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Original research

Australian golfers with and without osteoarthritis report reduced psychological distress and improved general health compared to a general population-based sample

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A B S T R A C T

Objectives: To (i) evaluate psychological distress and general health in Australian golfers and compare with a general population-based sample, and (ii) explore the relationship between playing golf, psychological distress and general health in individuals with osteoarthritis.
Design: Cross sectional.
Methods: A cross-sectional survey collected outcomes in 459 Australian Golfers (Kessler-10 Psychological Distress Scale, Short-Form 12 (Health Status), International Physical Activity Questionnaire, osteoarthritis status). Outcomes were compared between Australian golfers and a general population-based sample (Australian Health Survey, n = 16,370).
Modified Poisson regression estimated the relationship between playing golf and general health in all participants and a subgroup with osteoarthritis (n = 128 golfers, n = 2216 general population). All analyses were adjusted for age, sex, education and smoking status.
Results: Playing golf was associated with lower psychological distress (adjusted mean difference (95 % confidence interval) −2.5 (−4.1 to −0.9)) and a greater likelihood of reporting good to excellent general health (adjusted relative risk (95 % confidence interval) 1.09 (1.05 to 1.13)) compared to the general population. Amongst people with osteoarthritis, playing golf was associated with lower psychological distress (adjusted mean difference −4.0 (95 % confidence interval −6.5 to −1.5)) and a greater likelihood of reporting good to excellent general health (adjusted relative risk (95 % confidence interval) 1.3 (1.2 to 1.4)).
Conclusions: Golfers had lower levels of psychological distress and better general health than the general population, and this relationship was strongest in individuals with osteoarthritis.

Practical implications

- Golfers on average reported a low level of distress, whilst the general population reported moderate levels of distress.
- Golfers with OA were more active, reported lower levels of psychological distress and better general health than a sample of the general population with OA.
- 91 % of golfers with OA rated their general health as good, very good or excellent, compared to 64 % of the general population.
- Golf participation may be associated with psychological and general health benefits for adults with OA.

1. Introduction

Golf is a popular sport with a global reach, played by approximately 60 million people in 200 countries and territories around the world.[1] In older adults, participation in golf is influenced by a range of factors, including health, social connectedness, fun and sense of community,[2,3]

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consistent with known motivators[4] and benefits of playing sport in older age.[5] Playing golf is associated with cardiovascular, respiratory, and metabolic health benefits.[6] Golf participation also provides an opportunity for older adults to maintain physical activity and cognition,[7] social activity and maintain relationships,[2,3] which could have positive impacts on mental health. This is particularly important for older adults, who may experience poor mental health, increased levels of psychological distress and reduced overall wellbeing as a result of changes to life roles and responsibilities.[8] Healthy ageing is broadly defined as 'the process of developing and maintaining functional ability that enables wellbeing'.[9] The combination of a person's physical and mental capacities is now viewed as key determinants of health and wellbeing, rather than disease state.[10] Additionally, anxiety, depression and distress can have a greater impact on an individual's perceived health and wellbeing than the loss of physical abilities, and evidence suggests physical activity plays an important role in supporting mental health in older adults.[5] However, studies that specifically explore the relationship between golf participation and mental health provide conflicting evidence.[11] An International Consensus Statement on Golf and Health published in 2018[12] recommended that more research should be undertaken to better understand the relationship between golf and mental health.

In addition, golf participation could reduce the burden associated with certain chronic conditions.[13] Osteoarthritis (OA) is a chronic condition with a significant personal and public health burden. Over 2 million (~1 in 12) Australians live with OA, costing an estimated $2.1b to the health system in 2015, and this cost is expected to rise to $3b by 2030.[14] Arthritis accounts for 8 % of the total burden of disease, with OA being the most common form, and is the leading cause of chronic pain and the second most common cause of disability.[14] People with OA report impaired mental health and general health.[15] The risk of developing OA increases with age, such that older adults are more likely to both develop OA and feel the effects of the disease.[16] To counteract the negative impact of OA on quality of life and function, physical activity participation is recommended. Golf is a popular, accessible form of physical activity for older adults. However, a small exploratory study found increased joint inflammation in golf participants with OA, and increased pain for those who walk whilst playing compared to when using a cart.[17] Further research is needed to determine the association between playing golf and mental and general health, in people with OA.

The objectives of this study are to (1) evaluate psychological distress and general health in Australian golf participants compared with a general population-based sample, and (2) explore the relationship between playing golf, psychological distress and general health in a sub-group of individuals with OA.

2. Methods

A quantitative survey method was used in this study, which occurred in two stages. Initially, to obtain specific data from a sample of the golfing population within Australia a purpose-built online survey was developed. The survey was adapted from the Cricket Health and Wellbeing Survey[18] to include questions related to golf participation. The survey was piloted by members of independent research groups and 12 golfers, who provided feedback on question content, structure, relevance, understandability, and participant burden. The survey was then designed in REDCap[19] hosted by the University of South Australia, allowing for safe and secure collection and storage of data. This study was approved by the University of South Australia Human Research Ethics Committee (Approval 201547).

Study information and a link to the consent form and survey were distributed to potential participants by Golf Australia via social media and an electronic newsletter. There are approximately 450,000 registered golfers within the Golf Australia database. However, due to the nature of recruitment the exact number of golfers who viewed and responded to the study invitation on social media or electronic newsletter is unknown. Inclusive eligibility criteria were employed to attract a diverse, representative sample of Australian golfers. Participants were required to be current golfers (i.e., playing no less than once per month), however there were no limitations on the frequency of play or duration of involvement in golf, nor was there restriction on age, gender, playing ability, health issues, ethnicity, race, demographic location or socio-economic status.

During the first stage, The Australian Golf and Health Survey (AGHS) was developed and used to collect new data related to golf participation and measures of health and wellbeing during 2018–2019. The AGHS survey collected demographic data, golf participation such as years played, frequency of playing and level of ability, self-reported measures of medical diagnosis (condition level), HRQoL (Short-Form Health Survey (SF12)),[20] psychological distress (Kessler Psychological Distress Scale (K10))[21,22] and physical activity levels (International Physical Activity Questionnaire (IPAQ)) in current golfers.

The AGHS utilised a range of valid and reliable outcome measures. Physical activity levels were reported using the IPAQ. This self-reported measure of physical activity has acceptable levels of concurrent validity, criterion validity and test–retest reliability, suggesting IPAQ is an appropriate tool to gather physical activity data at population levels.[23] For the current study, one item (SF12 Q1: 'In general, would you say your health is: Excellent/Very Good/Good/Fair/Poor') was used to investigate self-reported general health, to allow for comparison against the general population data within the Australian Health Survey. The Kessler 10 (K10) scale measures level of psychological distress, with a lower score indicating a lower level of psychological distress. The K10 scale has been shown to be a valid measure of both anxiety and mood, as well as an overall measure of psychological distress.[21,24] Scores are interpreted based on adaptations of Andrews and Slade[22], whereby a score of 10–15 represents a low level of psychological distress, 16–21 a moderate level, 22–29 a high level and 30–50 a very high level of psychological distress. *Smoking status* was categorised as 'never, former and current', and *highest level of education* was categorised as 'did not complete high school, high school, diploma, university degree, and not reported'.

The second stage of data collection involved accessing a subset of the Australian Health Survey (AHS).[25] The AHS is a large dataset containing data related to demographics, nutrition, diet, medical conditions, physical activity and socio-economic indicators.[25]Conducted every 4 years, the survey provides population level data of the Australian population and was accessed via the Australian Bureau of Statistics (ABS).[25] Data is accessed via the secure DataLab facility provided by the ABS, following training and clearance of approved researchers (BS and TB). Data from the AHS was used as a general population comparator group.

Participant data relevant to the current study was identified in the AHS database and saved within a new secure folder within the DataLab. The two data sets (AGHS and AHS) were further screened for consistency between variables of interest, and where necessary, variables were-recoded to ensure consistency between the two datasets. For example, medical condition data regarding OA within the AHS was coded in up to 5 different ways (related to if the medical condition is current and who made the diagnosis), whilst the data within the AGHS was coded only 2 ways (has or has not got the medical condition). The medical condition data (OA) in the AHS was dichotomised into has or has not got the medical condition. Similarly, physical activity data within the AHS was presented in hours and minutes, whereas physical activity data within AGHS was presented in minutes only. Once recoded, the two datasets were merged, so that the final dataset consisted of a sample of both golfing and general populations. Participants with missing data for the outcome variables or any covariates were excluded from the analysis, leaving a total of 16,755 participants (385 AGHS, 16,370 AHS) in the psychological distress analysis and 16,774 participants (404 AGHS, 16,370 AHS) in the health status analysis.

The independent variables consisted of (1) golfers vs general population, and (2) golfers with osteoarthritis vs general population with osteoarthritis. Dependent variables were physical activity levels (IPAQ),

Table 1
Demographic data stratified by golf participation and osteoarthritis status.

Variable	Golfers n = 385	General population n = 16,370	Golfers with osteoarthritis n = 128	General population with osteoarthritis n = 2216
Age	62.2 (11.6)*	50.6 (18.1)	65.8 (8.7)	66.1 (12.8)
Sex (% of population)	M = 260 (67.5)	M = 7576 (46.3)	M = 75 (58.6)	M = 714 (32.2)
	F = 125 (32.5)	F = 8794 (53.7)	F = 53 (41.4)	F = 1502 (67.8)
Education status (% of population)	*		*	
Did not complete high school	2.6	24.4	3.1	38.5
High school	18.4	12.6	19.5	7.7
Diploma	31.2	32.0	32.8	30.6
University	47.3	27.6	43.8	18.2
Not reported	0.5	3.4	0.8	4.0
Smoking (% of population)	*		*	
Never smoked	60.0	50.8	54.7	44.8
Former smoker	38.2	32.9	43.8	41.7
Current smoker	1.8	16.3	1.6	13.5
BMI	26.5 (4.4)*	28.32 (6.0)	26.82* (4.0)	30.3 (6.5)
K10 score	14.3 (5.08)*	18.2 (15.71)	14.00* (3.9)	18.7 (13.84)
Low	77.4	61.78	76.6	53.9
Moderate	13.5	21.4	15.4	23.7
High to very high	9.1	16.8	7.8	22.4
SF12 Q1 (general health)	*		*	
Excellent	17.1	18.5	7.8	6.7
Very good	45.5	34.3	50.8	25.3
Good	28.0	29.8	33.6	32.4
Fair	6.8	12.3	4.7	22.6
Poor	2.6	5.1	3.1	13.0
Moderate–vigorous physical activity (min/week)	658.1 (649.7)*	286.7 (657.4)	642.5 (556.9)*	156.9 (519.0)

Data presented as Mean (SD), or count (%) where indicated.
NB: K10 score n = 392 in golfers. M = male, F = female, SF12 = Short Form Health Survey, K10 = Kessler 10, BMI = body mass index.
* $p < 0.05$.

K10 scores (both continuous variables) and self-reported general health (categorical), whilst covariates used within the analysis included age (continuous), sex, education status and smoking status (all categorical). Descriptive statistics were used to describe the participants in the AGHS and the AHS. Chi-square tests and Analysis of Variance were used to investigate differences between the characteristics of the participants in the AGHS and AHS. Linear regression was used to estimate the relationship between playing golf and K10 scores, after adjusting for age, sex, education and smoking status. Modified Poisson regression[26] was used to estimate the relative risk (RR) between playing golf and the likelihood of rating general health as good or better, after adjusting for age, sex, education and smoking status. As the outcome of interest (good or better self-rated general health) was not rare, modified Poisson regression was used instead of logistic regression to avoid misinterpretation of odds ratios generated by logistic regression.[27] In sensitivity analyses we additionally adjusted for body mass index (continuous), moderate-to-vigorous intensity physical activity (minutes per week), and self-rated health. Data are reported using means (SD), count (%), relative risk (RR) where indicated, with statistical significance set at $p < 0.05$.

As the golfers and non-golfers were not drawn from the same sample, we performed a sensitivity analysis using inverse probability of treatment weighting (IPTW) to minimise the imbalance in potential confounding variables.[28] The IPTW sensitivity analyses involved first estimating the probability of being in the 'exposed' group (the golfing group) based on age, sex, education level and smoking status, then weighting the analyses by the inverse of the probability of being in the exposed group. All analyses were performed in Stata.[29]

3. Results

A total of 534 participants commenced the Australian Golf and Health Survey, from which 404 provided sufficient data for use in the analysis. A total of 19 participants (4.7 %) had missing data for the psychological distress outcome. As a result of this small amount of missing data, a complete case analysis was performed. Sample size for each analysis is reported in Tables 1, 2 and 3. Demographic data of golfing and general population participants are provided in Table 1.

Golfers were older (62.2 vs 50.6 years) than the general population sample (Table 1). Female golfers made up 33 % of the AGHS sample and 54 % of the AHS sample. Golfers were more physically active than the general population sample, completing 372 min more moderate to vigorous physical activity per week than the general population (658 vs 287 min) (Table 1). Golfers with osteoarthritis were also more

Table 2
The relationship between playing golf and psychological distress.

	All participants (n = 16,755)			Participants with osteoarthritis (n = 2344)		
	Primary analysis Mean difference[a]	Sensitivity analysis Mean difference with MVPA[b]	Sensitivity analysis Mean difference with MVPA, BMI and self-rated health[c]	Primary analysis Mean difference[a]	Sensitivity analysis Mean difference with MVPA[b]	Sensitivity analysis Mean difference with MVPA, BMI and self-rated health[c]
General population	Reference	Reference	Reference	Reference	Reference	Reference
Golfers	−2.5 (−4.1, −0.9)*	−2.3 (−3.9, −0.7)*	−1.9 (−3.5, −0.1)*	−4.0 (−6.5, −1.5)*	−3.5 (−6.0, −1.0)*	−2.2 (−4.8, 0.4)

Data presented as risk ratio (95 % CI).
* $p < 0.05$.
a Adjusted for age, sex, education, smoking status.
b Adjusted for age, sex, education, smoking status, moderate-to-vigorous intensity physical activity.
c Adjusted for age, sex, education, smoking status, moderate-to-vigorous intensity physical activity, BMI and self-rated health.

Table 3
The relationship between playing golf and self-rated health.

	All participants (n = 16,774)			Participants with osteoarthritis (n = 2353)	
	Primary analysis Relative risk[a]	Sensitivity analysis Relative risk with MVPA[b]	Sensitivity analysis Relative risk with MVPA and BMI[c]	Sensitivity analysis Relative risk with MVPA[b]	Sensitivity analysis Relative risk with MVPA and BMI[c]
General population	Reference	Reference	Reference	Reference	Reference
Golfers	1.09 (1.05, 1.13)*	1.07 (1.03, 1.11)*	1.05 (1.01, 1.08)*	1.23 (1.16, 1.32)*	1.19 (1.11, 1.27)*

Data presented as risk ratio (95 % CI).
* $p < 0.05$.
a Adjusted for age, sex, education, smoking status.
b Adjusted for age, sex, education, smoking status, moderate-to-vigorous intensity physical activity.
c Adjusted for age, sex, education, smoking status, moderate-to-vigorous intensity physical activity and body mass index.

physically active than the general population with osteoarthritis, completing on average 485 min more MVPA per week.

On average, golfers scored 3.9 points (95 % CI 2.3 to 5.4) lower than the general population sample on the K10 total score (measure of psychological distress; 14.3 vs 18.2). Golfers on average reported a low level of distress, whilst the general population reported moderate levels of distress (adapted from Andrews and Slade[17]) (Table 1). Playing golf was associated with reduced psychological distress, whereby golf participation was associated with an estimated 2.5 point lower (95 % CI, −4.0 to −2.3) mean K10 score, compared with the general population, after adjusting for age, sex, education and smoking (Table 2). Similar results were observed in the IPTW (−3.2 (−4.0, −2.3)) analysis. The relationship remained after additional adjustment for moderate-to-vigorous intensity physical activity, BMI and self-rated health (sensitivity analyses, Table 2).

Golfers were more likely to report good, very good or excellent overall general health (SF12Q1), when compared to the general population (90.6 % vs 82.6 %). Golfers were 1.1 times (adjusted RR 1.09 (95 % CI) 1.05 to 1.13) more likely to report good, very good or excellent general health (Table 3). Similar results were observed in the IPTW analysis (RR 1.05 (1.01, 1.09)) and sensitivity analyses (Table 3).

Golfers with osteoarthritis reported lower levels of psychological distress (K10 Score 14.0 vs 18.7) compared to the general population-based sample with osteoarthritis (adjusted mean difference −4.0 (−6.5, −1.5)) (Table 2). Results were similar in the IPTW (−5.0 (−6.6, −3.3)) analysis. The relationship remained after additional adjustment for MVPA, and the relationship was uncertain after adjusting for MVPA, BMI and self-rated health (sensitivity analysis, Table 2).

In individuals with osteoarthritis, playing golf was also associated with higher overall general health, whereby 91 % of golfers with osteoarthritis rated their general health as good, very good or excellent, compared to 64 % of the general population with osteoarthritis (Table 1). Golfers with osteoarthritis were 1.3 times (adjusted RR 1.28 95 % CI 1.20, 1.36) more likely to report good or better general health, than the general population with osteoarthritis (Table 3). Similar results were observed in the IPTW analysis (1.40 (1.29, 1.56)) and the relationship remained in sensitivity analyses (Table 3).

4. Discussion

Golfers reported lower levels of psychological distress and better general health than the general population. On average, golfers scored 3.9 points lower on the K10 scale, with golfers reporting a low level of psychological distress, whilst the general population sample reported moderate levels of psychological distress. We found a similar relationship in people with OA whereby golfers with OA were more likely to report low levels of psychological distress, whilst members of the general population with OA were more likely to report more psychological distress, in both un-adjusted and adjusted models.

The meaningful difference in K10 scores can be interpreted in relation to both the average score and distribution of scores within categories. On average, golfers scored 3.9 points lower on the K10 scale, with golfers reporting a low level of psychological distress, whilst general population reported moderate levels of psychological distress.[22] When exploring the proportion of golfers and the general population in each of the categories, 77 % of golfers report low levels of distress, compared to 62 % of the general population, and 9 % of golfers report high to very high levels of distress, compared to 17 % of the general population. The difference between golfers and general population is even more noticeable in those with osteoarthritis, with three times as many non-golfers reporting high to very high levels of distress (22 % vs 8 %). The association between playing golf and lower levels of psychological distress was no longer significant (i.e. 95 % CI included 0) for those with OA after adjusting for age, sex, education, smoking status, BMI, moderate-to-vigorous intensity physical activity and self-rated general health. However, the mean difference (−2.2) and 95 % CI (−4.8, 0.4) remain suggestive of a relationship between playing golf and psychological distress in those with OA. When using the interpretation guidelines, golfers, with lower K10 scores on average, could be considered less likely to be diagnosed with anxiety and affective disorder as previous studies have demonstrated an association between lower K10 scores and a lower probability of meeting DSM-IV criteria.[22]

The relationship between playing golf and overall health is also supported in self-reported overall health. Over 90 % of golfers rate their health as at least good, compared to 82 % of the general population. In populations with OA, 91 % of golfers rated their health as good or better, compared to only 64 % in the general population. Taken together, these results suggest that golf may play a role in maintaining mental health and overall wellbeing, in both those with and without OA. These results are consistent with previous findings of Stenner et al[3] and Murray et al[2] where similar positive relationships between playing golf and measures of wellbeing were reported.

Golfers with OA were very physically active, participating in a similar amount of MVPA per week than golfers without OA. On average, golfers with or without OA performed 372 more minutes of weekly MVPA, compared with the general population. This was despite golfers being an average 11.6 years older than the general population, and literature suggesting PA and sport participation reduce with age in Australia.[30] Although we cannot determine whether this relationship is causative, it is possible that golf participation facilitates physical activity, reduces psychological distress and improves overall perceptions of health. This is an important finding, since people with OA typically have high rates of physical inactivity, as seen in the general population-based sample who performed on average 157 min of MVPA per week, compared to 643 min in golfers with OA. Osteoarthritis is a degenerative disease of the joints, which can have a significant impact on participation in both general physical activity and sport. The loss of joint movement, muscle weakness, swelling and pain can all contribute to a lower likelihood of meeting physical activity guidelines, compared to the general population.[31] Physical inactivity in people with OA can negatively impact mental health and quality of life, as well as increase risk of other chronic conditions such as heart disease, diabetes and obesity.[31] Conservative management of OA, which includes regular physical activity, can improve pain, quality of life and help reduce the impact of risk factors such as obesity.[32] Conservative management of knee arthritis alone is estimated to save over $170 m per annum from avoiding or delaying knee replacement surgery.[14] Our findings suggest that golf is an accessible sport for people with OA, with potential for physical and psychosocial benefits. Longitudinal studies are required to determine whether golf should be promoted as an intervention for individuals with OA, and whether golf participation is effective in increasing physical activity levels, improving mental health and general health in people with OA.

The reasons for lower levels of psychological distress in golfers with and without OA are likely to be complex and multi-faceted. It is important to acknowledge that golf, a sport associated with higher socioeconomic status (SES) is perhaps more likely to attract those with lower levels of psychological distress given the relationship between lower SES and poorer mental health.[33] However, given previous research in golf[34] and other masters sports[5,35] continuing to play an age and ability appropriate sport may improve quality of life and reduce levels of psychological distress. Golf enables participants to compete and participate into older age or with physical limitations, develop abilities and improve, provide a sense of community and facilitate social connections,[3] all of which could contribute to the difference in psychological distress and general health observed in our study. Exercising in a natural, green environment is also known to contribute to both ongoing participation and positive health outcomes.[36] Previous research has identified that being able to exercise through playing golf in a natural environment, is one of the key drivers of participation for older adults.[2]

The age and life stage of participants could have also influenced results. Golfers were older, on average, than the general population, and perhaps more likely to be retired, or closer to the age of retirement. Transition to retirement is also a complex phase of life that can be a positive experience.[8] However, for some, transitioning from working life brings changing life roles, different demands on time, caring responsibilities, and different leisure pursuits. These changes can contribute to both positive and negative mental health and wellbeing.[8] It is acknowledged that working status may have influenced the wellbeing of golf participants, but the specific influence of this factor is unknown.

This study utilised data obtained from a large number of golf participants. Data obtained in the current study are consistent with previously reported golf population data where age, gender, playing history and education status have been described.[3,34] The similarity in data suggests our sample is representative of the golfing population in Australia. Additionally, the comparative data were obtained via a large scale, random, representative sample of Australians. Therefore, the relationships found in our study are likely to be generalisable within Australia. Given the depth and breadth of the data within both the AGHS and AHS, the analysis included key confounders that are known to influence general health and psychological distress, which is a key strength of this study. Despite these strengths, this study has limitations that need acknowledgement. The data are cross-sectional in nature, and despite the strength of the relationships identified, no causal link can be made using the existing data. Whilst valid and reliable self-reported measures were used, objective data such as GPS or accelerometry were not used to assess levels of physical activity. Using self-reported measures of physical activity can be a source of error, given the potential for participants to misrepresent the amount of activity completed. However, these self-reported measures can be used as proxy for GPS or accelerometry, particularly in instances such as this where large-scale objective measurement is not feasible.[37]

The AHS data only used one item from the SF12. Therefore, we were limited to utilising only one item of the SF12 as a crude measure of general health. As such, validity of the one item has not been established, nor can overall instrument validity be used to support its use. The full SF12 survey would have provided a more accurate and complete picture of health-related quality of life. The AHS did not collect data on the type of physical activity that respondents participated in. It may be that a proportion of these participants were golfers, however we were unable to determine this, and given the random nature of the sample and sample size, the impact of a small proportion of golfers within the AHS dataset is negligible. Additionally, other medical conditions that may influence outcomes were not collected during this study. Likewise, the use of other modalities such as pharmacological, psychological, physiotherapy and/or surgical intervention was not available within the data. These data were not included in the analysis, and it is important to acknowledge that these factors may have influenced the results. Future studies should endeavour to capture other medical and treatment data to explore firstly whether these are different between golfers and non-golfers, and if different, whether there is an effect of these variables on health and wellbeing outcomes.

5. Conclusions

We found a positive relationship between playing golf, lower levels of psychological distress and better health-status. Golfers with OA also reported reduced psychological distress and a higher general health compared to a general population-based sample with OA.

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Confirmation of ethical compliance

Informed consent and ethical approval.

Prior to the commencement of the study, this project was approved by University of South Australia Human Research Ethics Committee (Approval 201547).

CRediT authorship contribution statement

Brad J. Stenner: Conceptualization, Data curation, Formal analysis, Investigation, Methodology, Project administration, Writing – original draft, Writing – review & editing. **Terry Boyle:** Data curation, Formal analysis, Investigation, Methodology, Writing – review & editing. **Daryll Archibald:** Conceptualization, Investigation, Writing – original draft, Writing – review & editing. **Nigel Arden:** Conceptualization, Supervision, Writing – review & editing. **Roger Hawkes:** Conceptualization, Supervision, Writing – review & editing. **Stephanie Filbay:** Conceptualization, Investigation, Methodology, Supervision, Writing – original draft, Writing – review & editing.

Declaration of interest statement

None.

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