

Lincolnshire Exercise Referral Evaluation Research

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On behalf of:



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1. Exercise Referral Evaluation Research

1.1. Evaluation Overview and Methods

The following evaluation research examined the data for patients who were referred by health professionals for supervised exercise.

The purpose was to examine data for patients attending Lincolnshire's Exercise Referral (ER) Programme over a 12 month period.

The analysis was in response to questions that had been identified by Lincolnshire Sport and Public Health Lincolnshire. This was to examine any changes in the New Zealand Physical Activity Questionnaire (NZPAQ) and the EQ-5D-3L (health related quality of life measure) scores in relation to the following:

- Gender.
- Reason for referral.
- Body Mass Index (BMI).
- Postcode (area of deprivation).

Relevant data were accessed via Lincolnshire Sport's parachute system and were analysed via the calculation of statistics (i.e. percentages; means \pm standard deviations; binary logistic regression).

The data spanned a period of 12 months and included patients in the database who started a 12-week ER programme between September through to November 2013, and attended the first (week 1), second (week 12) and none or more of the following two visits (6 and 12 months).

There were 935 eligible patients with 776 (82.9%) patients completing week 1 of the NZPAQ (61.8% female and 38.2% male) and 780 (83.4%) completing week 1 of the EQ-5D-3L (62% female and 38% male). The number of completions varied across each question for both surveys, and all responses that were provided have been analysed.

2. Key Findings

2.1. General Responses

It was of interest to provide an overall analysis of the number of responses to both questionnaires and the general patterns that had been observed in the data.

In review of the NZPAQ, the number of patients' recorded data varied considerably between each question and the different time points (as shown in table 2.1a below). The questionnaire has three types of questions: 0-7 day response (questions 1, 3, 5 and 7); open question on how much time spent performing physical activity (questions 2, 4 and 6), and; 5-option closed question (question 8). The open questions on time spent active resulted in fewer answers entered into the database, partly as directed by the NZPAQ to skip these questions. The number of responses decreased over the 12 months as fewer people attended however there was a proportionally higher completion rate noted for questions 2, 4 and 6. This is encouraging as these questions were only completed if the patient had answered the previous questions (i.e. 1, 3 and 5) with a value greater than 0, identifying on how many days they had been active.

Table 2.1a Number of patients completing NZPAQ

Question	Week 1	Week 12	6 months	12 months
1 (brisk walk: 0-7 days)	776	679	214	59
2 (brisk walk: mins)	401	550	185	47
3 (moderate activity: 0-7 days)	780	678	214	59
4 (moderate activity: mins)	315	606	181	44
5 (vigorous activity: 0-7 days)	775	666	208	58
6 (vigorous activity: mins)	121	241	76	19
7 (frequency all activity: 0-7 days)	773	670	210	57
8 (state of change: 1-5 score)	785	681	215	59

Overall the data showed an increase in the mean scores for each question between week 1 and 12 months (table 2.1b). This would suggest that patients were increasing the days and time spent active. These values were found to be significant for question 1 generally improving over time, and

for question 5 initially improving at week 12 but then reducing at 6 and 12 months (see appendix 1 table 1a for P values). For questions 2 and 4 there were no or few significant differences over time (see appendix 1 table 1a for P values). Of the eight questions only two continued to increase through the time points, questions 1 and 8. This indicated that the number of days spent briskly walking had continued to increase over a period of 12 months and how the patient classified their regular physical activity levels had increased.

Table 2.1b NZPAQ mean scores

Question	Week 1	Week 12	6 months	12 months
1 (brisk walk: 0-7 days)	1.85	2.90	3.15	3.37
2 (brisk walk: mins)	43.27	41.03	43.96	48.23
3 (moderate activity: 0-7 days)	1.23	2.95	2.80	2.14
4 (moderate activity: mins)	63.01	52.88	50.88	68.82
5 (vigorous activity: 0-7 days)	0.31	1.37	0.87	0.71
6 (vigorous activity: mins)	39.18	39.49	31.88	54.58
7 (frequency all activity: 0-7 days)	2.18	4.35	4.68	4.07
8 (state of change: 1-5 score)	2.68	3.67	3.70	4.00

(higher scores better; see appendix 1 table 1a for P values)

In review of the EQ-5D-3L the number of patients responding showed only minor variation between each question but larger changes between time points. As with the NZPAQ however it was unclear as to why there was any variation in the number of patients completing each of the 6 questions at each time point (as shown in table 2.1c below).

The number of patients completing the questionnaire declined for all questions over the 12 month period. It was noted however that 781 patients completed question 6 in week 1 in comparison to slightly lower numbers being recorded for the remaining five questions. As previously stated it is unclear as to why this is the case other than patients did not fully complete the questionnaire or imputing errors into the parachute system.

Table 2.1c Number of patients completing EQ-5D-3L

Question	Week 1	Week 12	6 months	12 months
1 (mobility)	780	677	215	59
2 (selfcare)	778	675	215	59
3 (activity)	777	673	215	59
4 (pain/ discomfort)	774	677	214	57
5 (anxiety/ depression)	777	676	215	59
6 (health/ status)	781	679	215	59

The mean data showed a number of changes for each question between week 1 and 12 months (table 2.1d). Only questions 2 and 6 presented a higher mean at 12 months than what was originally recorded at week 1. Question 2 represented patients' perspectives on their self-care so an increase in this figure would have been seen as a decline in their ability to care for themselves, however this increase was found not to be significant (see appendix 1 table 1b for P values). Question 6 asked patients to reflect on their state of health. An increase in this figure was positive, indicating that patients felt that their state of health had improved. This increase between week 1 and, week 12, 6 months and 12 months were all found to be significant (see appendix 1 table 1b for P values).

For the remaining questions (1, 3, 4 and 5) all of the 12 month values were found to be statistically lower than those means calculated at week 1. These decreases can all be viewed as positive as these would indicate improvements in how patients viewed their ease of mobility, problems experienced with usual activities, pain and feelings of anxiety. None of these decreases between week 1 and 12 months however were found to be significant (see appendix 1 table 1b for P values).

As with the NZPAQ data, changes in means throughout the time points were observed with questions 1 and 4 (Mobility and Pain) showing the greatest variation. Questions 2, 3, 5 and 6 were more consistent with changes in means, either progressively increasing or decreasing, as previously highlighted.

Table 2.1d EQ-5D-3L mean scores

Question	Week 1	Week 12	6 months	12 months
1 (mobility)	1.31	1.26	1.32	1.27

2 (selfcare)	1.06	1.07	1.07	1.08
3 (activity)	1.37	1.28	1.27	1.25
4 (pain/ discomfort)	1.59	1.49	1.48	1.51
5 (anxiety/ depression)	1.35	1.29	1.26	1.20
6 (health/ status)	53.62	65.23	67.93	71.85

(1-5 lower scores better; 6 higher score better; see appendix 1 table 1b for P values)

2.2. Gender

When comparing NZPAQ data for males and females the changes in means presented similar patterns to those shown in the overall data. For all the duration questions (questions 2, 4 and 6) for both sexes' scores there were none or few statistical differences between time points (see appendix 2 table 2a for P values). Nevertheless, there was a general trend for the duration of physical activity to increase over time for both sexes.

Table 2.2a Female mean scores for NZPAQ

Question	Week 1	Week 12	6 months	12 months
1 (brisk walk: 0-7 days)	1.86	2.92	3.05	3.55
2 (brisk walk: mins)	41.65	39.55	42.88	49.26
3 (moderate activity: 0-7 days)	1.12	2.69	2.67	2.03
4 (moderate activity: mins)	56.50	50.78	45.60	72.92
5 (vigorous activity: 0-7 days)	0.24	1.36	0.76	0.48
6 (vigorous activity: mins)	31.16	36.73	34.92	42.70
7 (frequency all activity: 0-7 days)	2.07	4.30	4.73	4.94
8 (state of change: 1-5 score)	2.63	3.61	3.56	4.09

(higher scores better; see appendix 2 table 2a for P values)

Question 4 required patients to reflect on time spent moderately active. For both sexes, each question's mean across the time points followed similar patterns, however women presented a higher mean at 12 months in comparison to week 1, with men's scores lower at 12 months. Changes though were not significant (see appendix 2 table 2a and 2b for P values).

Changes in days active (questions 1, 3, 5 and 7) for both sexes generally showed significant increases in comparison to week 1 over time. Although there was some fluctuation in activity days from 12 weeks through 6 and 12 months, these changes for both sexes were generally not significant.

Table 2.2b Male mean scores for NZPAQ

Question	Week 1	Week 12	6 months	12 months
1 (brisk walk: 0-7 days)	1.85	2.87	3.30	3.15
2 (brisk walk: mins)	45.83	43.55	45.58	46.85
3 (moderate activity: 0-7 days)	1.42	3.37	3.01	2.27
4 (moderate activity: mins)	73.05	56.27	59.24	63.42
5 (vigorous activity: 0-7 days)	0.42	1.38	1.04	1.00
6 (vigorous activity: mins)	49.13	43.72	28.68	67.78
7 (frequency all activity: 0-7 days)	2.37	4.44	4.59	2.96
8 (state of change: 1-5 score)	2.75	3.75	3.91	3.88

(higher scores better; see appendix 2 table 2b for P values)

Completion of the EQ-5D-3L also generated a range of responses when comparing males and females. For all but one question (question 2) the comparison of the mean between week 1 and 12 months generated the same outcomes. There were few changes from week 1 to 12 months, except for question 1 for males that significantly increased/worsened (mobility) and question 6 for females that significantly increased/improved (state of health). In addition, for question 5 (anxiety) the 12 month mean was significantly lower than that recorded at week 1 for females, but not for males (see appendix 2 table 2c and 2d for P values).

Table 2.2c Male mean scores for EQ-5D-3L

Question	Week 1	Week 12	6 months	12 months
1 (mobility)	1.30	1.24	1.27	1.19
2 (selfcare)	1.07	1.07	1.07	1.12
3 (activity)	1.35	1.28	1.23	1.23
4 (pain/ discomfort)	1.52	1.41	1.39	1.38
5 (anxiety/ depression)	1.31	1.27	1.29	1.15
6 (health/ status)	54.71	66.21	68.65	71.73

(1-5 lower scores better; 6 higher score better; see appendix 2 table 2c for P values)

For question 1 (mobility) the male mean was significantly lower at 12 months in comparison to week 1, whereas the female there was no significant difference (see appendix 2 table 2c and 2d for P values).

Differences were also observed between the other data collection points (12 weeks and 6 months). Of each of the questions, only question 6 which required patients to reflect on the state of their health, exhibited a consistent increase in mean throughout the data collection points for both males (significant for 1-12 week and 1 week – 6 months) and females (significant for 1-12 weeks, 1 week – 6 months, 1 week – 12 months) (see appendix 2 table 2c and 2d for P values).

Table 2.2d Female mean scores for EQ-5D-3L

Question	Week 1	Week 12	6 months	12 months
1 (mobility)	1.31	1.27	1.35	1.33
2 (selfcare)	1.05	1.06	1.07	1.06
3 (activity)	1.38	1.29	1.29	1.27
4 (pain/ discomfort)	1.63	1.54	1.53	1.61

5 (anxiety/ depression)	1.37	1.30	1.24	1.24
6 (health/ status)	52.95	64.62	67.49	71.94

(1-5 lower scores better; 6 higher score better; see appendix 2 table 2d for P values)

2.3. Reason for Referral

It was interesting to observe whether the reason a patient was referred related to the results of the two questionnaires. For those patients referred for obesity (approximately 50% of respondents) only two questions were significantly different at 12 months in comparison to week 1 values: question 1 and 8, both of which increased (improved). For question 4 the mean was 15.8 lower, but this was not significantly proved.

Other reasons for referral (e.g. musculoskeletal, mental health, pulmonary condition) generally showed significant improvements for days active (i.e. questions 1, 3, 5 and 7) but no significant difference for time active (i.e. questions 2, 4 and 6) (see appendix 3 table 3a and 3b for P values).

Table 2.3a Patients referred for obesity mean NZPAQ scores

Question	Week 1	Week 12	6 months	12 months
1 (brisk walk: 0-7 days)	1.76	2.80	3.00	2.91
2 (brisk walk: mins)	40.71	39.33	42.55	44.58
3 (moderate activity: 0-7 days)	1.14	2.89	2.77	1.61
4 (moderate activity: mins)	68.27	53.18	47.54	52.47
5 (vigorous activity: 0-7 days)	0.32	1.58	0.98	0.61
6 (vigorous activity: mins)	38.72	43.03	29.76	52.50
7 (frequency all activity: 0-7 days)	2.06	3.84	4.05	2.48
8 (state of change: 1-5 score)	2.56	3.59	3.49	3.74

(higher scores better; see appendix 3 table 3a for P values)

What was interesting to note was the changes observed between 6 and 12 months. For those patients referred for obesity, questions 1, 3, 5 and 7 the mean decreased at 12 months in comparison to 6 months. In contrast, for questions 2, 4, 6 and 8 the means all increased over the same period of time. This suggested that although the number of days spent active had decreased, the time spent active had increased and their state of change had improved. These changes were all however not significant. For those referred for other reasons the data indicated similar patterns, and although not significant for days active (i.e. questions 3, 5 and 7) the improvement was significantly better for duration of activity (i.e. questions 4 and 6 between 12 weeks and 12 months) (see appendix 3 table 3a and 3b for P values).

Table 2.3b Patients referred for other reasons mean NZPAQ scores

Question	Week 1	Week 12	6 months	12 months
1 (brisk walk: 0-7 days)	1.96	3.01	3.34	3.67
2 (brisk walk: mins)	45.79	42.67	45.65	50.71
3 (moderate activity: 0-7 days)	1.33	3.01	2.85	2.47
4 (moderate activity: mins)	58.35	52.57	55.09	79.11
5 (vigorous activity: 0-7 days)	0.29	1.15	0.71	0.77
6 (vigorous activity: mins)	39.70	35.47	35.13	56.09
7 (frequency all activity: 0-7 days)	2.32	4.87	5.49	5.15
8 (state of change: 1-5 score)	2.80	3.75	3.97	4.17

(higher scores better; see appendix 3 table 3b for P values)

When comparing the reasons for referral against results of the EQ-5D-3L, for those patients referred for obesity only question 4 (pain/discomfort) significantly improved from week 1 to 12 weeks, and question 6 (health status) improved from week 1 to 12 weeks, 6 months and 12 months. Similar to other variables, after 12 weeks there were no significant changes.

Table 2.3c EQ-5D-3L mean scores for patients referred for obesity

Question	Week 1	Week 12	6 months	12 months
1 (mobility)	1.30	1.26	1.36	1.39

2 (selfcare)	1.07	1.06	1.09	1.13
3 (activity)	1.32	1.26	1.25	1.30
4 (pain/ discomfort)	1.56	1.45	1.51	1.68
5 (anxiety/ depression)	1.32	1.26	1.29	1.30
6 (health/ status)	53.03	64.60	66.22	71.78

(1-5 lower scores better; 6 higher score better; see appendix 3 table 3c for P values)

For those referred for other reasons the mean scores differed in comparison, specifically questions 3, 4, 5 and 6 which all significantly improved from week 1 to 12 months. This indicated improvements in usual activity, pain, anxiety and health status (see appendix 3 table 3d for P values). For anxiety and health status there were also continued significant improvements from week 12 to 12 months.

Table 2.3d EQ-5D-3L mean scores for patients referred for other reasons

Question	Week 1	Week 12	6 months	12 months
1 (mobility)	1.32	1.26	1.27	1.19
2 (selfcare)	1.05	1.07	1.04	1.06
3 (activity)	1.42	1.30	1.28	1.22
4 (pain/ discomfort)	1.61	1.54	1.43	1.40
5 (anxiety/ depression)	1.37	1.31	1.23	1.14
6 (health/ status)	54.23	65.86	70.17	71.89

(1-5 lower scores better; 6 higher score better; see appendix 3 table 3d for P values)

2.4. BMI

It was useful to examine both questionnaire responses in relation to a patient's BMI score. Through appropriate analysis (binary logistic regression) it would be possible to determine if one particular variable was significant in predicting a change in patient's BMI. NZPAQ days active questions (i.e. 1, 3, 5, 7 and 8; as they had higher response rates) and all EQ-5D-3L questions, using only the week 1 responses that had the largest sample size.

Following analysis it was identified that anxiety (EQ-5d-3L question 5) was the only variable that was significant in predicting BMI change of $>.33\text{kg/m}^2$ ($.33\text{kg/m}^2$ was the approximate median BMI change from the data). This was most apparent for those with low levels of anxiety, where an odds score above 1 indicated the change was more likely to happen (as shown in table 2.4a). This highlights that for those patients demonstrating lower levels of anxiety they would be more likely to change and improve their BMI.

Table 2.4a Odds of anxiety predicting BMI change

Variable	Odds	Significance (p)
Low Anxiety	1.33	0.004
Medium Anxiety	0.77	0.002
High Anxiety	0.27	0.005

2.5. Deprivation

For the NZPAQ, there was little consistency in patterns between improvements or worsening scores in comparing high and low deprivation scores. Similarly, there was little consistency in the pattern of statistical differences across the 8 questions between the high and low deprivation (see Table 2.5a).

Table 2.5a NZPAQ scores mean difference between high (6-10) minus low (1-5) deprivation scores (negative are low deprivation scores are less; positive are high deprivation scores are greater)

Question	Week 1	Week 12	6 months	12 months	Better for high group	Better for low group
1 (days)	0.28	0.30	0.65	1.02	High (+)	Low (-)
2 (mins)	-3.06	-6.35	6.75	23.62	High (+)	Low (-)

3 (days)	0.00	-0.34	0.00	0.98	High (+)	Low (-)
4 (mins)	-3.93	12.75	9.06	19.19	High (+)	Low (-)
5 (days)	-0.17	-1.10	-0.23	0.04	High (+)	Low (-)
6 (mins)	-7.27	1.25	12.71	12.43	High (+)	Low (-)
7 (days)	0.39	-0.24	-0.47	0.87	High (+)	Low (-)
8 (1-5)	-0.01	0.05	0.45	1.02	High (+)	Low (-)

(better scores indicated in right hand columns; see appendix 3 table 4a for P values)

In contrast, for the EQ-5D-3L, there was high consistency in results between high and low deprivation scores. For all 6 questions at all time points the high deprivation score (i.e. least deprived) revealed better scores than the low deprivation score (indicated by negative numbers for questions 1-5 and positive values for question 6; table 2.5b). This was significant at several time points, with anxiety being statistically significant between the majority of time points.

Table 2.5b EQ-5D-3L scores mean difference between high (6-10) minus low (1-5) deprivation scores (negative are low deprivation scores are less; positive are high deprivation scores are greater)

Question	Week 1	Week 12	6 months	12 months	Better for high group	Better for low group
1 (mobility)	-0.06	-0.10	-0.21	-0.30	Low (-)	High (+)
2 (selfcare)	-0.02	-0.02	-0.03	-0.09	Low (-)	High (+)
3 (activity)	-0.09	-0.10	-0.08	-0.20	Low (-)	High (+)
4 (pain/ discomfort)	-0.04	-0.09	-0.29	-0.44	Low (-)	High (+)
5 (anxiety/ depression)	-0.16	-0.10	-0.14	-0.24	Low (-)	High (+)
6 (health/ status)	4.31	3.99	1.20	6.97	High (+)	Low (-)

(better scores indicated in right hand columns; see appendix 4 table 4b for P values)

3. Summary

The purpose of this evaluation was to examine the data compiled by Lincolnshire's ER programmes in relation to clearly defined questions about NZPAQ and EQ-5D-3L changes. The primary findings in relation to each question can be summarised as the following:

- NZPAQ mean scores for days active, but not activity duration, were generally significantly improved at 12 weeks, 6 months and 12 months in comparison to week 1 for both males and females.
- EQ-5D-3L also showed improved scores for most questions at week 12 for both males and females, but fewer improved scores at 6 months and 12 months. Females showed greater improvements than males.
- NZPAQ mean scores for those patients referred for obesity significantly increased from week 1 to 12 weeks and 6 months, but fewer improvements to 12 months (only question 1 and 8). Patients referred for other reasons (i.e. non-obesity) showed greater improvements at 12 months, particularly in the number of days active.
- EQ-5D-3L mean scores for those patients referred for obesity showed some improvement in health status (question 6), but most other variables showed no change. In contrast, patients referred for other reasons showed greater improvements that lasted up to 12 months, and included improvements from 12 weeks to 6 and 12 months particularly for health status.
- Anxiety (EQ-5d-3L question 5), and no other EQ-5d-3L or NZPAQ questions, was the only variable to significantly contribute to predicting the likelihood of BMI changing by $>.33\text{kg/m}^2$ (approximately the median BMI change from week 1 to week 12). Those with low levels of anxiety had the highest likelihood of improving their BMI.
- Deprivation was poorly distinguished by the NZPAQ, whereas the EQ-5D-3L had high consistency in distinguishing between high and low deprivation scores. For all 6 questions at all time points the high deprivation score (i.e. least deprived) revealed better EQ-5D-3L scores than the low deprivation score.

4. Appendices

Appendix 1

Table 1a NZPAQ mean score P values (shaded indicates significant)

Question	1-12 weeks	1 week – 6 months	1 week – 12 months	12 weeks – 6 months	12 weeks – 12 months	6 months – 12 months
1 (days)	0.000	0.000	0.000	0.448	0.000	0.000
2 (mins)	0.109	0.525	0.425	0.285	0.933	0.577
3 (days)	0.000	0.000	0.000	0.060	0.630	0.814
4 (mins)	0.305	0.512	0.908	0.024	0.493	0.216
5 (days)	0.000	0.000	0.003	0.024	0.000	0.000
6 (mins)	0.003	0.002	0.477	0.024	0.547	0.793
7 (days)	0.000	0.000	0.013	0.749	0.459	0.435
8 (1-5)	0.000	0.000	0.000	0.816	0.175	0.035

Table 1b EQ-5D-3L mean scores P values (shaded indicates significant)

Question	1-12 weeks	1 week – 6 months	1 week – 12 months	12 weeks – 6 months	12 weeks – 12 months	6 months – 12 months
1 (mobility)	0.000	0.183	0.167	0.103	1.000	1.000
2 (selfcare)	0.842	1.000	0.182	0.706	1.000	1.000
3 (activity)	0.000	0.000	0.109	0.848	0.568	0.660
4 (pain/ discomfort)	0.000	0.002	0.103	0.790	0.289	1.000
5 (anxiety/ depression)	0.001	0.158	0.135	0.613	0.182	0.743
6 (health/ status)	0.000	0.000	0.001	0.719	0.750	0.226

Appendix 2

Table 2a Female mean score P values for NZPAQ (shaded indicates significant)

Question	1-12 weeks	1 week – 6 months	1 week – 12 months	12 weeks – 6 months	12 weeks – 12 months	6 months – 12 months
1 (days)	0.000	0.000	0.012	0.416	0.126	0.469
2 (mins)	0.195	0.786	0.776	0.858	0.966	0.450
3 (days)	0.000	0.000	0.008	0.203	0.366	0.256
4 (mins)	0.306	0.942	0.353	0.013	0.647	0.538
5 (days)	0.020	0.000	0.025	0.158	0.301	0.450
6 (mins)	0.801	0.561	1.000	0.796	0.226	0.374
7 (days)	0.000	0.000	0.029	0.375	0.201	0.822
8 (1-5)	0.000	0.000	0.000	0.365	0.051	0.090

Table 2.b Male mean score P values for NZPAQ (shaded indicates significant)

Question	1-12 weeks	1 week – 6 months	1 week – 12 months	12 weeks – 6 months	12 weeks – 12 months	6 months – 12 months
1 (days)	0.000	0.000	0.110	0.853	0.484	1.000
2 (mins)	0.347	0.568	0.160	0.139	0.813	0.576
3 (days)	0.000	0.000	0.001	0.167	0.796	0.207
4 (mins)	0.662	0.462	0.437	0.947	0.589	0.065
5 (days)	0.005	0.001	0.039	0.180	0.479	0.767
6 (mins)	0.965	0.565	0.529	0.426	0.031	0.136
7 (days)	0.000	0.000	0.198	0.631	0.090	0.269
8 (1-5)	0.000	0.000	0.002	0.465	0.907	0.205

Table 2c Male mean score P values for EQ-5D-3L (shaded indicates significant)

Question	1-12 weeks	1 week – 6 months	1 week – 12 months	12 weeks – 6 months	12 weeks – 12 months	6 months – 12 months
1 (mobility)	0.002	0.134	0.043	0.288	0.713	0.331
2 (selfcare)	0.764	1.000	0.327	0.657	0.327	0.331
3 (activity)	0.000	0.010	0.185	0.442	0.327	1.000
4 (pain/ discomfort)	0.000	0.114	0.327	1.000	1.000	1.000
5 (anxiety/ depression)	0.251	0.374	0.574	0.251	0.490	0.429
6 (health/ status)	0.000	0.000	0.130	0.482	0.760	0.314

Table 2d Female mean score P values for EQ-5D-3L (shaded indicates significant)

Question	1-12 weeks	1 week – 6 months	1 week – 12 months	12 weeks – 6 months	12 weeks – 12 months	6 months – 12 months
1 (mobility)	0.001	0.656	0.744	0.207	0.712	0.327
2 (selfcare)	1.000	1.000	0.325	1.000	0.325	0.327
3 (activity)	0.000	0.002	0.292	0.566	1.000	0.664
4 (pain/ discomfort)	0.000	0.005	0.202	0.740	0.161	1.000
5 (anxiety/ depression)	0.002	0.010	0.169	0.145	0.254	0.574
6 (health/ status)	0.000	0.000	0.003	0.931	0.409	0.504

Appendix 3

Table 3a Patients referred for obesity mean NZPAQ P values (shaded indicates significant)

Question	1-12 weeks	1 week – 6 months	1 week – 12 months	12 weeks – 6 months	12 weeks – 12 months	6 months – 12 months
1 (days)	0.000	0.000	0.017	0.379	0.812	0.864
2 (mins)	0.722	0.734	0.739	0.446	0.554	0.840
3 (days)	0.000	0.000	0.250	0.806	0.228	0.013
4 (mins)	0.091	0.049	0.518	0.515	0.972	0.667
5 (days)	0.018	0.000	0.235	0.541	0.658	0.332
6 (mins)	0.614	0.400	0.567	0.104	0.609	0.130
7 (days)	0.000	0.000	0.492	0.626	0.108	0.087
8 (1-5)	0.000	0.000	0.000	0.319	0.397	0.379

Table 3b Patients referred for other reasons mean NZPAQ P values (shaded indicates significant)

Question	1-12 weeks	1 week – 6 months	1 week – 12 months	12 weeks – 6 months	12 weeks – 12 months	6 months – 12 months
1 (days)	0.000	0.000	0.000	0.176	0.086	0.478
2 (mins)	0.482	0.984	0.626	0.591	0.360	0.577
3 (days)	0.000	0.000	0.001	0.728	0.472	0.344
4 (mins)	0.367	0.723	0.173	0.740	0.036	0.062
5 (days)	0.002	0.001	0.009	0.441	0.677	0.844
6 (mins)	0.499	0.692	0.377	0.955	0.027	0.182
7 (days)	0.000	0.000	0.000	0.370	0.787	0.810
8 (1-5)	0.000	0.000	0.000	0.037	0.006	0.353

Table 3c EQ-5D-3L mean score P values for patients referred for obesity (shaded indicates significant)

Question	1-12 weeks	1 week – 6 months	1 week – 12 months	12 weeks – 6 months	12 weeks – 12 months	6 months – 12 months
1 (mobility)	0.308	0.269	0.408	0.074	0.234	0.819
2 (selfcare)	0.760	0.449	0.306	0.338	0.258	0.604
3 (activity)	0.108	0.198	0.873	0.867	0.689	0.651
4 (pain/ discomfort)	0.008	0.411	0.382	0.320	0.062	0.271
5 (anxiety/ depression)	0.113	0.494	0.866	0.666	0.708	0.884
6 (health/ status)	0.000	0.000	0.000	0.354	0.050	0.135

Table 3d EQ-5D-3L mean score P values for patients referred for other reasons (shaded indicates significant)

Question	1-12 weeks	1 week – 6 months	1 week – 12 months	12 weeks – 6 months	12 weeks – 12 months	6 months – 12 months
1 (mobility)	0.079	0.392	0.141	0.800	0.437	0.421
2 (selfcare)	0.291	0.792	0.882	0.391	0.770	0.796
3 (activity)	0.003	0.030	0.040	0.684	0.330	0.542
4 (pain/ discomfort)	0.081	0.009	0.037	0.124	0.162	0.754
5 (anxiety/ depression)	0.105	0.016	0.012	0.137	0.042	0.295
6 (health/ status)	0.000	0.000	0.000	0.020	0.031	0.595

Appendix 4

Table 4a Deprivation low v high mean score NZPAQ P values (shaded indicates significant)

Question	1-12 weeks	1 week – 6 months	1 week – 12 months	12 weeks – 6 months	12 weeks – 12 months	6 months – 12 months
1 (days)	0.1148	0.0791	0.0426	0.1495	0.1148	0.0791
2 (mins)	0.5576	0.0855	0.2875	0.0622	0.5576	0.0855
3 (days)	0.9886	0.3855	0.9903	0.0452	0.9886	0.3855
4 (mins)	0.7021	0.0444	0.2294	0.3175	0.7021	0.0444
5 (days)	0.0279	0.1099	0.3430	0.9147	0.0279	0.1099
6 (mins)	0.5464	0.8242	0.1777	0.6318	0.5464	0.8242
7 (days)	0.0587	0.5403	0.5911	0.5964	0.0587	0.5403
8 (1-5)	0.8542	0.4210	0.0090	0.0017	0.8542	0.4210

Table 4b Deprivation low v high mean score EQ-5D-3L P values (shaded indicates significant)

Question	1-12 weeks	1 week – 6 months	1 week – 12 months	12 weeks – 6 months	12 weeks – 12 months	6 months – 12 months
1 (mobility)	0.081	0.007	0.010	0.028	0.081	0.007
2 (selfcare)	0.283	0.412	0.472	0.322	0.283	0.412
3 (activity)	0.029	0.009	0.252	0.117	0.029	0.009
4 (pain/ discomfort)	0.420	0.051	0.003	0.005	0.420	0.051
5 (anxiety/ depression)	0.000	0.010	0.045	0.058	0.000	0.010
6 (health/ status)	0.004	0.003	0.614	0.144	0.004	0.003