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An Australian exploratory study of individual physical functioning and wellbeing of rural clients with chronic diseases whose structured exercise groups were cancelled due to social distancing requirements of the COVID-19 pandemic

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ABSTRACT

Background. The primary aim of this study was to describe if there was a change in physical functioning of rural clients with chronic diseases who were unable to attend their structured exercise groups during the COVID-19 pandemic. The secondary aim was to describe their physical activity during lockdown and their wellbeing upon return to their structured exercise groups. **Method.** Physical functioning measures collected in January to March 2020 (prior to suspension of structured exercise groups due to the lockdown) were repeated in July 2020 (when face-to-face activity resumed) and compared. A survey collected information about the client's level of physical activity during lockdown and wellbeing measures at the end of the lockdown. **Results.** Forty-seven clients consented to provide physical functioning tests and 52 completed the survey. Only the modified 2-min step-up test displayed a statistically (but not clinically) significant change ($n = 29$, 51.7 vs 54.1 rep, $P = 0.01$). Physical activity undertaken during lockdown was less in 48% ($n = 24$), the same in 44% ($n = 22$) and increased in 8% ($n = 4$) of clients. Despite the lockdown, clients had high global satisfaction, high subjective wellbeing and normal resilience. **Conclusions.** Clinically significant changes in physical functioning when clients were unable to attend structured exercise groups for three months during the COVID-19 pandemic were not observed in this exploratory study. Further research is required to confirm the impact of isolation on physical functioning in those participating in group exercise to improve their chronic disease management.

Keywords: chronic disease, COVID-19, exercise therapy, isolation, physical activity, physical functioning, rural, wellbeing.

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Introduction

Group exercise is used to help those with chronic disease improve or maintain their overall quality of life, whether that be through improving aspects of physical functioning, mental health or social connectedness. Warner and colleagues demonstrated that group exercise aids in the improvement of self-efficacy, social competency and cognitive stability in the older adult population, whilst also reducing age-related health concerns (Warner *et al.* 2014). Additionally, group exercise has been shown to be beneficial for the management of chronic diseases through cardiac and pulmonary rehabilitation (Verrill *et al.* 2005; Anderson *et al.* 2017), falls prevention (Albert and King 2017), as well as in oncology (Mutrie *et al.* 2007) and neurodegenerative diseases (Tarakci *et al.* 2013). There is evidence that a decrease in activity or exercise can have negative consequences on overall health and disease progression, for example, in people with Parkinson's disease (Song *et al.* 2020).

Suspension of all face-to-face group exercise activities provided by East Grampians Health Service occurred in March 2020 because of the COVID-19 pandemic. This response was unprecedented and all Australian health services were forced to review their operations and make changes to the way services were delivered to align with mandatory health

directives. At the time, the organisation did not have the required experience or infrastructure to develop and implement a virtual delivery model in a short time frame. There was real concern expressed by frontline clinicians that their clients may exhibit poorer physical outcomes as a result of their inability to attend structured exercise groups, as well as negatively impacting their wellbeing. The impact of sudden and unplanned breaks from such structured exercise groups on physical functioning and wellbeing had yet to be explored in the literature in the context of the strict isolation requirements of the COVID-19 pandemic. There is a need to better understand the impact of structured exercise group suspension during such strict isolation on physical functioning and wellbeing, to inform future planning and practice, and support high quality care of clients living with chronic disease.

Therefore, this real-world study was designed to explore the change in physical functioning of rural clients with chronic diseases who were unable to attend their structured exercise groups during the strict isolation imposed during the COVID-19 pandemic (primary outcome). In addition, it sought to describe any change in physical activity during the lockdown and the wellbeing of clients upon their return to the structured exercise groups (secondary outcomes).

Methods

Program of interest

East Grampians Health Service is a medium sized rural health service in Ararat and Willaura. The Ararat Local Government Area (LGA) has a high proportion of residents born in Australia (82%), according to the last census, and residents report a higher proportion of chronic disease than the Australian population (Australian Bureau of Statistics 2021). East Grampians Health Service provides structured group exercise as a component of the Chronic Conditions Model of Care program for people living with chronic and complex conditions (Western Victoria Primary Health Network 2021). Clients attend face-to-face exercise activities and coaching by either an exercise physiologist, physiotherapist or an exercise-trained allied health assistant (exercise lead). The group exercise classes are formed by chronic condition-based grouping where numbers permit (e.g. oncology, pulmonary), as well as location (e.g. satellite sites with mixed chronic conditions). The service is provided to approximately 70 clients at any one time.

Prior to lockdown, structured exercise groups were held on a weekly basis except for one group that was held twice weekly. Exercise groups were delivered in one of two ways, circuit based (four out of six groups) or through supervised individually tailored programs (two out of six groups). Circuit based programs were designed by the exercise lead, prior to the exercise class, according to the chronic condition being treated, and could include a wide range of land-based exercise modes such as body weight exercise, resistance (dumbbell, resistance band, machines), aerobic (treadmill, bike, arm ergo, walk), gait training (steps, hurdles), balance specific (dynamic/static, unstable/stable), Pilates or tai chi. Individually tailored exercise programs were co-designed by the client and the exercise lead to target individual and condition specific goals. Exercise could include any of the previously mentioned modes. Exercise typically involved a warm-up, strength and aerobic exercises, balance-specific exercise and a cool-down. Each exercise class ran for approximately 1 h in duration. An exercise lead was always present in classes to ensure clients were being challenged according to their capacity for exercise and functioning.

During lockdown, all face-to-face exercise groups were suspended, and clients were offered limited phone-based support (fortnightly phone calls by the exercise lead) and were supplied with a home exercise program based on their individual functioning level. Two differing home exercise programs were developed. These varied in safety precautions depending on clients' falls risk and consisted of three lower limb and three upper limb exercises. The first program (high safety precaution) consisted of seat-based exercises (e.g. shoulder lateral raise, hip external rotation) using a resistance band, and hand supported bodyweight exercises (e.g. sit to stand). The second program (low–moderate safety precaution) consisted predominately of bodyweight exercise (e.g. squats, lunges) with support if needed, and seated/standing resistance band exercises (e.g. shoulder lateral raise, bicep curl). Resistance band level was according to the client's use in class. All exercises in the programs were familiar to clients having been completed prior to lockdown. Clients were advised to undertake their home exercise program three to four times per week if able, as well as encouraged to meet the recommended walking guidelines of at least 30 min per day.

Participants

The inclusion criteria for the study were clients who were attending any of the six structured exercise groups delivered by East Grampians Health Service at the time face-to-face activities were suspended due to the COVID-19 pandemic and who had at least one physical functioning test (Table 1) completed between January and March 2020 (n = 69). Exclusion criteria were clients who were unable to provide informed consent due to cognitive impairment, intellectual disability or poor English comprehension.

All clients who met the inclusion criteria were contacted by phone by their exercise lead (or delegate) once and the study explained. Non responders were not followed up. If the client expressed an interest, a Participant Information and Consent Form was posted to the client by the exercise lead (or delegate). The Participant Information and Consent Form sought consent to access data on physical functioning tests already collected as a part of routine care (January to March 2020) and to re-collect physical functioning test data and administer a survey upon return to the exercise group.

Table 1. Physical functioning tests.

Physical functioning tests	Purpose of test
Comprehensive balance test (adapted from both the Clinical Test of Sensory Interaction for Balance (CTSIB) as well as the Balance Error Scoring System (BESS) test) (Cohen *et al.* 1993; Bell *et al.* 2011)	Measure of postural control and static balance whilst manipulating stable and unstable surfaces and with and without vision deficit
30-s bicep curl test (females 2 kg, males 3 kg) (Marlow *et al.* 2014)	Measure of upper body strength and endurance
30-s sit to stand test (Marlow *et al.* 2014)	Measure of lower body strength and endurance
Modified 2-min step-up test[A]	Measure of lower body endurance and cardiorespiratory fitness
Timed up and go (Marlow *et al.* 2014)	Measure to determine overall falls risk and assessment of dynamic balance, lower body strength and walking
6-min walk test (Marlow *et al.* 2014)	A sub-maximal exercise test used to assess aerobic capacity and endurance
10-metre walk test (Marlow *et al.* 2014)	A measure to assess walking speed, as well as determine functional mobility, gait and vestibular function
Grip strength (Marlow *et al.* 2014)	Measure of muscular strength or the maximum force

[A]Clients complete a full step-up (both feet up and down) for 2 min, using a portable step. Clients are instructed to complete the first minute using the same side foot and advised to swap feet at the 1-min mark. Tiers were added depending on each individual's capabilities. The same height step was used for baseline and return to exercise testing.

The client returned the completed consent form when face-to-face activity resumed. Participants were free to withdraw from the study at any time.

Data sources – primary outcome

The length of participation in the structured exercise group prior to lockdown was obtained from the Patient Administration System by study investigator JR. The most recent physical health measures collected prior to the suspension of structured exercise groups (date range January to March 2020) were extracted from medical records for participating clients (forming the baseline measurement) by study investigator JR. The physical health measures were repeated in July 2020 when face-to-face activity resumed for the first time. Physical functioning tests (Table 1) were completed by either an exercise physiologist, physiotherapist or trained allied health assistant in the same setting as collected previously. The tests routinely completed depended on the exercise group attended.

Data sources – secondary outcomes

A 15-min paper survey was utilised to collect information about the client's experiences during the break from structured exercise groups. A copy of the survey is available as Supplementary material (S1). It was comprised of:

- Demographic questions on relationship status and the household, using wording from the Australian Unity Wellbeing Index survey (Capic *et al.* 2018). Questions about exposure to COVID-19 during the lockdown were also included.
- Questions on physical activity during the COVID-19 isolation: this captured the types of physical activity undertaken, the amount of exercise undertaken, use of their Home Exercise Plan and engagement with health professionals about their physical health (Lee *et al.* 2011).
- Self-assessed health: this single question measured self-rated health. In accordance with the Australian Institute of Health and Welfare (AIHW) surveys, the responses were excellent, very good, good, fair and poor (Australian Institute of Health and Welfare 2018).
- Personal Wellness Index (PWI). The PWI is a multi-scale tool that measures satisfaction on a scale of 0–100 points across seven life domains (standard of living, health, achieving in life, relationships, safety, community connectedness and future security) (International Wellbeing Group 2013). Respondents indicate how satisfied they feel on a scale from 0 to 10, where 0 means they feel no satisfaction at all and 10 means completely satisfied. Also included was a single item for Subjective Wellbeing (SWB) known as the Global Life Satisfaction (GLS) measure (International Wellbeing Group 2013).
- Brief Resilience Scale (BRS): this is a 6-item validated survey that assesses the ability of a person to bounce back or recover from stress.(Smith *et al.* 2008).

The survey was not piloted before use because it was composed of validated survey tools. The survey was administered at the first face-to-face exercise group attended (where possible) by study investigator JR. Those who did not return to the exercise groups were able to complete the survey and return it by post. This alternative method of survey return was offered to facilitate a more complete dataset.

Data synthesis and analysis

For a client's data to be included in the analysis of each separate physical functioning test, the client needed a baseline test result between January and March 2020 (pre-COVID-19) and a test result upon returning to the exercise groups (June to July 2020). Eligible data for each physical

functioning test was combined to form the baseline and return data sets.

This study utilised a pragmatic and exploratory sample size. Data were included in the analysis when there were ten or more paired observations to include in the analysis.

Mean, standard deviation and confidence intervals were calculated for each physical functioning test, and a paired *t*-test performed ($\alpha = 0.05$) by study investigator JR. The results were also reviewed for clinical significance. Clinical significance was defined using published parameters for clients with chronic diseases where possible. However, where there was no published parameter for clients with chronic diseases, clinically significant change was reached via consensus by three exercise physiologists.

For the survey data, summary statistics were calculated for each measure by study investigator JB. The PWI and BRS scores were calculated only for those participants who responded to all questions in that set in accordance with the survey instructions (International Wellbeing Group 2013). All other responses were included if the participant chose to answer.

Ethics approval

This work was conducted in accordance with the NHMRC National Statement on Ethical Conduct in Human Research (The National Health and Medical Research Council, The Australian Research Council, Universities Australia 2007) and the Australian Code for the Responsible Conduct of Research, 2018 (The National Health and Medical Research Council, The Australian Research Council, Universities Australia 2018). This study received ethical approval from the Ballarat Health Services and St John of God Human Research Ethics Committee (LNR/63936/BHSSJOG-2020-213619). The research was undertaken with appropriate informed consent of participants or guardians.

Results

Overall, 52 clients agreed to participate in the study (52/69, 75.3%). Of these, 47 clients consented to provide physical functioning tests and complete the survey. The remaining five clients consented to undertake the survey only.

Of the 52 clients, 45 (87%) had been attending exercise classes for more than three months prior to their cancellation.

Table 2 shows the number of clients who had eligible data for each physical functioning test at both time points, and mean baseline and return values for each physical functioning test. No results demonstrated a clinically significant difference. Only the modified 2-min step-up test had a statistically significant change ($n = 29$, 51.7 vs 54.1 repetitions, 95% CI 0.5 to 4.4, $P = 0.01$), with the return group performing better on this test.

Of those that answered the question about the amount of physical activity undertaken during lockdown, 24 clients (48%) reported less physical activity than usual, 22 clients (44%) the same and four clients (8%) more physical activity than usual during lockdown (Table 3).

Those that lived alone were less likely to report reduced physical activity (25%, 6/24) compared to those who lived with others (75%, 18/24) ($P = 0.03$). Most (61.2%) did not seek advice on their physical health from a health professional while exercise groups were suspended. Exercises to increase muscle strength and endurance, such as those included in their home exercise program, were not completed by 24.0% of clients.

Overall, the clients reported high personal wellbeing (SWB: mean 80.0, range 16–97) and high GLS (mean 8.0, range 2–10) despite the recent COVID-19 lockdown (Table 3). Many clients (70.2%) fell within the normal range for resilience. Despite chronic illness, only 15.7% of clients rated their health as fair, and none reported it as poor.

Discussion

This exploratory study sought to investigate whether the physical functioning of clients with chronic conditions was impacted as a result of suspending face-to-face structured exercise groups during the COVID-19 pandemic. Our data suggested that physical functioning was not impacted to a

Table 2. Physical functioning test results.

Test	*n*	Baseline mean (s.d.)	Return mean (s.d.)	Difference baseline to return (direction of performance change[A])	*P*-value	95% CI	Clinically significant (±)
Comprehensive balance test – stable surface	33	129 (35.1)	128.2 (39.4)	0.8 (↓)	0.71	−8.1 to 5.6	10
Comprehensive balance test – unstable surface	28	102.5 (35.3)	98.7 (34.4)	3.8 (↓)	0.34	−11.8 to 4.2	10
30-s bicep curl test – right hand	30	18.9 (5.2)	18.5 (5.9)	0.4 (↓)	0.55	−1.6 to 0.9	4
30-s bicep curl test –left hand	29	19.2 (5.0)	19.0 (5.3)	0.2 (↓)	0.78	−1.4 to 1.1	4
30-s sit to stand test	39	12.4 (4.7)	12.4 (3.9)	0 (–)	0.87	−0.9 to 1.0	2[B]
Modified 2-min step-up test	29	51.7 (17.3)	54.1 (17.7)	2.4 (↑)	0.01	0.5 to 4.4	10

[A]↑, improvement; ↓, decline.
[B]Wright *et al.* (2011).

Table 3. Survey demographics and responses.

Question/response options	Responses
Demographics	
Gender ($n = 52$)	
Male	9 (17.3%)
Female	43 (82.7%)
Other/prefer not to say	0
Age ($n = 52$)	
Average (range)	71.1 (35–92)
Current relationship status ($n = 52$)	
Never married	2 (3.8%)
Defacto/living together	1 (1.9%)
Married	32 (61.5%)
Separated	4 (7.7%)
Divorced	2 (3.8%)
Widowed	11 (21.2%)
Current living arrangements (multiple responses possible, % not calculated)	
No one – you live by yourself	17
You live with your partner	34
With one or more children	2
With one/both of parents	0
With one or more adults who are not your partner/ parent	0
COVID-19 exposure	
Were you ever tested for COVID-19 because you had symptoms? ($n = 51$)	
Yes	2 (3.9%)
No	49 (96.1%)
Did you come in contact with someone who had COVID-19? ($n = 51$)	
Yes	0
Not to my knowledge	51 (100.0%)
Physical activity during lockdown	
How would you describe the amount of physical activity you completed? ($n = 50$)	
Less physical activity	24 (48.0%)
More physical activity	4 (8.0%)
Same amount	22 (44.0%)
Reporting less physical activity completed during lockdown	
Lives alone	6/24 (25%)
Lives with others	18/24 (75%)
How often did you usually walk outside your home or yard for any reason? ($n = 51$)	
Never	5 (9.9%)
1–2 days per week	11 (21.5%)
3–4 days per week	11 (21.5%)
5–7 days per week	24 (47.1%)
How often did you usually undertake light recreational activities? ($n = 48$)	
Never	2 (4.2%)
1–2 days per week	11 (22.9%)
3–4 days per week	15 (31.3%)
5–7 days per week	20 (41.6%)
How often did you usually undertake moderate recreational activities? ($n = 48$)	
Never	18 (37.5%)
1–2 days per week	14 (29.1%)
3–4 days per week	13 (27.1%)
5–7 days per week	3 (6.3%)
How often did you usually undertake strenuous recreational activities? ($n = 49$)	
Never	42 (85.7%)
1–2 days per week	5 (10.2%)
3–4 days per week	2 (4.1%)
5–7 days per week	0
How often did you usually undertake exercises specifically to increase muscle strength and endurance, such as completing your home exercise program? ($n = 50$)	
Never	12 (24.0%)
1–2 days per week	21 (42.0%)
3–4 days per week	8 (16.0%)
5–7 days per week	9 (18.0%)
Input into physical health	
How often did you speak with your exercise group leader? ($n = 51$)	
At least once every 2 weeks	14 (27.5%)
Less often than once every 2 weeks	25 (49.0%)
Never: I did not speak with the exercise group leader at all	12 (23.5%)
Did you seek advice on your physical health from anyone other than your exercise group leader? ($n = 49$)	
No: I did not seek advice on my physical health	30 (61.2%)
Yes: I sought advice from a health professional	19 (38.8%)
Yes: I sought advice from a non-health professional	0
Self-rated health	
In general, how would you rate your current health status? ($n = 51$)	
Excellent	2 (3.9%)
Very Good	21 (41.2%)
Good	20 (39.2%)
Fair	8 (15.7%)
Poor	0
Wellbeing and resilience	

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Table 3. (*Continued*).

Question/response options	Responses
Thinking about your own life and personal circumstances, how satisfied are you with your life as a whole? ($n = 51$)	
Average (range)	8.0 (2–10)
Score 6 or less	10 (19.6%)
Personal wellbeing index ($n = 48$)	
Average (range)	80.0 (16–97)
Resilience score ($n = 47$)	
Average (range)	3.37 (1.5–5.0)
Resilience category ($n = 47$)	
High	4 (8.5%)
Normal	33 (70.2%)
Low	10 (21.3%)

clinically significant degree by COVID-19 imposed isolation. This was unanticipated based on previous literature in the non-COVID-19 setting (Song *et al.* 2020). The findings also suggest that almost half of rural clients with chronic diseases who were unable to attend their structured exercise groups during the COVID-19 pandemic reduced their amount of physical activity during lockdown. Positively, despite the COVID-19 pandemic, clients reported high global satisfaction, high subjective wellbeing and good resilience upon their return to face-to-face structured exercise groups.

This study contributes to the literature in several ways. Firstly, it was undertaken in an Australian rural community. Despite there being more than 6.5 million Australians (28.7% of the population) residing outside metropolitan areas (Australian Bureau of Statistics 2021), there is a relative lack of rural health research. This results in comparatively less evidence applicable to the rural context (Barclay *et al.* 2018; Moran *et al.* 2019). Sharing of the findings of this study contributes to the vital evidence needed to understand the impacts of the COVID-19 pandemic on care delivery in the rural context.

Secondly, this study focused on the physical functioning and wellbeing of those who were involved in an exercise program to support chronic disease management. There are many examples in the COVID-19 literature of studies that explored the impact of lockdowns on the general population (e.g. Yamada *et al.* 2020; Eek *et al.* 2021; McCarthy *et al.* 2021), those with chronic disease (but not enrolled in a supervised exercise program) (e.g. Cunha *et al.* 2021; Fallon *et al.* 2021; López-Sánchez *et al.* 2021; Moumdjian *et al.* 2022) and those enrolled in a supervised exercise program but without chronic disease (Markotegi *et al.* 2021). A recent systematic review concluded that the 'COVID-19 pandemic and subsequent quarantines reduced physical activity among all age groups and both sexes and had detrimental effects on people's physical and mental health' (Mehraeen *et al.* 2023). However, there remains limited literature about the impact on physical functioning and wellbeing from the cancellation of structured exercise programs in those with chronic disease. A small US study of patients with Parkinson's disease attending physical intervention classes found a reduction in active minutes per day during the stay-at-home mandate and worsening self-reported symptoms of Parkinson's disease (Templeton *et al.* 2021). Another study explored the impact of fitness and dance training, followed by 4 weeks of no training (COVID-19-induced), on cardiac adaptations and physical performance indicators in older adults with mild cognitive impairment. The authors suggested that to maintain the health benefits seen during the fitness and dance training, the training has to be continued and with any periods without training minimised (Ammar *et al.* 2021). Although both studies were small, they added credibility to local health professionals' concerns that an absence from a structured exercise program could have a negative impact on those with chronic disease. Conversely, another study found that the benefits of a tailored training program in sarcopenic older adults living in a nursing home persisted after 14 weeks of inactivity due to COVID-19 confinement (Courel-Ibáñez *et al.* 2021). This aligned with our findings that physical functioning was not impacted by the suspension of face-to-face structured exercise groups during the COVID-19 pandemic. The differences in study outcomes highlights the need for further research.

Thirdly, this study collected valuable information about GLS and SWB from clients when they returned to group exercise after the first COVID-19 lockdown. Clients reported an average SWB of 80.0 and only 19.2% reported a GLS of less than six (low–medium life satisfaction), indicating an overall high level of wellbeing. This was in contrast to the findings of the VicHealth Coronavirus Victorian Wellbeing Impact Study Survey #1 during a similar time period, which reported a SWB score of just 65 and 49% of respondents with low–medium life satisfaction during lockdown (Victorian Health Promotion Foundation 2020). Our clients also rated higher on SWB compared to the Australian average of 75.4 points (normative range between 74.2 and 76.8 points) (Capic *et al.* 2018). The VicHealth Coronavirus Victorian Wellbeing Impact Study #1 identified some characteristics that predicted a more positive response in both the SWB and GLS, potentially providing insights into our findings. These were being over 65 years of age, living outside a capital city, being retired and couples living alone (Victorian Health Promotion Foundation 2020). Our sample was predominately aged over 65 years, living alone or with a partner and from a rural area. In addition, 70.2% of participants in the current study were considered to have 'normal' resilience indicating an ability to recover from life events (Smith *et al.* 2008). We suggest that protective factors (such as living outside of a metropolitan centre), low case numbers of COVID-19 in the community and

'normal' resilience helped wellbeing and life satisfaction in the local community.

With the rapid shift to virtual modalities during the COVID-19 pandemic (Jennings *et al.* 2020; Middleton *et al.* 2020; Vincenzo *et al.* 2021), there was the opportunity for the continuation of exercise groups in that modality. However, some evidence suggests that virtual classes alone may not fully fill the void. Another US study of people with Parkinson's disease attending face-to-face exercise groups prior to the COVID-19 pandemic reported an overall decrease in exercise frequency and intensity despite participation in virtual classes (Mañago *et al.* 2021). The top barriers for virtual participation included lack of socialisation, lack of accountability to attend and technology problems. In addition, the participants indicated they still required help to stay motivated and access to a place to exercise safely (Mañago *et al.* 2021). A recent systematic review found that home exercise programs were inferior to structured exercise programs in people with intermittent claudication, unless monitoring was included (Pymer *et al.* 2021). A cross-sectional study of individuals with prediabetes/diabetes who had completed an exercise intervention which started on-site and moved to a remote home-based regime due to the COVID-19 pandemic, found that only 53.8% adhered to the recommended exercise at home (Ponciano *et al.* 2022). Our findings highlighted that many clients did not actively complete their home exercise program during lockdown, nor did they recall engaging with their exercise group leader via phone. However, other studies have found that virtually delivered programs are at least equivalent to face-to-face offerings (Jarvis *et al.* 2022; Palmer *et al.* 2022). This suggests that more research is also required on what facilitates client motivation and engagement in physical activity during periods of isolation.

The small sample size limits the ability of this study to draw firm conclusions on the impact of lockdowns on physical functioning in those clients with chronic conditions who were unable to attend face-to-face structured exercise groups during the COVID-19 pandemic. The challenges in achieving adequate numbers for statistical power are inherent in conducting research in rural settings with limited populations. Measures such as SWB and GLS taken immediately prior to lockdown would have provided better baseline data rather than population comparisons, however, this was not possible due to the sudden onset of the pandemic and related restrictions. Similarly, detailed information on the client's intensity of physical activity prior to lockdown was not able to be collected retrospectively. Confounders that may have influenced physical functioning (e.g. disease severity, medical treatments) were not collected. While the physical functioning tests utilised were well established and considered valid and reliable to assess physical functioning in clinical practice, their use has some limitations when not used in a controlled research environment. There is the potential for variable patient effort and instructor differences, which may explain some of the variability in the results.

Physical activity, such as that offered in group exercise programs, remains an important part of maintaining and improving health and wellbeing in those with chronic conditions. Prolonged periods of mandated isolation due to COVID-19 (or other infectious diseases) or periods of isolation that result from natural disasters (e.g. bushfires, earthquakes, hurricanes, floods) may occur again in the future, disrupting the way that healthcare is delivered. Large, well-designed studies are still required to better understand the impact of isolation on physical functioning in those participating in group exercise to improve their chronic disease management (Roschel *et al.* 2020; Templeton *et al.* 2021), as well as the factors that may encourage maintenance of physical activity in such circumstances. Rural health services must be supported to join these studies so that the rural experience is captured.

Supplementary material

Supplementary material is available online.

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