Women in Sport and Physical Activity Journal, **(Ahead of Print)**
https://doi.org/10.1123/wspaj.2020-0068

Human Kinetics
ARTICLE

Perceptions of Physical Activity Changes Due to COVID-19 Restrictions Among Women in the United Kingdom

Jacky J. Forsyth, Lorna Makay, and Victoria Riley
Staffordshire University

The purpose of the current study was to explore, via interview, how and why women felt their physical activity levels and active lifestyles had been affected by COVID-19. Telephone interviews were conducted with 23 women, aged between 28 and 52 years from a variety of socioeconomic backgrounds in the United Kingdom. Based on reflexive thematic analysis, the perceived reduction in exercise and the increase in sedentary behavior that many of these women experienced were felt to be a result of the physical restrictions imposed through gym and leisure-facility closure, the change in circumstance (both work and home life), the perceived risks associated with exercising during a pandemic, as well as a lack of peer support. In contrast, some women experienced increased opportunity and time to exercise, which they felt benefited their health. For any future pandemic-related restrictions, exercise practitioners should consider promoting exercise with others in a safe environment in order to ensure that women's healthy exercise and lifestyle behaviors are maintained.

Keywords: Coronavirus; lockdown; females; exercise

The COVID-19 pandemic has brought about unprecedented changes to people's lives and livelihoods across the world. Responses to the virus have been imposed by most countries, in order to curb the spread of the disease, with the most stringent measures, to date, including the ordering of individuals to stay-at-home, along with full closure of educational institutions, bans on public gatherings, and restrictions on movement and travel (Hale et al., 2020). Such measures have invariably had an impact on women's exercise and physical activity habits since restrictions have included the closure of; gyms and sports centers, mandatory bans on both indoor and outdoor gatherings, and closure of public spaces of any kind, including parks and recreational grounds (European Centre for Disease Prevention and Control, 2020). These physical restrictions, alongside social distancing requirements, have created barriers to physical activity and have led to the adoption of a more sedentary lifestyle (Ammar et al., 2020; Qin et al., 2020; Ruiz-Roso et al., 2020; Srivastav, Sharma, & Samuel, 2020). Remaining healthy through achieving the minimal requirement for physical activity is especially important during a pandemic, considering that physical inactivity and sedentary behavior are associated with a number of adverse physiological consequences, as well as an increase in all-cause mortality (Campbell & Turner, 2018; Löllgen, Böckenhoff, & Knapp, 2009; Narici et al., 2020). A lack of physical activity, due to imposed COVID-19-related restrictions, has also been found to be associated with a decline in mental health and well-being (Duncan, Avery, Seto, & Tsang, 2020; Lesser & Nienhuis, 2020; Pieh, Budimir, & Probst, 2020; Slimani, Paravlic, Mbarek, Bragazzi, & Tod, 2020). Investigating the reasons why physical activity levels decline may help with our understanding of how physical activity can be maintained in order to safeguard positive health.

There has been some previously published research to suggest that COVID-19 has impacted more adversely on women's physical activity levels than it has on men. For instance, the prevalence of insufficient physical activity was found to be much higher among women during the quarantine period in China in comparison to levels found in men (Qin et al., 2020). Among patients with diabetes in Spain, moderate intensity and total exercise time decreased, and sitting time increased among women at a greater level than it did among men (Ruiz-Roso et al., 2020). Women have been reported to be more burdened by depression, anxiety, insomnia, and by a reduction in quality of life, as a result of confinement through lockdown (Pieh, Budimir, & Probst, 2020), which may also contribute to the drop in physical activity levels. There is also early evidence to suggest that existing gender inequalities have become heightened due to COVID-19, through both reduced working hours and increased domestic chores and caring responsibilities for women (Collins, Landivar, Ruppanner, & Scarborough, 2020; WomeninSport.org, 2020), which could mean that women have less time to devote to maintaining a healthy lifestyle. In terms of employment, women tend to have jobs in care, health care, domestic work and hospitality, which, as well as increasing the economic burden and exposure to the virus for women (OECD, 2020), might also affect women's healthy lifestyle choices. Because perceived social and peer support are important exercise determinants for women (Edwards & Sackett, 2016; Lindsay Smith, Banting, Eime, O'Sullivan, & van Uffelen, 2017; Prince et al., 2016), social distancing guidelines might predispose women to be less motivated to exercise in comparison to men. Having a greater understanding of the experiences of women and the impact of COVID-19 on exercise and sedentary behaviors, through investigating the reasons for women's lifestyle changes, will allow guidelines to be created on how to maintain health and fitness during any future home confinement.

Because of the relative newness of COVID-19, the causes and consequences of the associated confinement and physical restrictions have yet to be elucidated through interview, since most published research on physical activity levels, to date, has been obtained through survey. Economic, cultural, and social impacts of COVID-19 might have predisposed women to a reduction in physical activity and an increase in sedentary behavior, but women's perceptions of how their physical activity levels have been

The authors are with the School of Life Sciences & Education, Staffordshire University, Stoke-on-Trent, United Kingdom. Forsyth (j.j.forsyth@staffs.ac.uk) is corresponding author.

impacted have yet to be determined. The purpose of the current study, therefore, was to address the following research questions through interview:

How do women feel their physical activity levels and active lifestyles are affected by COVID-19 and related restrictions?

How are the physical, economic, social, and cultural factors perceived to have affected women's physical activity levels and sedentary behaviors?

Method

Research Design

The study followed a qualitative phenomenological design through semistructured interviews to examine how women felt their physical activity levels and lifestyle had been affected by COVID-19 and related restrictions, as well as their perceptions on how physical, economic, social, and cultural factors affected their exercise and sedentary behaviors. A phenomenological approach was chosen as it allowed views of participants to be collected and for shared lived experiences to be described and analyzed through reflexive thematic analysis (Braun & Clarke, 2019; Creswell, 2013).

Study Participants and Recruitment/Selection Processes

An initial COVID-19-related survey was disseminated via social media outlets, the aim of which was to assess people's experiences of COVID-19, the impact it was having on their day-to-day lives, and their perception of the guidance being given. The survey (unpublished) ran from March 28, 2020 to July 15, 2020 and was completed by 2,987 adults. Women aged 18 years and older and less than 65 years (considered as being of working age and the target group for physical activity guidelines in the United Kingdom; Department of Health & Social Care, 2019), who had agreed to be contacted following this initial survey, were included in the current sample. Pregnant women or women who had given birth in the survey period were excluded (since this population was being looked at separately in another study). Following screening for eligibility, a purposeful sampling technique was used to represent a cross-section of ethnicities and socio-economic groupings (the latter based on the Index of Multiple Deprivation). A computer-generated sample of each ethnic and socioeconomic group was generated, so that 85 women (9% from a total of 949) were contacted via e-mail and invited for interview. This initial number was chosen to cater for dropout. Of those who were invited to be interviewed, 60 did not respond; one consented initially but dropped out not giving a reason; and another no longer wished to be involved in the study, also not giving a reason. The remaining 23 were fully informed of the study, both verbally and in writing, and gave their informed consent. This study was approved by the Institute's ethical review board.

Age of the participants interviewed ranged from 28 to 52 years ($M = 40.5$, $SD = 7.2$ years, 95% confidence interval [37.4–43.6 years]). Prior to lockdown, participants reported their employment status as employed full-time ($n = 11$), part-time ($n = 8$), unemployed ($n = 1$), self-employed ($n = 1$), looking after the home and/or family ($n = 1$), and student ($n = 1$). During the initial lockdown period, 14 of those interviewed reported changing their usual pattern of work to working from home. Two participants had been furloughed (which, in the United Kingdom, was a temporary provision for employers to keep employees on the payroll without them working, paid at 80% of current salary, or up to £2,500), and a further four of those interviewed reported earning less due to COVID-19. All participants were residing in the United Kingdom, 22 living in England, and one living in Scotland. The majority ($n = 19$) defined themselves as White British, two as Asian British, one Black British, and one mixed race, which is approximately representative of the U.K. population (Office for National Statistics, 2011). The majority of participants ($n = 15$) had one or more children aged less than 18 years living in the household, with five of these having additional caring responsibilities in terms of caring for a family member. Only one of the participants lived alone. One participant who did not have children at home reported having caring responsibilities. Six participants reported as suffering from one or more health conditions and three were shielding (individuals identified as being clinically extremely vulnerable).

The Index of Multiple Deprivation and the Scottish Index of Multiple Deprivation are official measures of relative deprivation based on postcodes in England and Scotland, respectively, using seven domains. From the Scottish Index of Multiple Deprivation, deciles are calculated by ranking the neighborhoods from the most deprived (Rank 1) to the least deprived (Rank 10) and dividing them into 10 equal groups. The majority (28.6%) of participants were in Rank 4, but a full range was represented in the sample, from Rank 1 ($n = 3$) to Rank 10 ($n = 1$).

Data Collection

Interviews were carried out between July 15, 2020 and August 31, 2020. This timeframe covers the first-wave, post-lockdown period in the United Kingdom, which commenced from March 22, 2020 and eased gradually as the rate of infection decreased. From the outset, the U.K. government encouraged individuals to go outside to exercise once a day, which increased to allow unlimited exercise outside of the house on May 13 (May 11 for Scotland). On May 13, people who were unable to work from home were urged to go back to work, while maintaining social distancing. There was a phased return to school and a reopening of nonessential shops, bars, and restaurants between June 1, 2020 and July 15, 2020. Outdoor pools were allowed to reopen on July 11 (May 29 for Scotland), and indoor gyms, pools, and leisure centers could reopen on July 25 (August 31 for Scotland), apart from in specific areas where there were still local restrictions in place. The interviews, therefore, span a time that covered the easing of restrictions but were close enough to the stay-at-home, full lockdown restrictions for recall.

All interviews took place via telephone, apart from one, which took place electronically, as the individual was outside of the United Kingdom at the time of the interview. The topics explored were on COVID-19-related changes in (and perceptions of) exercise, physical activity, sedentary behavior, and relevant related lifestyle factors specific to women. A topic guide (Table 1) was used to ensure that all topics were covered but was designed to be open and flexible to account for different experiences. In the initial survey, participants had the opportunity to give open-ended responses and those relating to the population group selected were drawn upon when creating the topic guide to ensure that the questions were appropriate and reflected participant experience. At the end of each interview, the topic guide was checked to ensure that all areas had been covered. Interviews were held for 14–36 min, with an average interview time of 24 min. Interviews were audio recorded using a Dictaphone, and data were transcribed verbatim.

Table 1 Topic Guide

Topics included
Introduction to self and current employment
Domestic and caring responsibilities, e.g., any changes experienced to domestic roles due to COVID-19, and reasons why these were thought to have occurred
Exercise/physical activity/sedentary behavior, e.g., feelings about COVID-19 and its impact, with prompts for reasoning
Job situation/home environment and thoughts about how exercise/physical activity patterns were affected, with prompts for explanation
Concerns about medical or health status and associations with exercise/physical activity patterns, with prompts for explanation
Thoughts on how any of the above impacted health

Data Analysis

Data collected were analyzed using reflexive thematic analysis (Braun & Clarke, 2006, 2019), following the six-phased process. Authors were fully immersed in and familiarized with the data, in order to generate codes, created using NVivo 12 Pro. Codes were developed from the data, then reflected on, renamed, and collated. Codes were used to generate initial themes, which reflected broader patterns of meaning in the codes. Themes were then revisited, reflected on, and refreshed. Both authors reviewed and reconstructed themes several times, working collaboratively, with an audit trail maintained to highlight discussions, reflections, and discrepancies (Nowell, Norris, White, & Moules, 2017). The researchers also challenged each other in terms of their preexisting ideas, values, thoughts, and theoretical knowledge (Smith & McGannon, 2018). Themes were, hence, renamed, split apart, collapsed together, moved around, and abandoned, where necessary, to generate themes with a shared meaning. The final themes constructed were based on meaningful and coherent patterns in the data. The approach taken was inductive, semantic, and essentialist. Extracts were selected to reflect the themes and subthemes, with pseudonyms applied at this stage.

Approaches to Inquiry

Regarding positionality, the researchers belong to a center within a university, the purpose of which is to reduce health and social inequalities and improve the health and well-being of the local population. The researchers reside in the United Kingdom, are physically active, and approach research from an interactionist and feminist perspective. The first author is an associate professor (of exercise physiology), the second author is a PhD student and exercise facilitator, and the third author is a research associate.

Methodological Integrity

Methodological integrity is described in relevant sections above. In summary, adequacy of the data was achieved through capturing diversity using open-ended discussions and through collecting descriptions from participants regarding shared experiences on topics relevant to the research question. The process of reflexive thematic analysis enabled researchers to be fully and deeply immersed in the data. Codes and themes were revised several times through researcher collaboration, being conscious of subjectivity and positionality. Researchers' perspectives were, therefore, considered in the data analysis process. Code and theme development were fluid and organic to allow for themes, which had a shared meaning, to be actively developed and creatively interpreted. Quotes from the data were extracted to provide evidence of findings.

Findings

The number of participants in the sample gave sufficiently rich data to address the research questions. Five themes were generated from the data. The first four of these five themes were about the factors that were perceived to have affected physical activity and exercise levels, which included the following: physical restriction, change in circumstance, risk perception, and social factors. The fifth theme was about how exercise and lifestyle changes were thought to have impacted health. A summary thematic map of the main themes is given in Figure 1.

Physical Restriction

"Physical restriction" relates to how the national lockdown and subsequent easing of restrictions affected the women's exercise and physical activity. All the women referred, in some way, to this aspect. Two subthemes were discussed, one which is based on the mode of exercise/physical activity that had been changed due to COVID-19, "exercise modality changes," and the other, which focused on how there had been an increase in sedentary behavior and a noticeable drop in activity as motivation to exercise waned, "impact on sedentary behavior."

Exercise modality changes. Regarding "exercise modality changes," walking had been adopted by all of the women as part of their one form of daily exercise, which was something that was encouraged by the U.K. government at the outset of stay-at-home restrictions (U.K. Government, 2020): "So, we would go for our one walk a day religiously to get us out of the house" (Paige); but walking was also used as the predominant form of exercise to replace other exercise that was prohibited due to facility closure among those who were exercising pre-COVID-19: "So, instead of the gym, I've probably been going on a walk a day" (Carla). Some were motivated to continue with walking as the restrictions were lifted " . . . we're doing the family walks. As much as I love it, I do get shattered from it, but I'm determined to keep going now because I've found that little bit of fight in my belly" (Christina). It was not that walking, or step count, had increased particularly: "Step count is horrendous. I was doing probably between 15,000 and 17,000 steps a day before lockdown and now I'm lucky if I do six . . . and that's even with a walk" (Gabrielle). It was more that the women had walked because it was the only form of exercise possible at that time. The exception to the increase in leisure-time walking as a form of exercise was for three individuals (Laura, Jackie, and Tricia) who were shielding and were consequently restricted to walking around the house "... [exercise] went from being allowed to go out and about whenever I wanted . . . to all of sudden being told you're basically stuck in the house" (Laura), and for another

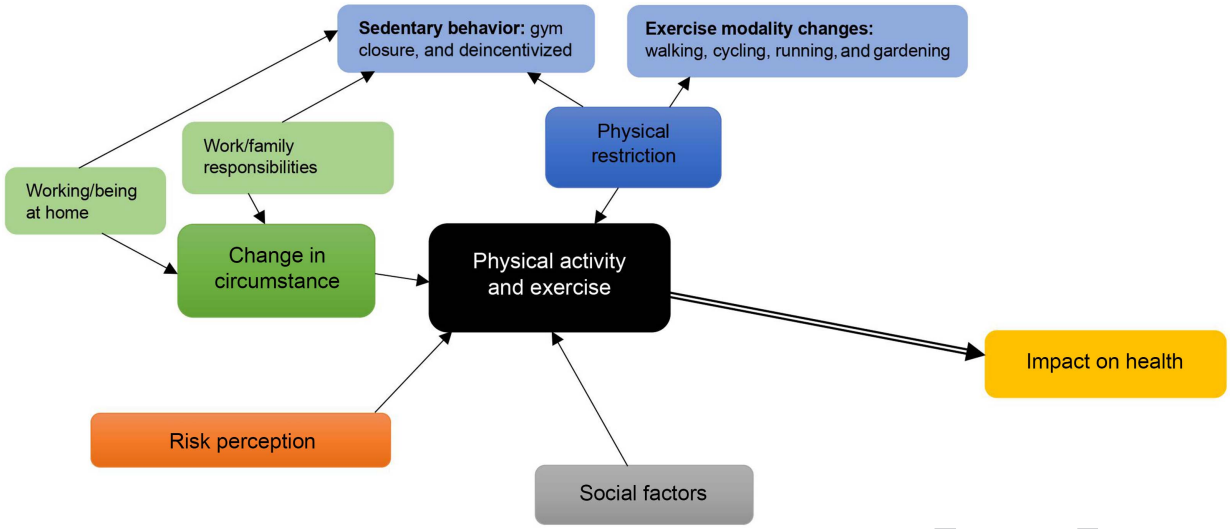

Figure 1 — Thematic map of themes and subthemes. The arrows reflect the direction of the influence. The themes of physical restriction (i.e., how restrictions imposed through COVID-19 lockdown had been felt to have altered sedentary behavior and exercise mode), changes in circumstance (work and family changes), social factors (interactions with others outside of the family home), and risk perception were factors that were perceived to have impacted physical activity and exercise behaviors. Change in circumstance also impacted sedentary behavior. The theme, impact on health, was about how the other four themes were perceived to have influenced physical and mental health.

individual who could not find anywhere appropriate to walk in their neighborhood:

> . . . so, I would normally have gone for the park. But everybody is going to the park for a picnic, so all of those dog-walking options are not available. So, they are getting just walked around the estate, which is full of glass, so I am quite restricted on that. (Trisha)

Other modes of exercise adopted by participants were cycling and running, which had been taken up as new forms of activity, again, as a replacement form of exercise owing to leisure-facility closure: "My bike's been in the shed for I don't know how long before lockdown. I just decided to get it out and do that instead of going to the gym" (Gabrielle). Gardening was also something that some participants talked about as a result of the stay-at-home restrictions, with this activity generally having increased.

Sedentary behavior. The other subtheme under physical restrictions was concerning the impact on sedentary behavior. There was an awareness that avoiding leisure-time sedentary behavior, such as sitting, was important for enhanced health and that it was not just about exercise per se. Sitting down, whether that was due to an increase in television watching, reading, online shopping, crafting activities, or because of a general lack of motivation was felt to have increased by many of the participants:

> You sort of wake up, you would sit down in the school room with them, you would do other stuff in the afternoon and cook. And then you would sit and watch TV in the evening. Actually, I have been sitting all day long. (Heather)

Owing to pool and sport facility closure, and due to bans regarding travel and gatherings of more than six people, which impacted sports clubs and events such as "parkrun" and walking groups, most of the women said that restrictions had brought a total cessation of pre-COVID exercise due to facility closure, which emphasizes how much this group of women depended on classes, equipment, or facilities for their weekly exercise:

> . . . swimming at least once a week if we could and all of that has stopped as well. So basically, all of the active—what I think of as active exercise, where you actually are specifically out doing it—that all went. (Trisha)

Sedentary behavior was, therefore, felt to have increased, since gym and facility closure had brought an abrupt halt to usual structured exercise behaviors.

Even though individuals had a changed routine regarding walking, cycling, running, and gardening, the women suggested that their initial incentive and enthusiasm for such exercise, felt at the start of the lockdown period, had "fizzed out" (Danielle), "fallen by the wayside" (Femi), "tailed off" (Laura), "very much dipped off" (Lauren), as the physical restrictions persisted: "We were just really good at the beginning. We had great intentions. And then other stuff sort of got in the way" (Heather). This lack of motivation contributed to the sedentary behavior.

Change in Circumstance

Working/being at home. "Change in circumstance" refers to how work patterns and family responsibilities, which had changed due to COVID-19, had impacted physical activity and exercise levels. Such responsibilities were specific to the individual. For instance, work patterns varied from those who had been furloughed or were working from home, to those who had continued to go into work. Family responsibilities were also individually specific. Unlike the theme of "physical restriction," therefore, this theme was more dependent on changes that were unique to subgroups of individuals, rather than factors that were common to most. A large proportion of the women said that they had become more sedentary due to having to work at home: "I would be traveling to work every day, traveling back and plus, for my job, I would be here, there and everywhere, across the city and I have just been quite stagnant"

(Barbara). There was a general dissatisfaction with the amount of time spent sitting and working on the computer:

> But even, sort of the walk to and from the office, from the carpark, that obviously helped keep my step levels up during the days, but at the moment it is pretty dismal. I do hardly anything at all . . . . I stay there, I generally don't move, unless I am going into a room, or making a drink. I don't move until I have finished for the day . . . when I am working, I am on the screen all the time, because there is nothing else for me to do. Everything is online. (Jasmine)

A few participants (Gabrielle, Lisa, and Zara) said they deliberately did exercise or stretching to counter the sedentary activity that was imposed on them due to their work arrangements:

> I think the kind of exercise I got in work meant that I didn't really need to go to the gym or things like that or need to actively think about it, whereas I'm not getting that now, so I do need to actively think about it. (Lisa)

A change in work circumstance had, therefore, resulted in a degree of frustration about being sat in front of a computer all day, prompting countermeasures to relieve this altered, more sedentary working environment.

Work/family responsibilities. A number of women said that they had too much work or family responsibilities, which restricted their exercise. Those who mentioned work in particular (Charu and Lauren) explained that they were still in full-time employment outside of the house, owing to them being key workers (those for whom work was critical to the coronavirus response). Other women mentioned either having to care for a family member or for a child, which meant they did not feel they had the time or motivation to exercise: "I think one thing is the kids. So, I keep focusing on their needs, and also focusing on my work, then focusing on my physical activity. It is too much" (Femi). For these women, a change in circumstances had created barriers of time and lack of motivation.

In contrast, women who had been furloughed and/or did not have caring responsibilities felt they had more time and opportunities to exercise and be active, leading to concern about having to return to their previous, more hectic lifestyles. Not having to commute or do the school run freed up time for these women:

> When I am back in work physically, I am going to miss this opportunity of doing exercise when I feel like it . . . . I try to make sure I do something five times a week, but I won't be able to do that when I am back at work. There is no way with the travel and everything else you've got to do. I do feel COVID has given me this opportunity to actually exercise and spend the time at home that I wouldn't have had. And I can't knock it. I am quite enjoying it, to be honest. (Zara)

One woman (Sarah) explained how she had her husband at home, who shared the childcare, which "made it easier" to go and do exercise whenever she wanted to, while another woman said that she was restricted by space to do exercise:

> We don't have the biggest garden . . . there is not much that I could do in the garden. It's also not very private so even if I was inclined and had the space, home workout in the garden wouldn't be a thing . . . home workout in the house is probably not a thing because . . . there is just no space, or privacy to sort of do any physical exercise in the house. (Trisha)

Changes in individual circumstance, therefore, had a differential effect on exercise behaviors, varying from those who had experienced an increase in time spent sitting at a computer, which either made them more sedentary or forced them to move more to counteract being deskbound, through to individuals whose circumstances had changed to such an extent that time for exercise had become either more restrictive or abundant.

Risk Perception

This theme was about how women expressed anxiety or concerns regarding COVID-19, which, in turn, influenced their exercise and physical activity behaviors. Some women expressed anxiety about going out of the house, even to go walking in open spaces, due to having to walk past others, because of other people acting irresponsibly and because of the potential to run into too many people, all of which make them feel uneasy or unsafe. For those women considered "high risk," leaving the house had become debilitating: "I'm terrified to go outside" (Laura). There was also concern expressed regarding going back into a gym environment or to a swimming pool, as these had started reopening at the time of interview. Concern was based on similar reasons as for not leaving the house per se, such as apprehension that the women would not be able to socially distance due to spaces being overcrowded, but also because of feeling that having to touch potentially infected surfaces was an unnecessary risk that they were not prepared to take:

> I would still not yet be comfortable to return to a gym and believe that is still unsafe and increasing the chances of spreading the virus even further. So, for the time being, I will continue to exercise from a safe space. (Anjika)

Yet, others were happy to return to gym-based exercise since they were confident that the necessary procedures were in place: "I would be more than happy to go back to class . . . . I'm not really worried about catching it" (Elizabeth). Perceptions of risk appeared to range from those who were extremely anxious to those who were fully confident. This range might have partly been related to innate feelings of anxiety but was also related to how vulnerable the participant believed themselves to be, as well as how much experience the women had had, at the time of interview, with social engagement, from those who had not yet left the house to those who were outside the house often.

Social Factors

Many of the women said that they missed the social side of exercise:

> The main effects of lockdown have been like the social side for me, so even exercise going to the gym is quite a social thing for me as I go with two of my friends. So, I think that's sort of the main impact lockdown has had on me is not actually having that contact with people. (Carla)

The social side of exercise was described as the interactions the women had between themselves and others outside of the family home. These interactions could have been with friends, or, in the case of a gym environment, with other class members and the instructor. The lack of opportunity to socialize with people outside the home had generally made the women less motivated to

exercise, or to exercise less often or with less intensity, with the women specifically saying how they were motivated by exercising with another person, as they had jointly committed to a specific exercise time:

> I'm not very good at ... committing to exercise regularly on my own .... Just a lack of discipline. Whereas if I'm doing it with somebody else or it's an actual event, it makes me more kind of diligent to attend it .... I like to exercise socially with people. (Elizabeth)

The lack of social interaction adversely affected engagement with and enjoyment of online classes, in particular, with individuals commenting that they felt as though they needed the face-to-face contact with the instructor or trainer to feel both motivated and safe:

> Although I don't have to get myself to the gym and can get started much easier from home, I do still think I got more out of the exercise I did when the gym was open. I have also struggled without having a trainer to motivate me. Watching workout videos are helpful but I don't find them as effective. (Anjika)

> I'm trying, but it's definitely less ... even the Pilates. Although I'm happy to be doing it, it's not as good. My teacher is quite hands-on. Obviously, I'm doing it on my own .... I'm assuming I'm doing it correctly because you can see a little bit around, but she [the teacher] can't physically correct you. So, it's definitely different—not as enjoyable. If I've got bad technique, if I'm doing it wrong, I'm doing it wrong all the time then. (Danielle)

The need to socialize was a clear motivator for exercise, and when not as available face to face, the passion for exercise and the safety that was felt, as a result of working out with others, waned.

Lifestyle Effects on Health

The theme "lifestyle effects on health," in comparison to the previous four themes, was not about how factors impacted exercise, but about how exercise and lifestyle changes were perceived to have impacted personal health. Most of the women coded in this category commented on how they felt that their health had worsened due to a lack of physical activity. In some instances, their sedentary behavior, lack of mobility, and a decline in fitness levels had aggravated a preexisting condition, such as a previous injury or illness: "I find when I'm more mobile, it [Lupus] is easier to cope with" (Jackie). As well as this physical deterioration, a lack of physical activity was felt to have had an adverse effect on the women's mental health:

> I have a stick now because I've had some muscle degeneration in my legs due to COVID, cos I had a bad knee, but because of ... certain indoor exercises that you're not supposed to do. So, the whole COVID thing made my health kind of deteriorate like my mental health, physical health, everything. (Carla)

In addition, a number of the women expressed concern over their weight gain: "... definitely put about half a stone on cos I've been eating more, cos I'm walking more and I'm more hungry" (Carol). The weight gain, although not having explored dietary factors in detail, such as meal composition, the women felt that their weight gain was a result of a combination of reduced exercise/physical activity and an increased calorie intake due to, for instance, an increase in processed or convenience food.

In contrast, for some women, their physical and mental health had improved due to lifestyle and exercise changes, especially if they had taken up exercise or had gained more time to relax:

> So, I think it has—that I've been able to do physical exercise—has definitely helped with my anxiety and the depression and I think if I hadn't been able to sort of go out and have that space, it could have had quite a detrimental effect. (Kelly)

That said, two of the women (Kelly and Sarah), who had taken up running, although seen as being advantageous for improving fitness, at the same time complained of running-associated injuries that had developed. Whether physical and mental health had improved or deteriorated was, therefore, dependent on the individual, and how they had felt that COVID-19 and the resultant physical restrictions, change in circumstance, risk perception, and social factors, had impacted their lifestyle.

The themes provide an overall commentary of the women's perceptions of how COVID-19 impacted their physical activity, exercise, and health but do not quite capture the diversity that was within the population sampled, owing to individual-specific changes in circumstance. For instance, feelings ranged from being "helpless," "very depressed," "miserable," "anxious," and "upset" (Gabrielle, Laura, Dina, Danielle, and Charu), due to COVID-19-related changes in personal circumstance, to "positive," "happy," and "relaxed" (Zara, Elizabeth, and Carol). There were also a couple of women whose relatives had died of COVID-19, which had affected their lifestyle choices. These individual differences came out in the themes on risk perception and on how lifestyle and physical activity impacted physical and mental health.

Discussion and Implications

How and why physical activity and exercise levels were affected by COVID-19 were explored with a group of women residing in the United Kingdom. The focus was on women, owing to findings that women's physical activity behaviors had been more adversely affected during restrictions (Qin et al., 2020; Ruiz-Roso et al., 2020). Feelings and explanations regarding change in behavior in the current study were found to center around the themes of physical restriction, change in circumstance, risk perception, and social factors. A further theme revolved around how exercise and lifestyle change was perceived to have impacted health.

In the United Kingdom, from March 23, 2020, the government imposed restrictions, commensurate with those enacted elsewhere. These physical restrictions were still being imposed, with some easing, at the time of interview in the current study. The theme of "physical restriction" was about how the restrictions imposed by COVID-19 had impacted the type and intensity of exercise, as well as sedentary behavior and incentive to exercise. There was specific encouragement from the U.K. government to go outdoors for exercise, albeit just once a day (U.K. Government, 2020). Other countries, such as Belgium and Portugal, also highlighted the need for exercise as part of their agenda for ensuring that people remained healthy, both mentally and physically (International Sport and Culture Association, 2020). Exercising outdoors, during times of restriction, has been specifically related to an increase in well-being (Lesser & Nienhuis, 2020), and contact with natural outdoor environments, in particular, is associated with better mental health (Triguero-Mas et al., 2017; Watson et al., 2020;

Zijlema et al., 2017). In the current study, there was a sense that the opportunity and encouragement to exercise and spend time outdoors, which included walking, cycling, running, and gardening, was a positive outcome of the lockdown restrictions.

Although such outdoor exercise was perceived to be mainly positive, this form of exercise was generally used as a replacement for previous exercise undertaken that required facility or equipment use, and, therefore, the intensity might have been reduced considerably, an important requirement for maintaining cardiovascular health (Ashor et al., 2015; Samitz, Egger, & Zwahlen, 2011; Sattelmair et al., 2011). In fact, in the current study, leisure-time sedentary behavior was largely thought to have increased, which is, of concern, as sedentary behavior is associated with various chronic disease states (Patterson et al., 2018). In addition, the initial incentive for exercise that was felt at the start of the lockdown period seemed to have waned as the physical restrictions persisted. Although exercising outdoors and spending time in natural environments were generally thought of as being positive, the reduction in intensity of exercise and the increase in time spent in leisure-time sedentary activity might predispose these women to worsened health in the future.

Many of the women cited social factors as being an important element to their motivation to exercise, which they said they had missed, because of COVID-19 restrictions. Online classes were felt to be particularly lacking in this respect. In a systematic review of older adults, social support related to physical activity was found to be associated with physical activity levels, especially when the social support came from family members (Lindsay Smith et al., 2017), although, in the current study, it was the social support of individuals outside of the family home that was considered to be of importance. As a result of home confinement in the study of Ammar et al. (2020), the negative effect on social participation, which included socializing with others through exercise, was linked to a reduction in life satisfaction and psychological well-being. If future home confinement occurs, having that social support network, and not just through providing substitute online exercise classes or by only allowing exercise with family members, needs to be prioritized if women are to remain above the recommended minimal guidelines for physical activity.

As well as leisure-time sedentary behavior thought to have increased in the current study, sedentary work-related behavior had also increased, due to a change in circumstance, namely a shift from commuting to and being at a physical work location to working from home, or due to increased family responsibility. In the study of Ammar et al. (2020), 29% of their sample reported sitting for 6–8 hr a day during confinement, and the percentage of individuals who sat for more than 8 hr per day increased from 16% to 40% (Ammar et al., 2020). Working from home and being at home, although resulting, for some of the women, in increased sedentary activity time and an increase in time spent sitting at a computer, for others, working from home allowed for more time and opportunity to exercise, a finding also reported by others (Lesser & Nienhuis, 2020; WomeninSport.org, 2020), owing to having a more flexible lifestyle. Differential findings regarding how the women perceived the new stay-at-home arrangements were largely down to individual circumstances. Avoiding sedentary behavior in both leisure and through work is important to consider, however, in any future pandemic confinement, by acknowledging that this occurs in a pandemic, and that exercise needs to be encouraged to ensure improved metabolic health and fitness (Patterson et al., 2018).

Weighing up the perceived risks and benefits of an activity is often a key component of behavior change models (Ferrer & Klein, 2015), which resonates with the current study's theme of "risk perception." An individual's perceived susceptibility to risk when exercising is likely multifactorial, being dependent on cultural beliefs as well as sociopsychological factors (Lohiniva, Sane, Sibenberg, Puumalainen, & Salminen, 2020). For instance, in the United Kingdom, vulnerable groups of individuals have been found to be more likely to express concerns about risk of COVID-19, and, in turn, vulnerability and risk concerns have both been found to be related to a reduction in intensive physical activity (Rogers et al., 2020). Similarly, in the current study, perceived risk seemed to be more heightened among the "high-risk" participants, which might have led them to reduce exercise engagement or the intensity of exercise. Concern was also expressed, by some of the women, about returning to the gym, due to both fears about not being able to appropriately distance, but also regarding the sanitization of facilities. Perceived crowding of leisure facilities has been found to reduce the enjoyment of exercise due to fears about risk of infection (Kim & Kang, 2021). If an intervention can change risk perception, behavior is also more likely to change (Sheeran, Harris, & Epton, 2014). Improving exercise spaces, so that women feel safer and more comfortable to exercise is, therefore, an important target to ensure continued positive exercise behaviors.

Perceptions regarding physical restriction, change in circumstance, social factors, and risk perception were found to be intertwined with an individual's physical and mental health. In previous research on COVID-19, lack of physical activity due to restrictions was reported to lead to a deterioration in physical and mental health (Ali & Kunugi, 2020; Lesser & Nienhuis, 2020; Slimani, Paravlic, Mbarek, Bragazzi, & Tod, 2020). However, in the current study, the findings were not as straightforward and concluded that an increase in physical activity improved physical and mental health and vice versa. Other factors contributed to feelings of physical and mental health, such as exercise-related injury, dietary changes, and general feelings of COVID-19-related anxiety.

A limitation of the study was that it was confined to a sample of U.K.-based individuals during the early stages of the COVID-19 pandemic. It is likely that physical activity levels will vary according to individual government confinement policies (Ammar et al., 2020), although there are some take-home messages from the current study, such as an increase in sedentary behavior, a reduction in exercise intensity, and a sense of missing the social side of exercise that are supported by research on COVID-19 and exercise carried out to date. The high percentage of individuals who declined to participate in the interviews might reflect the anxiety felt regarding exercise levels and might have brought a degree of distortion into the sample. That said, there were enough women in the sample who expressed feelings of low mood, anxiety, and a lack of exercise of any sort, to those who had exercised intensively and consistently to be representative of the general U.K. population. A further limitation was that the sample only included those who had access to the Internet; digital exclusion would mean that the sample consists of those who are generally more educated, less likely to be unemployed, disabled, and less socially isolated (Helsper & Reisdorf, 2017). Although an attempt was made, through purposeful sampling, to gather information from a range of ethnic and socioeconomic status groups, which was a strength of the study, it was also a limitation in that the sample was somewhat diluted. It could, therefore, not be ascertained as to whether there were disproportionate impacts of COVID-19 according to deprivation ranking and ethnicity. Findings should, therefore, be considered within the context in which they were obtained, being at a particular time in the United Kingdom, from a U.K. demographic. A strength

of the study was that the interviews were conducted in the period spanning a country-wide lockdown into the easing of restrictions. Recall bias was, therefore, minimized by focusing on how the participants felt at the time of interview. A further strength of the study was the purposeful and random selection of the population from the initial survey.

Implications for Practice

The findings of the current study are important because they provide a greater insight into why exercise levels might decrease to a greater extent in women compared with those in men during a pandemic like COVID-19. Women might be willing to engage in forms of more intense exercise, other than walking and gardening, if the social side of exercise in a safe environment can be provided. The message about decreasing sedentary behavior, especially with prolonged periods of working and being at home, could also be addressed by public health advisors. The findings could be applied to individuals who are restricted for other reasons, such as a result of long working days in an office and due to home confinement necessitated by illness or childcare, since workplace wellness programs to reduce sitting time have been found to be effective (Pereira et al., 2020).

It is possible to use an ecological model of health behavior to understand the impacts of COVID-19 on women's physical activity since there appear to be multiple, interrelated factors influencing physical activity, such as interpersonal, intrapersonal, and imposed government policies (Sallis, Owen, & Fisher, 2008). Drawing on this ecological model, therefore, the themes developed from the data reflect influences of policy ("physical restriction"), perceived environment ("risk perception"), behavior and behavior settings ("change in circumstance"), and intrapersonal influences ("social factors"). To be effective in improving physical activity behaviors, from an ecological perspective, then, practitioners should consider a multiple approach to increasing or maintaining physical activity levels for women during a pandemic. Although restrictions due to COVID-19 are necessary, policy changes at the government level should reflect the desire, from women, for social interaction, by providing a safe environment in which social distancing can be maintained. For instance, opportunities could be provided for women to exercise together through the provision of large open spaces, such as outdoor gyms, where perceptions of risk can be minimized. Restricting travel could be avoided, where safe to do so, to allow women to socialize further afield.

Conclusion

The aim of the current study was to explore, via interview, perceptions of how stay-at-home restrictions due to COVID-19 in the United Kingdom had impacted exercise and physical activity behavior in women and subsequent feelings of health. The physical restriction that was imposed due to COVID-19 was felt to have directly impacted exercise behaviors, by changing the type (and therefore intensity) of exercise undertaken and by increasing sedentary behaviors. Motivation to exercise was also felt to have been affected since the women missed the social element of exercise and, to some extent, because of how they perceived risk. Because of the diversity in experiences, from those women who had found themselves in a situation of increased leisure time to those who had added family responsibility on top of continued work, there were differences in how these women responded in terms of their activity levels.

The study has implications for practice because understanding the barriers and determinants of exercise among women during a pandemic can help to ensure that women maintain the minimum amount of physical activity to engender positive health. The public health message for women, therefore, based on the current findings, is to remove as many of the physical barriers as possible, to promote appropriately socially distanced exercise, with others, and to provide opportunities for safe exercise.

References

Ali, A.M., & Kunugi, H. (2020). COVID-19: A pandemic that threatens physical and mental health by promoting physical inactivity. *Sports Medicine and Health Science, 2*(4), 221–223. doi:10.1016/j.smhs.2020.11.006

Ammar, A., Brach, M., Trabelsi, K., Chtourou, H., Boukhris, O., Masmoudi, L., … Hoekelmann, A. (2020). Effects of COVID-19 home confinement on eating behaviour and physical activity: Results of the ECLB-COVID19 International Online Survey. *Nutrients, 12*(6), 1583. doi:10.3390/nu12061583

Ashor, A.W., Lara, J., Siervo, M., Celis-Morales, C., Oggioni, C., Jakovljevic, D.G., & Mathers, J.C. (2015). Exercise modalities and endothelial function: A systematic review and dose–response meta-analysis of randomized controlled trials. *Sports Medicine, 45*(2), 279–296. PubMed ID: 25281334 doi:10.1007/s40279-014-0272-9

Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology, 3*(2), 77–101. doi:10.1191/1478088706qp063oa

Braun, V., & Clarke, V. (2019). Reflecting on reflexive thematic analysis. *Qualitative Research in Sport, Exercise and Health, 11*(4), 589–597. doi:10.1080/2159676X.2019.1628806

Campbell, J.P., & Turner, J.E. (2018). Debunking the myth of exercise-induced immune suppression: Redefining the impact of exercise on immunological health across the lifespan. *Frontiers in Immunology, 9,* 648. PubMed ID: 29713319 doi:10.3389/fimmu.2018.00648

Collins, C., Landivar, L.C., Ruppanner, L., & Scarborough, W.J. (2020). COVID-19 and the gender gap in work hours. *Gender, Work & Organization, 28*(Suppl. 1), 101–112. doi:10.1111/gwao.12506

Creswell, J.W. (2013). *Qualitative inquiry and research design: Choosing among five approaches*. (3rd ed.). SAGE Publications.

Department of Health & Social Care. (2019). UK Chief Medical Officers' physical activity guidelines. Retrieved from https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/832868/uk-chief-medical-officers-physical-activity-guidelines.pdf

Duncan, G.E., Avery, A.R., Seto, E., & Tsang, S. (2020). Perceived change in physical activity levels and mental health during COVID-19: Findings among adult twin pairs. *PLoS One, 15*(8), e0237695. PubMed ID: 32790745 doi:10.1371/journal.pone.0237695

Edwards, E.S., & Sackett, S.C. (2016). Psychosocial variables related to why women are less active than men and related health implications. *Clinical Medicine Insights: Women's Health, 9*(Suppl. 1), 47–56. doi:10.4137/cmwh.s34668

European Centre for Disease Prevention and Control. (2020). Download data on country response measures to COVID-19. Retrieved from https://www.ecdc.europa.eu/en/publications-data/download-data-response-measures-covid-19

Ferrer, R.A., & Klein, W.M.P. (2015). Risk perceptions and health behavior. *Current opinion in psychology*, 5, 85–89. Elsevier. doi:10.1016/j.copsyc.2015.03.012

Q20

Hale, T., Angrist, N., Cameron-Blake, E., Hallas, L., Kira, B., Majumdar, S., ... Webster, S. (2020). Variation in government responses to COVID-19. Retrieved from https://www.bsg.ox.ac.uk/covidtracker

Helsper, E.J., & Reisdorf, B.C. (2017). The emergence of a "digital underclass" in Great Britain and Sweden: Changing reasons for digital exclusion. *New Media & Society, 19*(8), 1253–1270. doi:10.1177/1461444816634676

International Sport and Culture Association. (2020). Countries start lifting restrictions on exercise and sport under Covid-19 lockdowns: How do they compare? Retrieved from http://isca-web.org/english/news/countriesstartliftingrestrictionsonexerciseandsportundercovid19lockdownshowdotheycompare

Kim, Y.J., & Kang, S.W. (2021). Perceived crowding and risk perception according to leisure activity type during covid-19 using spatial proximity. *International Journal of Environmental Research and Public Health, 18*(2), 1–12. doi:10.3390/ijerph18020457

Lesser, I.A., & Nienhuis, C.P. (2020). The impact of COVID-19 on physical activity behavior and well-being of Canadians. *International Journal of Environmental Research and Public Health, 17*(11), 3899. doi:10.3390/ijerph17113899

Lindsay Smith, G., Banting, L., Eime, R., O'Sullivan, G., & van Uffelen, J.G.Z. (2017). The association between social support and physical activity in older adults: A systematic review. *International Journal of Behavioral Nutrition and Physical Activity, 14*(1), 56. doi:10.1186/s12966-017-0509-8

Lohiniva, A.-L., Sane, J., Sibenberg, K., Puumalainen, T., & Salminen, M. (2020). Understanding coronavirus disease (COVID-19) risk perceptions among the public to enhance risk communication efforts: A practical approach for outbreaks, Finland, February 2020. *Eurosurveillance, 25*(13), 2000317. doi:10.2807/1560-7917.ES.2020.25.13.2000317

Löllgen, H., Böckenhoff, A., & Knapp, G. (2009). Physical activity and all-cause mortality: An updated meta-analysis with different intensity categories. *International Journal of Sports Medicine, 30*(3), 213–224. PubMed ID: 19199202 doi:10.1055/s-0028-1128150

Narici, M., De Vito, G., Franchi, M., Paoli, A., Moro, T., Marcolin, G., ... Maganaris, C. (2020). Impact of sedentarism due to the COVID-19 home confinement on neuromuscular, cardiovascular and metabolic health: Physiological and pathophysiological implications and recommendations for physical and nutritional countermeasures. *European Journal of Sport Science,* 1–22. doi:10.1080/17461391.2020.1761076

Nowell, L.S., Norris, J.M., White, D.E., & Moules, N.J. (2017). Thematic analysis. *International Journal of Qualitative Methods, 16*(1). doi:10.1177/1609406917733847

OECD. (2020). *Women at the core of the fight against COVID-19 Crisis*. doi:10.1787/553A8269-EN

Office for National Statistics. (2011). 2011 Census. Retrieved from https://www.ons.gov.uk/census/2011census

Patterson, R., McNamara, E., Tainio, M., de Sá, T.H., Smith, A.D., Sharp, S.J., ... Wijndaele, K. (2018). Sedentary behaviour and risk of all-cause, cardiovascular and cancer mortality, and incident type 2 diabetes: A systematic review and dose response meta-analysis. *European Journal of Epidemiology, 33*(9), 811–829. PubMed ID: 29589226 doi:10.1007/s10654-018-0380-1

Pereira, M.A., Mullane, S.L., Toledo, M.J.L., Larouche, M.L., Rydell, S.A., Vuong, B., ... Buman, M.P. (2020). Efficacy of the "Stand and Move at Work" multicomponent workplace intervention to reduce sedentary time and improve cardiometabolic risk: A group randomized clinical trial. *International Journal of Behavioral Nutrition and Physical Activity, 17*(1), 133. doi:10.1186/s12966-020-01033-3

Pieh, C., Budimir, S., & Probst, T. (2020). The effect of age, gender, income, work, and physical activity on mental health during coronavirus disease (COVID-19) lockdown in Austria. *Journal of Psychosomatic Research, 136,* 110186. PubMed ID: 32682159 doi:10.1016/j.jpsychores.2020.110186

Prince, S.A., Reed, J.L., Martinello, N., Adamo, K.B., Fodor, J.G., Hiremath, S., ... Reid, R.D. (2016). Why are adult women physically active? A systematic review of prospective cohort studies to identify intrapersonal, social environmental and physical environmental determinants. *Obesity Reviews, 17*(10), 919–944. PubMed ID: 27465602 doi:10.1111/obr.12432

Qin, F., Song, Y., Nassis, G.P., Zhao, L., Dong, Y., Zhao, C., ... Zhao, J. (2020). Physical activity, screen time, and emotional well-being during the 2019 novel coronavirus outbreak in China. *International Journal of Environmental Research and Public Health, 17*(14), 1–16. doi:10.3390/ijerph17145170

Rogers, N.T., Waterlow, N.R., Brindle, H., Enria, L., Eggo, R.M., Lees, S., & Roberts, C.H. (2020). Behavioral change towards reduced intensity physical activity is disproportionately prevalent among adults with serious health issues or self-perception of high risk during the UK COVID-19 lockdown. *Frontiers in Public Health, 8,* 575091. PubMed ID: 33102424 doi:10.3389/fpubh.2020.575091

Ruiz-Roso, M.B., Knott-Torcal, C., Matilla-Escalante, D.C., Garcimartín, A., Sampedro-Nuñez, M.A., Dávalos, A., & Marazuela, M. (2020). COVID-19 lockdown and changes of the dietary pattern and physical activity habits in a cohort of patients with type 2 diabetes mellitus. *Nutrients, 12*(8), 1–16. doi:10.3390/nu12082327

Sallis, J., Owen, N., & Fisher, E.B. (2008). Ecological models of health behavior. In: K. Glanz, B. Rimer, & K. Viswanath (Eds.), *Health behavior and health education: Theory, research and practice* (Issue December 2015, pp. 465–482). Jossey-Bass.

Samitz, G., Egger, M., & Zwahlen, M. (2011). Domains of physical activity and all-cause mortality: Systematic review and dose-response meta-analysis of cohort studies. *International Journal of Epidemiology, 40*(5), 1382–1400. PubMed ID: 22039197 doi:10.1093/ije/dyr112

Sattelmair, J., Pertman, J., Ding, E.L., Kohl, H.W., Haskell, W., & Lee, I.M. (2011). Dose response between physical activity and risk of coronary heart disease: A meta-analysis. *Circulation, 124*(7), 789–795. PubMed ID: 21810663 doi:10.1161/CIRCULATIONAHA.110.010710

Sheeran, P., Harris, P.R., & Epton, T. (2014). Does heightening risk appraisals change people's intentions and behavior? A meta-analysis of experimental studies. *Psychological Bulletin, 140*(2), 511–543. PubMed ID: 23731175 doi:10.1037/a0033065

Slimani, M., Paravlic, A., Mbarek, F., Bragazzi, N.L., & Tod, D. (2020). The relationship between physical activity and quality of life during the confinement induced by COVID-19 outbreak: A pilot study in Tunisia. *Frontiers in Psychology, 11,* 1882. PubMed ID: 32849104 doi:10.3389/fpsyg.2020.01882

Smith, B., & McGannon, K.R. (2018). Developing rigor in qualitative research: Problems and opportunities within sport and exercise psychology. *International Review of Sport and Exercise Psychology, 11*(1), 101–121. doi:10.1080/1750984X.2017.1317357

Srivastav, A.K., Sharma, N., & Samuel, A.J. (2020). Impact of Coronavirus disease-19 (COVID-19) lockdown on physical activity and energy expenditure among physiotherapy professionals and students using web-based open E-survey sent through WhatsApp, Facebook and Instagram messengers: Impact of COVID-19 lockdown on physical activity and energy expenditure. *Clinical Epidemiology and Global Health, 9,* 78–84. doi:10.1016/j.cegh.2020.07.003

Triguero-Mas, M., Donaire-Gonzalez, D., Seto, E., Valentín, A., Martínez, D., Smith, G., ... Nieuwenhuijsen, M.J. (2017). Natural outdoor environments and mental health: Stress as a possible mechanism. *Environmental Research, 159,* 629–638. PubMed ID: 28938204 doi:10.1016/j.envres.2017.08.048

UK Government. (2020). Staying at home and away from others (social distancing).

Watson, C., Nieuwenhuijsen, M.J., Triguero-Mas, M., Cirach, M., Maas, J., Gidlow, C., ... Zijlema, W.L. (2020). The association between natural outdoor environments and common somatic symptoms. *Health and Place, 64,* 102381. PubMed ID: 32750670 doi:10.1016/j.healthplace.2020.102381

WomeninSport.org. (2020). Lockdown research—Implications for women's participation. Retrieved from https://www.womeninsport.org/research-and-advice/our-publications/lockdown/

Zijlema, W.L., Triguero-Mas, M., Smith, G., Cirach, M., Martinez, D., Dadvand, P., ... Julvez, J. (2017). The relationship between natural outdoor environments and cognitive functioning and its mediators. *Environmental Research, 155,* 268–275. PubMed ID: 28254708 doi:10.1016/j.envres.2017.02.017

Queries

Q1. Please confirm the edit made to the article title.

Q2. Please note that "Abstract" is added from metadata. Please confirm they are correct.

Q3. Please provide 3–5 keywords. And please ensure that repetition of words in journal and article title are not allowed.

Q4. Please check whether the changes to the sentence beginning “Such measures . . .” preserve the intended meaning.

Q5. There is a mismatch between title page and meta-data in the author name "Jacky J. Forsyth." Please check and do the needful.

Q6. Please ensure author information is listed correctly here and within the byline.

Q7. Please confirm the use of “caring” is as meant and meaning clear to reader.

Q8. Please confirm the use of “care” is clear to reader.

Q9. Please check the word “cater is as meant here”.

Q10. Please provide the name of the institution in the sentence "This study was approved . . . ."

Q11. Please check if "could reopen" can be changed to "reopened on" in the sentence "Outdoor pools were . . . ."

Q12. Please check the sentence “In the initial survey, participants had the opportunity . . . ” for clarity.

Q13. Please provide manufacturer name and location details (city, state [if USA], and country) for “NVivo 12 Pro.”

Q14. Please check “referred” is as meant in sentence beginning “Physical restriction . . . .”

Q15. Please confirm change of verb tense to “were” preserves the intended meaning of sentence beginning “Two subthemes . . . .”

Q16. Please check edit to “responsibility” preserves the intended meaning of sentence. Please check if this change can be done globally.

Q17. Please check the edit inserting “their” is ok for readability/clarity in the sentence "In contrast, for some . . . ."

Q18. Please check the sentence "As well as leisure-time . . ." for clarity.

Q19. Please check changes to sentence "However, in the current study . . ." preserves the intended meaning.

Q20. Please provide publisher location for Creswell (2013).

Q21. Please update volume number for Narici et al. (2020).

Q22. Please provide page number for Nowell et al. (2017).

Q23. Please provide publisher name and location for OECD (2020).

Q24. Please provide publisher location for Sallis et al. (2008).

Q25. Please provide hyperlink for the UK Government (2020).