

Importance of activity and recreation for the quality of life of patients treated for cancer of the head and neck

S.N. Rogers^{a,b,*}, A. Travers^b, D. Lowe^c, A.R. Levy^d, A.W. Midgely^e

^a Evidence-Based Practice Research Centre (EPRC), Faculty of Health and Social Care, Edge Hill University, St Helens Road, Ormskirk, L39 4QP

^b Regional Maxillofacial Unit, University Hospital Aintree, Liverpool, L9 1AE, UK

^c Evidence-Based Practice Research Centre (EPRC), Faculty of Health, Edge Hill University, St Helens Road, Ormskirk, L39 4QP

^d Department of Psychology, Edge Hill University, Ormskirk, L39 4QP, UK

^e Department of Sport & Physical Activity, Edge Hill University, Ormskirk, UK

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Abstract

The ability of patients to participate in recreational activities is an important facet of health-related quality of life (HRQoL) after treatment for cancer of the head and neck. The aim of this study was to analyse patients' responses to the activity and recreation domains of the University of Washington quality of life questionnaire (UW-QoL), and to relate them to clinical characteristics, the intensity of leisure-time exercise/week, perceived barriers that interfere with exercise, and feeling able to participate in an exercise programme. Other questionnaires used were the Godin Leisure-Time Exercise questionnaire, the Perceived Exercise Barriers questionnaire, and the Exercise Preferences questionnaire. The survey sample comprised 1021 patients of whom 437 responded (43%). Of them, 9% reported a serious problem with activity and 8% with recreation. The main influencing factors were site (oropharynx), advanced stage, radiotherapy and chemotherapy, composite flap, gastrostomy tube, and coexisting conditions. Low (worse) scores in the UW-QoL activity and recreation domains were associated with little time spent exercising, low-intensity exercise, more barriers to exercising, and a lack of preference. The use of the UW-QoL in follow-up assessments can help to identify patients who are having difficulties in these two domains, as well as those who feel able to participate in an exercise programme. Further research is required to optimise the interventions that will promote exercise and improve recovery and wellbeing.

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Introduction

Physical, functional, emotional, and social dysfunctions after treatment for cancer of the head and neck have an enormous impact on a patient's quality of life (QoL).¹ Problems with

speech and swallowing, xerostomia, and shoulder dysfunction, can have detrimental effects on activity and recreation, as can fatigue, pain, and morbidity after free tissue transfer.^{2,3} Anxiety, low mood, lack of self-esteem, and poor body image, can compromise social and recreational functioning and lead to social isolation.⁴

Activity and involvement in recreational pursuits aid recovery and improve wellbeing, and interventions that aim to improve exercise might also improve QoL.⁵ Patients with cancer of the head and neck, however, can find exercise more challenging than those with other cancers because of age,

* Corresponding author at: Regional Maxillofacial Unit, University Hospital Aintree, Liverpool, L9 1AE, UK.

E-mail addresses: simonn.rogers@aintree.nhs.uk (S.N. Rogers), andrew.travers1@nhs.net (A. Travers), astraglobeltd@btconnect.com (D. Lowe), andy.levy@edgehill.ac.uk (A.R. Levy), Midgely@edgehill.ac.uk (A.W. Midgely).

Table 1
Activity and recreation domains of the University of Washington quality of life (UW-QoL) questionnaire.

Score	Domain	No. (%)
	Activity (n = 423):	
100	I am as active as I have ever been	144 (34)
75	There are times when I can't keep up my old pace, but not often	118 (28)
50	I am often tired and have slowed down my activities although I still get out	149 (35)
25	I don't go out because I don't have the strength	9 (2)
0	I am usually in bed or chair and don't leave home	3 (1)
	Activity important during the past 7 days	78 (18)
	Serious problem/dysfunction (algorithm ^a) with activity	39 (9)
	Recreation (n = 425):	
100	There are no limitations to recreation at home or away from home.	172 (40)
75	There are a few things I can't do but I still get out and enjoy life	170 (40)
50	There are many times when I wish I could get out more, but I'm not up to it	57 (13)
25	There are severe limitations to what I can do, mostly I stay at home at watch TV	22 (5)
0	I can't do anything enjoyable	4 (1)
	Recreation important during the past 7 days	46 (11)
	Serious problem/dysfunction (algorithm ^a) with recreation	32 (8)

* Serious domain problem/dysfunction is denoted by a domain score of <50, or a score of 50 if also chosen as important during the previous week.

coexisting conditions, life style (smoking and alcohol), neck dissection, and morbidity after free tissue transfer.²

Questionnaires on health-related quality of life (HRQoL) after treatment for cancer of the head and neck usually include items on activity and recreation.⁶ The University of Washington quality of life version 4 (UW-QoL4),⁷ which is commonly used and specific to the disease, has included both domains since its first publication in 1993.⁸ The wording of the activity domain relates to often being tired, slowed down, having reduced strength, and being house bound. That of the recreation domain refers to going out, staying at home, enjoying life, and doing enjoyable things. The two domains correlate with “mobility” and “usual activity” in the EuroQol-5 D (EQ-5D).⁹ Clinically, it would be useful to identify patients who score particularly badly. The aim of this study therefore was to analyse patients' responses to the activity and recreation domains of the UW-QoL questionnaire, and to relate them to clinical characteristics, intensity of leisure-time exercise/week, perceived barriers that interfere with exercise, and feeling able to participate in an exercise programme.

Method

We used the head and neck cancer database at the University Hospital, Aintree to identify patients who had been treated for primary squamous cell cancer (SCC) of the head and neck between 2010 and 2014. They were at least 18 years of age, and did not have dementia or any other mental condition that could affect their ability to complete the questionnaires. Patients with cutaneous and salivary gland cancers who were treated palliatively, or those with ongoing recurrence and disease, were excluded.

In February 2016 we posted questionnaires to all patients known to be alive and disease free, and sent reminders four weeks later. The package contained a covering letter about the

survey, instructions on how to complete the questionnaires, and a stamped addressed envelope for return. Details such as age, sex, year of diagnosis, and treatment (operation, radiotherapy, chemotherapy) were obtained from medical records.

The UW-QoL version 4⁷ consists of 12 single-question domains, which have between three and six response options that are scaled evenly from 0 (worst) to 100 (best). Another question asks patients to choose up to three domains that were most important to them in the previous week. We also used criteria derived from earlier work⁹ to establish the domains in which patients had a “serious problem or dysfunction” (these criteria were based on a mix of the scores and importance of the domain). The activity and recreation domains each have five hierarchical response options. Scores of 0, 25, or 50 (if also chosen as important in the previous week) indicate a serious problem or dysfunction (Table 1).

The intensity of leisure time exercise/week was measured by the validated, self-reported Godin Leisure-Time Exercise questionnaire,¹⁰ which includes questions about frequency and duration of exercise that is strenuous (for example, running, jogging, football, squash), moderate (for example, fast walking, tennis, easy bicycling, easy swimming), and mild (for example, easy walking, yoga, fishing, bowling, golf). The total score (T) for weekly leisure activity was calculated from the weekly frequencies of strenuous, moderate, and mild activities as follows:

$$T = (9 \times \text{strenuous}) + (5 \times \text{moderate}) + (3 \times \text{mild}).$$

The Perceived Exercise Barriers questionnaire¹¹ comprises 37 potential barriers, 33 of which were used in our study; the other four were depression/anxiety, feeding tube, difficulty drinking, and lack of transport. Responses were scored on a Likert scale from 1 (never) to 5 (very often). Feeling able to participate in an exercise programme was

Table 2
Activity and recreation domains of the University of Washington quality of life (UW-QoL) questionnaire.

	Recreation			Total
	Serious problem (algorithm*)	Somewhere between	Best response (100) “There are no limitations to recreation at home or away from home”	
Activity:				
Serious problem (algorithm*)	11	26	2	39
Somewhere between	19	175	45	239
Best response (100) “I am as active as I have ever been”	0	19	124	143
Total	30	220	171	421

* Significant problem/dysfunction is denoted by a domain score of <50, or a score of 50 if also chosen as important during the previous week.

measured by the Exercise Preferences questionnaire¹¹ with options of “yes”, “maybe”, and “no”.

The kappa coefficient of agreement¹² was used to measure agreement between the activity and recreation categories (Table 2). For both, the chi squared test was used to compare patients’ demographic and clinical subgroups (Table 3), Godin exercise categories (Table 4), perceived barriers to exercise (Table 5), and feeling able to participate in an exercise programme (Table 6). Because of the large number of statistical tests, the level of significance was regarded as $p < 0.01$. Missing data for different aspects of the questionnaire package are reflected in differing denominators. Analyses were done with the help of IBM SPSS Statistics for Windows version 19 (IBM Corp).

The study was approved by the Cambridge South NHS Research Ethics Committee (Ref. 15/EE/0429).

Results

The survey sample (January 2010 - October 2014) comprised 1021 eligible patients. Of them, 437 (43%) responded, but seven were not included in the analysis because data were missing. Although the response rate was lower in patients who were under 55 (29%) and over 85 years of age (36%), it was generally between 36% and 50% with no obvious biases by sex, time from diagnosis, tumour site, diagnosis of SCC, clinical TN staging, treatment group, and free flap. Three-quarters (317/430, 74%) of the patients were male and the median (IQR) age at survey was 66 (60-73) years. Primary tumours were oral ($n = 122$, 28%), laryngeal ($n = 86$, 20%), oropharyngeal (176, 41%), and other ($n = 46$, 11%). The clinical T stage of 113/421 (27%) was late (stages 3-4), and 164/423 (39%) patients had invaded nodes. The primary diagnosis in 347/385 (90%) was SCC. Primary treatment comprised operation alone ($n = 175$, 41%), operation with adjuvant radiotherapy or chemotherapy ($n = 143$, 33%), or primary chemoradiotherapy alone ($n = 112$, 26%). One quarter of the patients had free flaps (72/313, 23%).

Fifty-one of 415 (12%) patients had had recurrence and 326/420 (78%) had had operations at some point. A total of 291/416 (70%) had had radiotherapy, 113/415 (27%) chemotherapy, and 30/418 (7%) currently had a feeding tube

into their stomach. Two-thirds (269/399, 67%) had left full-time education at 16 years of age. The median (IQR) time from diagnosis to survey was 43 (30-58) months.

Responses to items in the activity and recreation domains of the UW-QoL are shown in Table 1. On domain scores of 0, 25, or 50 (if also chosen as important during the previous week), 39/423 (9%) had a serious problem with activity and 32/425 (8%) with recreation. A total of 58/421 (14%) had a problem in one domain, and 11/421 (3%) had problems in both. Table 2 shows three levels of response in each domain. A kappa coefficient of agreement of 0.53 (SE 0.04) indicated a moderate level of agreement between the two domains, but also differences in dysfunction.

Several baseline factors (notably site of oropharyngeal tumour, advanced clinical stage (T3-4), clinically invaded nodes, and chemotherapy or radiotherapy) at the time of the primary diagnosis were associated with low levels of activity (Table 3). Responses to items in the recreation domain varied less than those in the activity domain. Scores for function in the recreation domain were lower in patients with advanced clinical T3-4 disease, treatment that involved chemoradiotherapy, and in those who had free flaps (notably composite flaps). Scores for both activity and recreation were also lower in those who had had radiotherapy or chemotherapy, and who currently had a feeding tube in the stomach or other medical conditions. Scores for both were higher in patients who had remained in education beyond the age of 18. There were no associations of note regarding diagnosis of SCC (compared with “other”), year of diagnosis, recurrence, or operation (results not shown).

The lower the level of activity and recreation, the lower the intensity of leisure-time exercise/week (Table 4). Most of those who had serious problems with activity (21/36) and recreation (28/31) did not exercise even mildly for 15 minutes a week. Conversely, of those who did not exercise, 21/140 (15%) had a serious problem with activity and 28/143 (20%) with recreation. The lower the levels of these two domains, the more prevalent were the barriers that patients thought could, or did, interfere with their ability to exercise (Table 5). These comprised physical barriers such as a dry mouth, drainage of the mouth, fatigue, problems with eating, drinking, and swallowing; nausea, reduced intake of food, pain, and muscle and shoulder weakness; also shortness of breath, cough, difficul-

Table 3
Demographic and clinical factors at time of diagnosis and at survey, and response to the activity and recreation domains of the University of Washington quality of life (UW-QoL) questionnaire.

	Activity					Recreation				
	No. of patients	Serious problem (%)	Somewhere between (%)	Best response (%)	Chi squared p value	No. of patients	Serious problem (%)	Somewhere between (%)	Best response (%)	Chi squared p value
All patients	423	9	57	34		425	8	52	40	
Baseline data:										
Sex:										
Male	314	10	57	33	0.86	313	9	52	39	0.06
Female	109	8	56	36		112	3	52	46	
Site of tumour:										
Oral cavity	120	8	52	41	0.003	121	5	55	40	0.61
Laryngeal	83	7	45	48		85	9	44	47	
Oropharyngeal	174	11	66	23		174	9	53	38	
Other	46	9	59	33		45	7	53	40	
Clinical T stage:										
Tis/T1/T2	304	9	51	41	<0.001	304	5	49	46	<0.001
T3/T4	110	11	73	16		112	14	61	25	
Clinical N stage:										
N0	254	9	49	42	<0.001	256	8	48	44	0.07
N+	161	10	68	22		162	7	59	34	
Treatment:										
Operation only	175	7	45	49	<0.001	174	6	44	51	0.01
Operation with CT/RT	138	10	64	25		140	8	59	33	
CT/RT without operation	110	12	66	22		111	10	56	34	
Free-flap:										
No flap	239	8	50	42	0.05	239	5	46	49	<0.001
Soft flap	52	12	63	25		52	12	65	23	
Composite flap	17	6	76	18		18	22	61	17	
From survey:										
Age at leaving full-time education (years)										
16	265	9	60	31	0.11	266	6	57	37	0.01
17–18	52	8	60	33		53	6	53	42	
19–22	35	3	49	49		35	11	29	60	
Older than 22	40	10	40	50		40	13	33	55	
Age at survey (years):										
<55	46	11	52	37	0.92	47	15	40	45	0.24
55–64	142	10	56	34		143	8	52	39	
65–74	151	8	61	31		152	6	52	42	
75–79	50	10	48	42		49	8	51	41	
≥80	34	9	59	32		34	0	68	32	

Ever had radiotherapy as part of cancer treatment?										
Yes	284	10	65	25	<0.001	287	9	57	34	<0.001
No	125	6	40	54		124	5	40	56	
Ever had chemotherapy as part of cancer treatment?										
Yes	111	12	69	19	<0.001	112	12	57	31	0.02
No	297	8	52	40		298	6	50	44	
Do you have a feeding tube into your stomach at the moment?										
Yes	28	14	75	11	0.02	30	27	50	23	<0.001
No	383	9	55	36		383	6	52	42	
Conditions stated	201	14	60	26	<0.001	201	11	60	29	<0.001
None	221	5	54	41		223	4	45	51	
Heart related**	50	14	58	28	0.37*	50	10	54	36	0.69*
Lung related†	47	17	62	21	0.05*	47	6	74	19	0.004*
Joint related††	93	18	60	22	<0.001*	93	14	63	23	<0.001*

* Compared with condition not stated.

** Heart related: ischaemic heart disease, attack, blood pressure, atrial fibrillation, angina.

† Lung related: chronic obstructive pulmonary disease, asthma, shortness of breath.

†† Joint related: arthritis, hip/knee replacement, osteoporosis, mobility or balance issues.

Table 4
Intensity of leisure time exercise/week by response to items in the activity and recreation domains of the University of Washington quality of life (UW-QoL) questionnaire. Data are number (%).

	Activity				Recreation			
	Serious problem (%)	Somewhere between (%)	Best response (%)	Chi squared p value	Serious problem (%)	Somewhere between (%)	Best response (%)	Chi squared p value
No. of patients	36	233	141		31	212	169	
Intensity of leisure time exercise:								
Strenuous exercise of >15 minutes duration one or more times a week	3	14 (6)	33 (23)	<0.001	1	16 (8)	32 (19)	<0.001
No strenuous exercise but moderate exercise of >15 minutes duration one or more times a week	2	40 (17)	34 (24)		0	33 (16)	43 (25)	
No strenuous or moderate exercise but any mild exercise of >15 minutes duration one or more times a week	10	88 (38)	46 (33)		2	84 (40)	58 (34)	
None of the above	21	91 (39)	28 (20)		28	79 (37)	36 (21)	
Godin leisure-time scores of:								
0	21	91 (39)	28 (20)	<0.001	28	79 (37)	36 (21)	
1–9	5	39 (17)	17 (12)		0	37 (17)	24 (14)	
10–19	4	36 (15)	24 (17)		1	37 (17)	26 (16)	<0.001
20–29	1	38 (16)	38 (26)		1	34 (16)	41 (24)	
≥30	5	29 (12)	34 (24)		1	25 (12)	42 (24)	

Godin leisure-time exercise questionnaire definitions:

Strenuous exercise (heart beats rapidly): running, jogging, football, squash, roller skating, vigorous swimming, vigorous bicycling.

Moderate exercise (not exhausting): fast walking, tennis, easy bicycling, badminton, easy swimming, dancing.

Mild exercise (minimal effort): easy walking, yoga, fishing, bowling, golf.

Godin leisure-time score:

Weekly frequencies of strenuous, moderate, and mild activities are multiplied by 9, 5, and 3, respectively. Total weekly leisure activity is calculated in arbitrary units as: $(9 \times \text{strenuous}) + (5 \times \text{moderate}) + (3 \times \text{mild})$.

Table 5

Perceived barriers to exercise by responses to items in the activity and recreation domains of the University of Washington quality of life (UW-QoL) questionnaire. On a 1-5 scale, with 1 = never and 5 = very often, data are the percentage of patients who gave responses of 4 or 5.

Barrier	Activity				Recreation			
	Serious problem (26-34)*	Somewhere between (175-207)*	Best response (107-118)*	Chi squared p value	Serious problem (21-27)*	Somewhere between (158-190)*	Best response (130-144)*	Chi squared p value
1. Dry mouth or throat	68	46	21	<0.001	77	49	22	<0.001
2. Lack of interest	18	21	13	0.16	25	18	17	0.67
3. Fatigue	65	45	13	<0.001	81	45	18	<0.001
4. Exercise not a priority	24	24	12	0.04	45	22	13	0.001
5. Lack of enjoyment	16	25	14	0.09	35	21	18	0.19
6. Exercise not in routine	20	23	16	0.34	39	19	21	0.08
7. Procrastination	14	23	15	0.28	17	19	20	0.94
8. Drainage in mouth or throat	42	27	9	<0.001	61	28	10	<0.001
9. Lack of self-discipline	36	25	16	0.05	48	21	21	0.02
10. Difficulty eating	45	29	2	<0.001	65	30	4	<0.001
11. Pain	55	27	7	<0.001	65	30	7	<0.001
12. Lack of equipment	36	22	12	0.009	52	23	12	<0.001
13. Weather	28	26	11	0.004	36	26	12	0.001
14. Inconvenient exercise schedule	22	22	18	0.72	17	25	17	0.24
15. Shortness of breath	48	34	19	0.002	76	36	17	<0.001
16. Exercise is boring	25	18	16	0.57	29	16	20	0.24
17. Muscle weakness	56	34	7	<0.001	67	35	11	<0.001
18. Difficulty swallowing	38	34	8	<0.001	54	34	10	<0.001
19. Decreased food intake	45	23	4	<0.001	68	23	4	<0.001
20. Difficulty breathing	44	22	14	0.002	50	26	12	<0.001
21. Lack of time	14	19	21	0.67	14	18	21	0.65
22. Lack of facilities and/or space	32	24	14	0.05	35	24	16	0.08
23. Shoulder weakness and/or pain	40	32	5	<0.001	65	32	7	<0.001
24. Cough	29	16	7	0.003	29	19	5	<0.001
25. Difficulty communicating	19	12	5	0.04	36	10	7	<0.001
26. Lack of company	13	13	5	0.10	50	10	7	<0.001
27. Cost	23	21	11	0.07	45	19	11	<0.001
28. Family responsibilities	7	16	18	0.36	27	16	14	0.28
29. Fear of making condition worse	27	16	7	0.01	42	17	6	<0.001
30. Lack of knowledgeable exercise staff	32	23	9	0.003	52	20	11	<0.001
31. Fear of injury	33	13	5	<0.001	39	14	5	<0.001
32. Lack of skills	21	12	8	0.16	33	10	9	0.004
33. Nausea	27	9	7	0.005	33	9	7	0.001
34. Depression/anxiety	14	16	9	0.19	45	15	8	<0.001
35. Feeding tube	14	8	11	0.45	29	7	10	0.008
36. Difficulty drinking	22	12	9	0.14	40	11	7	<0.001
37. Lack of transport	29	14	10	0.03	50	15	8	<0.001

* depended on the response to the specific barrier. Note that the responses to procrastination are not included in the range and were 22, 150, & 104 for activity, and 18, 135, & 124 for recreation.

Table 6
Feeling able to participate in an exercise programme, by response to items on activity and recreation in the University of Washington quality of life (UWQoL) questionnaire.

	Activity				Recreation				Chi squared p value
	Serious problem (n = 37)	Somewhere between (n = 234)	Best response (n = 141)	Chi squared p value	Serious problem (n = 31)	Somewhere between (n = 213)	Best response (n = 170)	Chi squared p value	
Do you think you would be able to participate in an exercise programme for head and neck cancer patients?									
Yes	10 (27)	85 (36)	83 (59)	<0.001	7 (23)	81 (38)	90 (53)	0.001	
Maybe	17 (46)	85 (37)	27 (19)		10 (32)	80 (38)	41 (24)		
No	10 (27)	64 (27)	31 (22)		14 (45)	52 (24)	39 (23)		

ties breathing, and fear of injury and of making their condition worse. Other barriers such as difficulties in communicating, lack of company, cost, lack of transport, depression or anxiety, and having a feeding tube in place, were more prevalent the lower the level of recreation. Patients with low scores in both domains felt less able to participate in an exercise programme (Table 6).

Discussion

The adverse effects of the treatment of cancer of the head and neck on a patient's ability to function physically, socially, and emotionally, can influence levels of activity and recreation, and affect wellbeing and recovery. The activity and recreation domains are a mixture of the physical, social, and emotional subscales. This was indicated by a factor analysis involving all 12 domains of the UWQoLv4, which produced a two-factor solution that included activity, recreation, and shoulder function in the social-emotional (and not the physical) subscale.¹³

Our sample size of 1021 eligible patients was large but the response rate of 43% was slightly lower than that reported in previous surveys of this population. This might be because of the number of questionnaires patients were asked to complete, or just a lack of interest in the topic. The results might therefore under-estimate the sedentary lifestyle and barriers to exercise in this group. One such barrier might be fatigue, and future surveys could use the Modified Brief Fatigue Inventory (MBFI),¹⁴ to measure its intensity and frequency specifically in this group. Interestingly, predictors of increased MBFI scores have included the American Society of Anesthesiologists (comorbidity) grade, cancer stage, and adjuvant radiotherapy.¹⁴ The Patients Concerns Inventory¹⁵ has shown that fatigue is one of the issues patients most like to discuss during their consultations, and measures to alleviate it might benefit both activity and recreation. If our study had been clinic-based, the results could have been augmented with objective measures such as changes in cardiorespiratory fitness, strength of grip, muscle strength in the lower body, and the six-minute walking test.¹⁶

Relatively few patients had poor scores for both activity and recreation, though nearly one in five selected "activity" on the UW-QoL as one of the three most important items in the last week (Table 1). The two domains are interlinked but there is evidence to regard them as distinct (Table 2). The main clinical associations with activity were oropharyngeal cancer and advanced stage (Table 3), which were probably linked through radiotherapy and chemoradiotherapy. Concurrent chemoradiotherapy is associated with considerable reductions in weight, mobility, and QoL.¹⁷ Nutrition is an important component because malnourished patients who are treated for oral or oropharyngeal cancer score lower on QoL scales that relate to physical fitness,¹⁸ and the long-term effect of fatigue is well known.¹⁹ For recreation, the main associations were with advanced disease, free flap surgery,

radiotherapy, gastrostomy feeding tube, and coexisting conditions.

The impact of a gastrostomy tube on HRQoL has previously been reported.²⁰ More aggressive treatment is associated with worse shoulder function and QoL, and the degree of perceived impairment has a impact on leisure activities and employment.²¹ Interventions to reduce shoulder pain and improve strength and endurance in the upper extremity (such as progressive resistance exercise training)²² could help patients become more active.

The activity and recreation domains are clearly associated with the intensity of leisure-time activity (Table 4), and patients with serious problems were most likely to be sedentary. This survey, however, could not differentiate between those who were unable to exercise and those who lacked the opportunity or desire to do so.

Both domains were associated with perceived barriers to exercise (Table 5). Some, such as a dry mouth or throat, fatigue, pain, or lack of equipment, featured in both, but some were associated more with recreation, for example, difficulty communicating, lack of company, depression/anxiety, feeding tube, difficulty drinking, and lack of transport. Recognition of these barriers and the implementation of measures to mitigate them could improve uptake on exercise programmes and in turn improve recovery, HRQoL, and well-being. Scores for both domains also correlated with feeling able to participate in an exercise programme (Table 6).

Patients with high scores are more likely to want to participate in activities and should be encouraged to do so, but those with lower scores who are less enthusiastic, have a greater potential for benefit.⁵ Midgely et al² reported that the most common barriers to exercise were dry mouth or throat, fatigue, shortness of breath, muscle weakness, difficulty swallowing, shoulder weakness, and pain, and we need to adopt a customised approach to help patients overcome them. Two notable clinical factors that were related to feeling able to participate were age and lung-related conditions.

Few patients took moderate or vigorous exercise, and over half were completely sedentary.²³ Measures to reduce the amount of sedentary time could considerably improve physical functioning, general health, and HRQoL.^{24,25} Physical activity is beneficial both during and after treatment,²⁶ and exercise training improves functional capacity and QoL in patients being treated by chemoradiotherapy.²⁷ However, the delivery of such measures needs careful consideration, as people's preferences differ.¹¹ In spite of issues concerning occlusion of the tracheostomy tube, a number of highly motivated patients have taken up swimming again after laryngectomy, and reported that it improved their QoL.²⁸ A 14-week functional resistance and walking programme that is designed to maintain physical activity during treatment can attenuate these functional losses and considerably benefit mental health.²⁹ Exercise also increases cardiorespiratory fitness and reduces fatigue.³⁰ Levels of activity might reflect the ability to work, which can be a sign of a complete recovery and return to normal life.³¹

In conclusion, the use of the UW-QoL activity and recreation domains soon after treatment will identify patients who would and would not find it easy to join an exercise programme. Exercise, however, has to be realistic and suitable for each person, but it has the potential to improve overall QoL.

Conflict of interest

We have no conflicts of interest.

Ethics statement/confirmation of patient's permission

The study received favourable opinion from the Cambridge South NHS Research Ethics Committee (Ref. 15/EE/0429). The data, which had been collected as part of a service audit rather than for research, met the criteria of the local Clinical Governance Department for service evaluation. Patients' permission was not required.

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