those with CRD became a source of frustration for many, therefore some believed PA was too risky.

Theme 3: Top priority or on the backburner

This theme relates to prioritising one's health, with all participants' main concern being COVID-19. For some, PA became more of a priority than pre-pandemic, whilst others perceived returning to previous PA behaviours may compromise their safety.

3.1 Protecting themselves

All participants prioritised protecting themselves against the risk of COVID-19. Some people with ILD prioritised maintaining PA to slow disease progression. However, some participants expressed they were protecting themselves by not engaging with PA.

3.2 Ill health

Some participants reported acute exacerbations reduced their ability to remain active due to fatigue.

3.3 Competing priorities

Changes in circumstances such as home working and home-schooling children was suggested to reduce adherence to PA due to fatigue and reduced time available.

Theme 4: Reinforcing or removing motivation

This theme considers the importance of intrinsic motivation and its impact on PA. Intrinsic motivation contributed to adapting PA to incorporate virtual classes or digital applications. Lack of peer support and mental health decline contributed to reduced motivation for PA.

4.1 Health benefits

Participants that were motivated by the perceived health benefits of PA more frequently reported maintaining PA during the pandemic. Some participants adhered to PA as a coping strategy in response to the negative impact of the pandemic on their mental health.

4.2 Enjoyment

Participants who expressed they enjoyed PA and the way it made them feel, more frequently reported adhering to PA.

4.3 Adapted PA

During shielding, some made adaptations to their PA reflecting their intrinsic motivation to remain active. Adapted PA included attending virtual classes, using digital applications, starting or revisiting hobbies, such as baking and gardening that were continued after restrictions lifted.

4.4 Peer support

Some participants reported peer support as their main motivation to engage with PA, due to the sense of enjoyment and social support it provided, that could be incorporated into online classes.

4.5 Mental health decline

Declining mental health was suggested to reduce motivation to be physically active in the early stages of the pandemic, and whilst adjusting to shielding.

Theme 5: Personal context is key

This theme considers the importance of personal and environmental factors that affected the participant's ability to engage with PA, and highlights future support suggested by sub-groups of the CRD population.

5.1 Prior knowledge

Understanding the lung specific benefits of PA appeared to facilitate adherence to PA and education was typically through previous PR programmes.

5.2 Daily routine

Incorporating PA into their daily routine provided structure and alleviated boredom of shielding. Baking, walking, gardening, crafts, and tai-chi, were activities that participants initiated during shielding and became habitual over time.

5.3 Goals

Setting regular goals with the support of virtual classes, smartwatches or charity challenges, acted as facilitators to PA by enhancing motivation.

5.4 Environment

Physical surroundings influenced opportunities to engage in PA. Access to a private garden and living near public green space, was a facilitator to PA. However, crowded green space and limited indoor space were perceived barriers to PA.

5.5 Support for minority groups

Future support is required for minority groups within the CRD population, with suggestions including age-appropriate support and condition-specific support suggesting individualised support is required for underrepresented sub-groups of the population.

Discussion

To the authors knowledge, this study is the first to explore the barriers and facilitators affecting PA in people living with CRD, during the COVID-19 pandemic and the perceived support needed to adhere to PA during the ongoing pandemic. This should be considered in clinical practice, to support the mitigation of health implications associated with physical inactivity in this population (2).

Barriers and facilitators to PA

The results demonstrate self-reported PA decreased at the start of the pandemic, during shielding in keeping with other studies in people living with CRD during shielding (9, 10). Despite shielding ending and restrictions easing, in the present study people living with CRD reported maintaining caution in daily life, like avoiding overcrowded spaces and limiting contact with others which may have contributed to reduced PA.

The fear of COVID-19 reported in the present study appeared to be the greatest barrier to PA amongst participants. Fear of the unknown, severe illness and death were expressed, which is reported elsewhere (12). Psychological factors such as ability to cope, risk perception and anxiety are thought to contribute to COVID-19 related fear (16). People living with CRD are at risk of severe forms of COVID-19 (7) and may be more affected by fear and anxiety due to a higher risk perception (17), which is associated with safety related behaviour, previously linked to reduced PA adherence (10). The illness perception of people living

with CRD during the pandemic is likely to have shifted towards a disease-orientated illness perspective (18). Despite shielding ending and restrictions being eased the threat to people living with CRD was still present, and people with COPD reported maintaining a degree of isolation (11). Initially safety precautions were a facilitator to PA adherence but perceived non-compliance with safety measures by the public, promoted fear in people living with CRD that discouraged PA adherence.

Health was a priority during the pandemic for people living with CRD, however the reasons for PA adherence amongst participants differed by CRD. In the present study those with asthma had taken steps to manage their condition including adherence to PA, which is reported elsewhere (19). Whilst those with ILD linked PA adherence to slowing progression of ILD, however some were still avoidant of daily activities due to the perceived risk to their health. This demonstrates there are condition-specific and individual factors contributing to PA adherence, demonstrating the complexity of PA behaviour, where barriers and facilitators are closely linked with a multitude of factors influencing each other.

Future support

Individualised support for people living with CRD is required to counteract the negative effects of the pandemic on physical, mental, and social health. Minority groups such as the young and those with ILD may benefit from tailored support as it appears current support available does not meet their needs.

With COVID-19 still circulating in the community, virtual support was suggested as the most appropriate method of delivery for safety reasons. However further research is required to confirm the efficacy and role of virtual PR with consideration of acceptability and digital inequalities (20).

Limitations

Over time perceptions of a phenomenon change, therefore participants may be influenced by recall bias. The use of convenience sampling increases risk of selection bias, where those not represented by the study may have had different experiences.

Conclusion

In conclusion, this study was the first in the U.K. to identify factors that influenced adherence to PA throughout the pandemic, providing an in-depth insight into the CRD population's experience and the complexity of adhering to PA whilst living in a pandemic. Despite shielding and restrictions being lifted, people living with CRD report maintaining caution in their daily lives due to fear of COVID-19 and its perceived effects on their health. Reduced adherence to PA during the pandemic within this population has health consequences for the individual and for the NHS and must be addressed. This study raises awareness for healthcare professionals, and provides evidence when considering the physical and mental health of people living with CRD. In future individualised support is required to address the physical and mental health of the CRD population.

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