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Does Sports Club Participation Contribute To Health-Related Quality Of Life?

Running title: Contribution of sport to quality of life

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Abstract

Given the social nature of participation in sport, we hypothesised that club sports participants would have greater well-being and quality of life than participants in other forms of physical activity (PA).

Purpose: To examine Health Related Quality of Life (HRQoL) and life satisfaction in women who participate in three contrasting forms of PA; club sport, gym activities and walking.

Methods: This was a cross-sectional study of the relationship between type of physical activity setting and measures of HRQoL (SF-36) and life satisfaction in 818 women living in rural Victoria, Australia in 2007. Data were also compared with those from a normative sample of 2345 women.

Results: After adjustment for potential confounders (age, education, marital status, children aged <16 years, perceived financial stress, level of recreational PA), four of the eight SF-36 subscales, the SF-36 mental health component summary score and life satisfaction were significantly higher in the club sport group than in the other groups.

Conclusion: Although cross-sectional research cannot establish causal links, the results suggest that participation in club sport may enhance the health benefits of PA.

Keywords: Sports, women, rural, physical health, mental health, physical activity

Introduction

1 Several studies have reported on the associations between participation in physical activity (PA) and health-related quality of life (HRQoL) (5, 7, 8, 15, 17, 19, 21). Most of these have used the 36-item Short-Form Health Survey (SF-36) (33), which is a comprehensive, validated measure of health-related quality of life, with eight subscales (physical functioning; role-physical; bodily pain; general health; vitality; social functioning; role-emotional; and mental health) and two summary scores (the physical component summary (PCS) and mental component summary (MCS)) (32, 33). Most previous studies have reported positive associations between PA and the general health (5, 15, 19), social functioning (5, 19) and vitality (5, 19, 35) subscales, in general population samples, but with the exception of walking (5), they have not examined the relationships between participation in different *types* of PA and HRQoL.

2 In Australia, most of the evidence on relationships between PA and HRQoL has come from the Australian Longitudinal Study on Women's Health (ALSWH) (8, 9, 19). As the ALSWH uses a generic measure of participation in walking and in moderate and vigorous intensity PA, the data cannot be used to provide insight into the associations between different types of PA, such as playing sport and going to the gym, and HRQoL. This is important, because, in Australia, nearly 30% of people aged 15 years and over participate in organised sport or recreation through a community sports club or organisation (2).

3 A positive aspect of participation in club-based sport is that those adults involved in sports clubs are significantly more likely to achieve recommended levels of PA than those who are not (16). As community sports clubs provide opportunities for social interaction through both structured (organised and competitive) and unstructured (social) participation in

sport, (14) it has been suggested that involvement in club sport may impact positively on social and mental well-being (27, 29, 31). For example, clubs may work as social catalysts, leading to enhanced involvement and participation (24), with potentially greater physical and mental health benefits from club sport participation than from other forms of PA (26, 30). It has been reported that elements of social and mental well-being, such as social connectedness, social support, peer bonding, increased life satisfaction and self-esteem may reduce stress, anxiety and depression, and can be enhanced by participation in organised sport (10, 26, 27, 29, 30). Relationships between participation in club-based sport and HRQoL have not however been examined.

4 The sport sector is beginning to adopt health promotion principles through the establishment of strategies such as the development of Healthy and Welcoming Environments (HWE) (13). The HWE strategy incorporates social support principles and policies through a 'welcoming and inclusive environment' component, which focuses on engagement and maintenance of club participants (13). These principles are well supported in the PA literature, as social support has been identified as a determinant for PA engagement and maintenance, and the promotion of PA in a social context is endorsed (27, 28).

5 Because women are less likely to be physically active than men (3), and given that women living in rural areas have poorer health (34) and higher rates of overweight and obesity (4, 9) than their metropolitan counterparts, women living in rural areas were the focus of this study. Among adult women living in Victoria, walking is the most common form of PA, with 32.7% reporting participation in walking for exercise. The next most common type of PA for women in this age group is aerobics/fitness (15.2%). The most popular sports played by Victorian women are netball (5.2%) and tennis (4.9%). Of all types of sports and

physical recreation activities, these sports rank 4th and 5th in participation rates (2). Because of their relative popularity in Victoria, tennis and netball were selected as the club sports of interest, and walking and gymnasium-based activities were selected as the other forms of activity.

6 The main aim of this research was to compare levels of HRQoL and life satisfaction in members of sporting clubs and those who participate in other common forms of PA. Given the suggested benefits of participation in sports clubs and teams on many aspects of social and mental well-being, we hypothesised that HRQoL and life satisfaction would be greater among sports club participants than among those who participate only in the more individual physical activities and members of a normative population of women.

Methods

Design

7 This cross-sectional survey was designed to compare HRQoL and life satisfaction in female participants in three types of PA: active participation in a sport club (tennis or netball), in gymnasium-based programs, and in leisure-time walking (alone, in a group of up to three participants or with a dog).

Insert Table 1 about here

Participant recruitment

8 Participants were recruited from three settings in and around a rural city (population 88,137) in the state of Victoria, Australia: tennis and netball clubs; commercial public gymnasiums; and an established walking track around a lake. Women in each setting were

approached by the researchers either before or after their activity. If they were aged 18 years or over, they were invited to complete the written self-report survey, which took up to ten minutes to complete. Survey participants were informed that the study sought to investigate relationships between PA and well-being in women. In accordance with University Ethics Committee regulations, participant consent was implied by completion of the survey. The research was endorsed by the two relevant sports governing bodies (Tennis Victoria and Netball Victoria), local associations and gymnasium managers.

9 Data from the “young” and “mid-age” cohorts of Wave 4 of the Australian Longitudinal Study on Women’s Health (ALSWH) (37) were used as a reference group for comparative purposes. Data from ALSWH participants living in rural Victoria who indicated that their health did not now limit them in bathing or dressing themselves were included.

Measures

10 The outcome measures, (dependent variables – DVs) were the eight SF-36 sub-scales and the PCS and MCS summary scores (33), and the ALSWH Life Satisfaction score (37, 38). For the Life Satisfaction score, respondents were asked how satisfied they are with what they have achieved in each of nine areas of their lives: work, career, study, family relationships, partner/closest personal relationship, friendships, social activities and motherhood/children. Responses are on a 4 point Likert scale: very satisfied, satisfied, dissatisfied, very dissatisfied. Responses to the nine items were averaged to derive a mean score for life satisfaction, with a higher score indicating greater life satisfaction.

For all DVs a higher score represents a greater level of health related well-being. The primary explanatory variable was type of activity. Many survey respondents participated in more than

one of the three forms of activity, and many sports club participants participated in sports other than the setting in which they were recruited and surveyed. In light of the hypothesised benefit of involvement in structured PA settings such as clubs on participant social and mental well-being, participants were allocated to one of three mutually exclusive categories, in descending order of the level of organisation and structure of the setting. These were: Club - all sports club participants (who may also participate in gymnasium or walking); Gymnasium - gymnasium participants who are not sports club participants (but may be walkers); and Walk - walking participants who are not gymnasium participants or sports club participants. The first category was predominantly made up of tennis and netball players, recruited in club settings, but also included a small number of players of other sports recruited in the gymnasium or walking settings.

11 The potential confounders were age, education level, marital status, having children aged less than 16 years, perceived financial stress, and overall recreational PA level. The last of these was calculated as the total duration of recreational PA in sporting club, gymnasium and walking settings in the week prior to the survey.

Statistical analyses

12 Analysis of variance (ANOVA) was used to investigate differences between groups with respect to the 11 DVs. Analysis of covariance (ANCOVA) was used to adjust differences for the effects of the potential confounders. The primary 3-group analysis was based on the data collected in the current study, with data from the club category used as the referent for pairwise comparisons with the other two groups. A separate 4-group analysis, which also included the ALSWH data, was conducted in order to compare the three study samples with the independently established norms for rural Victoria from the ALSWH. This

analysis was undertaken separately for two reasons. Firstly, for all DVs, the variance within the more broadly-based ALSWH group was larger than for the three study groups, which violates the assumption of constant error variance underlying ANOVA, and is likely to result in overestimation of p-values and hence lead to conservative conclusions regarding differences between means; and secondly, it was not possible to include overall PA level and education level as confounders in the 4-group analysis, because in the ALSWH a different measure of overall PA was used, and concurrent data on education level was not available for one of the two cohorts used for reference (mid-age).

13 There is evidence to indicate that a difference of around 2-3 points on the standardised MCS scale of the SF-36 (for which the normative SD = 10) represents a clinically significant difference in well-being (1, 19). Setting $\alpha=0.05$, power=0.80, SD=10 and a target difference of two points between adjacent group means led to target sample sizes of approximately 122 in each of the three activity categories, or a total sample size of 366. However, because of the hierarchical relationship of the categories, and in the absence of any prior information about the proportions of participants engaged in multiple types of activity, it was anticipated that many participants recruited in gymnasium or walking settings would be allocated into the club group, leading to imbalance and consequent loss of efficiency. In order to achieve adequate sample sizes in each of the three sub-samples, the overall recruitment target was doubled to 732, and the proportions in the gymnasium and walking categories were monitored as sampling proceeded.

14 The research was approved by the University of Ballarat Human Research Ethics Committee.

Results

15 Of 1173 persons approached, 818 (69.7%) completed the survey. Response rates were: 358 of 388 (92.3%) in tennis and netball clubs; 225 of 298 (75.5%) in commercial public gymnasiums; and 235 of 487 (48.3%) for walkers. After assignment of each participant to the appropriate PA group, as described in the Methods section, and the exclusion of 25 respondents who provided insufficient information, the sample sizes were as shown in Table 1.

16 The demographic characteristics of the women in the three samples and the ALWSH participants are shown in Table 1. The group with the highest mean age was the ALSWH group. Women in the ALSWH group were also more likely than women in the other groups to be in a married or de facto relationship. Those in the walking group were more likely to be married or in a de facto relationship than those in the club group. University-educated women were well represented, particularly in gymnasium and walking groups. Walking participants had lower overall levels of recreational PA than sports club or gymnasium groups.

Insert Table 1 about here

17 In unadjusted analyses (results not tabulated), the 3-group comparison showed significant differences between the club group and the gymnasium and/or walking group(s) for eight of the 11 DVs, with the club group having higher scores in each case.

18 Notwithstanding the fact that the groups differed with respect to the characteristics summarised in Table 1, most of the significant difference in the DVs between groups

persisted after adjustment for any effects of these characteristics. Table 2 shows that after adjusting for six potential confounders there were significant differences between groups for six of the 11 DVs: four of the SF-36 subscale scores (Physical Role Functioning ($p=0.008$); Vitality ($p=0.01$); Social Functioning $p=0.022$); Mental Health ($p=0.009$)) as well as for the Mental Health Component Score ($p=0.008$) and the Life Satisfaction score ($p=0.002$). In each case the club group had the highest mean score, with significant differences between club and gymnasium groups for all six variables, and between club and walk groups for three variables.

Insert Table 2 about here

19 The 4-group analysis showed significant differences between the ALSWH group and the club group for all variables except the General Health subscale score. In each case the club group had a significantly higher mean score. In addition there were significant differences between ALSWH and gymnasium groups for Bodily Pain, Vitality and PCS, and between ALSWH and walk groups for Life Satisfaction. In all cases the study groups had higher mean scores than the normative ALSWH group.

Discussion

20 This is the first study to examine relationships between HRQoL, life satisfaction and participation in different types of PA. The results showed that club sport participants had higher scores on the majority of indicators than gymnasium and walking participants. The hypothesis that the HRQoL and life satisfaction of sports club participants would be greater than those who participated in only gymnasium and/or walking activities was generally supported. Although there were considerable differences between the groups with respect to

six potential confounders, after adjusting for confounders, most DVs were significantly higher in the sport club group than in the gymnasium and/or walk groups. Notably, the mean difference in MCS scores between sports club and gym groups (adjusted 2.58) is of a magnitude which has been identified as representing a clinically significant difference in mental well-being (1, 19).

21 A further feature of this study was the addition of the ALSWH sample of women which allowed a comparison with HRQoL levels in a normative sample of women; for most measures, scores were higher in the club group than in the ALSWH sample. It was not surprising that there was only one significant difference between the walking group and the ALSWH sample, because the latter group included a large proportion of women who walk (6). Blacklock et al. (5) also found that HRQoL scores were similar for their walking and general physical activity (inclusive of walking) groups, with the exception that General Health scores were greater for the general PA group than the walking group.

22 Our results indicate that participation in club sport is associated with better levels of mental well-being and life satisfaction, than are seen in women who engage in predominantly individual-based activities such as going to a gymnasium or walking. Not surprisingly, there were no significant differences between the physical health (Bodily Pain, Physical Functioning) of the three groups, given that all forms of PA confer physical benefits, and a certain level of physical health is required to participate in PA generally. The club group as defined in this study included some women who also participated in gymnasium-based and walking activities. Nevertheless there were many significant differences between the club group and the gymnasium group. As Blacklock and colleagues suggest, in reference to general health, it seems that doing PA over and above regular walking may produce

additional benefits (5).

23 The results of the current study support the notion that being active in a socially engaged manner, whilst not preferable for all, can contribute to mental well-being (27, 29, 31), with specific evidence of improvements in HRQoL and life satisfaction. As has been reported by other researchers (10, 26, 27, 29, 30) these mental health benefits may result from the enhancement of social connectedness, social support and peer bonding, life satisfaction, and self-esteem which may be provided by club sport.

24 Several researchers make a strong argument that enjoyment of PA is critical for mental health gain (10, 28). Furthermore, if an activity is enjoyable and coupled with social support, there is an increased likelihood of maintenance (10, 28)}. When sports clubs provide a welcoming and inclusive environment, it is possible that engagement in club sport may enhance this key element to promote sustainable forms of PA.

25 With reference to ecological models (25), research into PA, particularly into the adoption and maintenance of PA, has focused primarily on the intrapersonal and interpersonal aspects and not on organisational and physical environments. Improved understanding of supportive organisational environments in relation to choices of PA could assist in the development of strategies for increasing PA for the general population, with particular reference to the promotion of participation in club sport. The sporting sector has only recently been identified as a potential setting for health promotion (12, 13, 18). Given the large number of participants, the extent of community reach and 'healthy participation in PA' culture of the community sport sector, there is significant potential for this sector as a setting in which to promote health to the general population (11, 12, 23).

26 Recent efforts to curb obesity levels have focused heavily on walking as a form of PA, with intrapersonal, interpersonal and environmental promotional strategies being employed. Walking is inexpensive and can be easily carried in a range of settings. It appears, however, that walking alone may not produce the additional mental health benefits that can potentially be gained through club sport participation. Strategies should therefore be developed and promoted to encourage people to participate in club sport where both mental and physical health benefits can be achieved. In saying that, sporting clubs should develop specific strategies to encourage and welcome involvement from a wide variety of population groups and levels of ability. In addition to efforts to encourage currently inactive people to become more active, greater effort to maintain participation is required for those who commence participation in sport club-based PA. Social support through interaction with others can clearly be beneficial. Promotion of sport participation which includes social interaction may assist engaging the least active population groups (22).

Study limitations

27 Although this study has extended our understanding of the relationships between PA and HRQoL, the cross-sectional design means that better health outcomes cannot be attributed directly to involvement in a sporting club. The converse could also apply - that those with better health are more attracted to participation in sports clubs. Because participation in the survey was voluntary, it is also possible that there could be a bias due to participants willing to answer questionnaire having higher HRQoL than those who declined participation. Any such response bias might have also affected the strength of association between type of PA and HRQoL, since the response rate was highest in the sport club group and lowest in the walking group. Furthermore, the delimitations of the study, including the

particular geographical location and PA settings selected, potentially limit the generalisability of the results.

Conclusion

28 The World Health Organisation defines health as the state of complete physical, mental and social well-being (36). We have shown that participation in sport is associated with better mental well-being, than other forms of PA. Although cross-sectional research cannot definitively establish a causal link, our results suggest that sport club settings are likely to enhance the health benefits of PA, and hence provide support for the notion that club sport is a beneficial setting for health promotion. Given the obesity epidemic in the general population (20), the fact that sport is available to general population, and the associated benefits of the social nature of participation, it is recommended that sport for health is promoted. Many different sports are available and accessible to people throughout the community. Sport clubs and organisations must however develop strategies to attract people who face health and social barriers to participation, if they are to capitalise on the opportunities of promoting health through sport participation.

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The results of the present study do not constitute endorsement by ACSM.

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Table 1. Characteristics of participants

	Group ¹			
	Club	Gymnasium	Walk	ALSWH
Sample size (n)	499	185	109	2345
Age (years) Mean ± SD	33.9 ± 13.7	38.5 ± 12.9	44.5 ± 13.2	46.8 ± 11.9
Married/de facto (%)	54	57	73	98
Children under 16 years (%)	39	32	45	23
Total duration of recreational PA in sporting club, gymnasium and walking settings in the week prior to the survey (hours)	5.6 ± 5.3	5.0 ± 6.0	2.5 ± 2.6	NA
Mean ± SD				
Ability to manage on income				
It is impossible (%)	2	1	3	2
It is difficult all the time (%)	10	7	10	9
It is difficult some of the time (%)	24	26	20	29
It is not too bad (%)	47	46	42	44
It is easy (%)	17	20	25	15
Highest educational level attained				
Secondary school not completed (%)	14	12	18	NA
Completed secondary school (%)	33	20	15	NA
Trade/apprenticeship/ certificate/diploma (%)	21	21	23	NA
University degree (%)	23	25	25	NA
University higher degree (%)	10	21	20	NA

Data are mean ± SD or percent. NA Not available

1. Club group: all sports club participants, including those who also participate in gymnasium or walking. Gymnasium group: includes gymnasium participants who also walk. Walking group: consists of those who walk only. ALSWH group: young and mid-age rural Victorian cohorts from wave 4 of the Australian Longitudinal Study on Women's Health.

Table 2. Means of 11 measures of health-related quality of life (HRQoL): by group, adjusted for six confounders (age, education¹, marriage, children, financial stress, overall level of recreational physical activity¹)

	Group²	nMean	95%CI	Sig³	Sig⁴
SF-36 Physical functioning scale	Club	45589.90	86.65 – 93.15	Referent	*
	Gymnasium	15788.93	85.04 – 92.82		
	Walk	8787.55	83.09 – 92.02		
	ALSWH	224583.53	81.96 – 85.10		Referent
SF-36 Physical role functioning scale	Club	45886.79	81.37 – 92.21	p=0.477 Referent	P<0.001 *
	Gymnasium	15979.82	73.36 – 86.29	*	
	Walk	8979.64	72.24 – 87.04	*	
	ALSWH	225071.13	68.04 – 74.21		Referent
SF-36 Bodily pain scale	Club	45977.03	72.92 – 81.13	p=0.008 Referent	p<0.001 *
	Gymnasium	15976.81	71.94 – 81.68		*
	Walk	8974.03	68.47 – 79.59		
	ALSWH	226068.08	66.12 – 70.04		Referent
SF-36 General health scale	Club	45770.98	67.44 – 65.46	p=0.477 Referent	p=0.003 *
	Gymnasium	15867.58	63.33 – 71.79		
	Walk	9068.08	63.25 – 71.92		
	ALSWH	222967.95	66.20 – 69.69		Referent
				p=0.090	p=0.25

SF-36 Vitality scale	Club	45962.06	58.66 – 65.46	Referent	*
	Gymnasium	15856.58	52.51 – 60.65	*	*
	Walk	8957.50	52.51 – 60.65	*	
	ALSWH	225551.63	52.84 – 62.17		Referent
SF-36 Social functioning scale	Club	45781.67	77.09 – 84.26	P=0.001 Referent	p<0.001 *
	Gymnasium	15776.84	72.58 – 81.11	*	
	Walk	8976.16	71.31 – 81.01	*	
	ALSWH	226074.19	72.24 – 76.14		Referent
SF-36 Emotional role functioning scale	Club	45774.78	68.91 – 80.65	p=0.022 Referent	p<0.001 *
	Gymnasium	15969.71	62.72 – 76.71		
	Walk	8868.83	60.81 – 76.85		
	ALSWH	224872.45	69.46 – 75.44		Referent
SF-36 Mental health scale	Club	45871.25	68.33 – 74.18	p=0.091 Referent	p=0.019 *
	Gymnasium	15867.17	63.66 – 70.68	*	
	Walk	9067.96	63.96 – 71.96		
	ALSWH	225367.26	65.75 – 68.77		Referent
SF-36 Physical health component score (PCS)	Club	44653.27	51.82 – 54.72	p=0.008 Referent	p=0.001 *
	Gymnasium	15552.81	51.08 – 54.54		
	Walk	8252.44	50.45 – 54.54		
	ALSWH	220249.42	48.62 – 50.21		Referent
				p=0.587	p=0.004

SF-36 Mental health component score (MCS)	Club	44645.72	43.88 – 47.55	Referent	*
	Gymnasium	15543.14	40.95 – 45.33	*	
	Walk	8243.87	41.35 – 46.39		
	ALSWH	220243.96	43.01 – 44.90		Referent
Life Satisfaction	Club	4603.13	3.04 – 3.22	Referent	p=0.008 p<0.001 *
	Gymnasium	1582.97	2.86 – 3.07	*	
	Walk	903.06	2.94 – 3.17		*
	ALSWH	22352.91	2.87 – 2.96		Referent
				p<0.001	p<0.001

1. The 4-group analyses (see Note 4) did not incorporate adjustment for overall level of recreational physical activity and educational qualifications. This is because of incompatibility between the measures employed in the Australian Longitudinal Study on Women's Health and in this study.
2. Club group: all club participants, including those who also participate in gymnasium or walking. Gymnasium group: includes gymnasium participants who also walk. Walking group: consists of those who walk only. ALSWH group: young and mid-age rural Victorian cohorts from wave 4 of the Australian Longitudinal Study on Women's Health.
3. Based on a 3-group ANOVA (ALSWH excluded) with six covariates. The club group is the referent for pairwise comparisons. * Pairwise p<0.05
4. Based on a 4-group ANOVA (ALSWH included) with four covariates. The ALSWH group is the referent for pairwise comparisons. * Pairwise p<0.05