

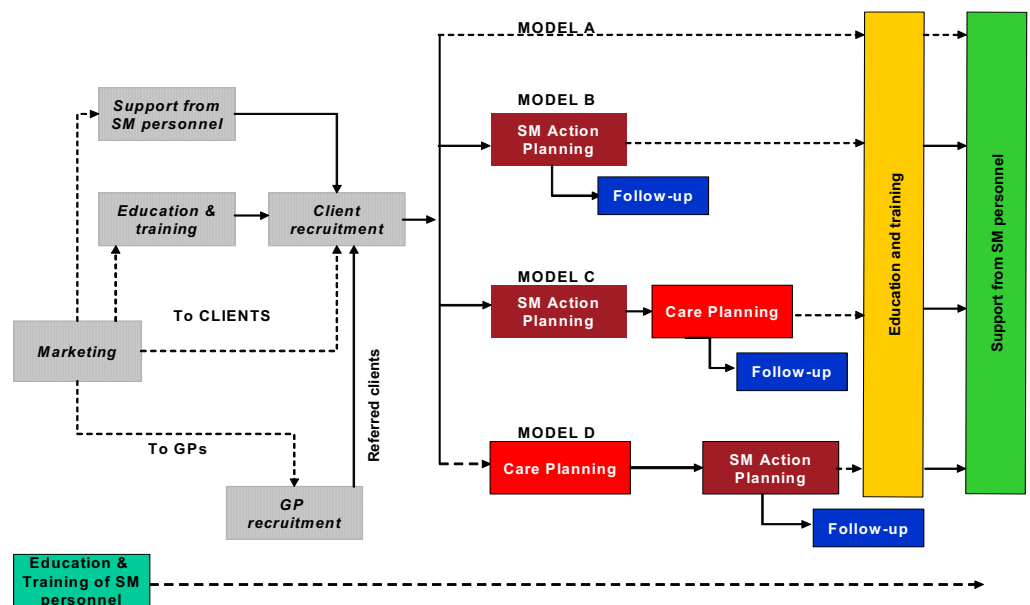
## 4.5 Influences on impact and outcome

As well as baseline self reported health status, there are a number of other factors which could influence health change, in particular, the intervention received, socio-economic status and reported chronics condition(s).

### 4.5.1 Models of service delivery re-visited

As part of the process mapping, four Process Models (A, B, C and D) were identified based upon the processes undertaken by the DPs, as shown in the figure below, which sets out the client overview process map for the last data measurement point.

Figure 26 Client domain: 'Last' overview process map



As discussed in Section 4.3.1, a considerable degree of variation was observed in terms of the interventions received by clients *within* the identified Process Models and within DPs. So for analysing SHCI outcomes, the Process Models were reclassified in terms of Intervention i.e. the participants were grouped by intervention received, as identified by the Intervention Schedule, as follows:

- Planning;
- Training; and
- Support.

The following table describes the range of activity which was included in these broad process categories.

**Table 62 Intervention descriptions**

<b>Intervention</b>	<b>Description</b>
<b>Planning</b>	Included both self-management action planning and care planning. The role of both care and self-management planning ranged from being an intervention which all clients received; to one of a suite of interventions (i.e. clients may not necessarily receive a care and/or self-management plan). See Table 29.
<b>Training</b>	The type of education and training offered to clients ranged from the standard Stanford course only, to a range of disease specific and 'other' non standard courses (for example, Tai Chi). See Table 29.
<b>Support</b>	The nature of support varied from being regular and structured and offered to all clients to being provided on an ad hoc basis. Support could be initiated by the DP and/or the clients. Support availability ranged from having defined limits formally placed on it, to being unlimited where contact occurred at non-prescribed times. See Table 29.

Four Intervention Models (named '1', '2', '3' and '4') emerged. The level of participation in certain interventions was very consistent for specific DPs and so the Intervention Models were organised by DP. A comparison of the Intervention Models with the Process Models identified in Section 4.3.1 is shown in Table 63 below.

**Table 63 Comparison of Intervention Models with Process Models**

<b>Intervention Model</b>	<b>Process Model</b>
Intervention Model 1 =	Process Model A
Intervention Model 2 =	Combination of Process Model B and Process Model C DPs
Intervention Model 3 =	Combination of Process Model B and Process Model C DPs
Intervention Model 4 =	Process Model D

Table 64 shows the key characteristics of each Intervention Model in terms of:

- Intervention Model type i.e. predominant characteristic;
- Extent of participation in an intervention by clients in the Intervention Model;
- Demographic characteristics of the participants in each Intervention Model; and
- Description of the key process variations and similarities within each Intervention Model.

**Table 64 Intervention Model summary**

Intervention Model	Intervention participation	Demographic profile <sup>6</sup>	Key Variations in Process between the DPs	Key Similarities in process between the DPs
<b>Intervention Model 1</b> <ul style="list-style-type: none"> <li>• 'Predominantly Stanford'</li> </ul>	<ul style="list-style-type: none"> <li>• No planning</li> <li>• Training: 94% (69% Stanford)</li> <li>• No support</li> </ul>	<ul style="list-style-type: none"> <li>• More arthritis</li> <li>• More females</li> <li>• Broad age range, towards the younger</li> </ul>	<b>Education and training of clients: determinants of client training</b> The role/importance of education and training of clients varied between DPs. At one end of the spectrum the education and training of clients was a fundamental, intrinsic and standardised activity which <i>all</i> clients received. At the other end, the education and training of clients was based upon client need with a range of training and education options made available to clients.	<b>Education and training of clients: driver</b> Both DPs predominantly drove the content, timing and administration of the education and training provided to the clients, with some input from the community provided.
<b>Intervention Model 2</b> <ul style="list-style-type: none"> <li>• 'Complete suite of interventions'</li> <li>• High participation rate</li> </ul>	<ul style="list-style-type: none"> <li>• Planning: 98%</li> <li>• Training: 94% (60% Stanford)</li> <li>• Support: 95%</li> </ul>	<ul style="list-style-type: none"> <li>• Older age group</li> <li>• More females</li> <li>• More CALD</li> <li>• More with no qualifications</li> <li>• More in supported accommodation</li> <li>• More with a carer</li> </ul>	<b>Care planning: role</b> The role/importance of care planning varied between DPs. At one of the spectrum, care planning was an intrinsic part of the DP and all clients in the DP self-management program received a care plan. At the other end of the spectrum, clients did not necessarily have a care plan since it was not an intrinsic part of the DP self-management program.	<b>Self-management planning: role</b> For both DPs in Intervention Model 2 self-management planning was an intrinsic part of the DP self-management program where <i>all</i> clients in the DPs received a self-management plan
<b>Intervention Model 3</b> <ul style="list-style-type: none"> <li>• 'Generic'</li> <li>• Mixed participation in planning and</li> </ul>	<ul style="list-style-type: none"> <li>• Planning: 50%</li> <li>• Training: 55% (20% Stanford)</li> <li>• Support: 83%</li> </ul>	<ul style="list-style-type: none"> <li>• Less University educated</li> <li>• More smokers</li> </ul>	<b>Care/self-management planning: role</b> The key variation between the two DPs in Intervention Model 3 was one DP undertook self-management planning only, which was a standard activity which all	<b>Self-management planning: role</b> For both DPs in Intervention Model 3, self-management planning was an intrinsic part of the DP self-management program whereby all

<sup>6</sup> The relative comparisons made in this table for example, 'more' or 'less', refer to the proportionate representation that any particular characteristic has in relation to the overall distribution

Intervention Model	Intervention participation	Demographic profile <sup>6</sup>	Key Variations in Process between the DPs	Key Similarities in process between the DPs
<ul style="list-style-type: none"> <li>training activities</li> <li>High proportion sought support</li> </ul>			<p>clients received. Whilst the other DP undertook both self-management and care planning, which were both a standard activity which all clients in the DP received.</p> <p><b>Self-management planning: timing</b></p> <p>There was variation in the timing of when self-management planning was undertaken. The DP which completed the self-management plan immediately at the time of recruitment was at one end of the spectrum. Further along the spectrum was the DP which completed elements of the self-management plan at the time of recruitment, with the remainder of the plan being developed and refined over the course of the DP self-management program.</p>	<p>clients in the DP received a self-management plan.</p>
<p><b>Intervention Model 4</b></p> <ul style="list-style-type: none"> <li>Telephone coaching</li> <li>High level of participation</li> <li>No Stanford</li> </ul>	<ul style="list-style-type: none"> <li>Planning: 99%</li> <li>Training: 92% (0% Stanford)</li> <li>Support: 97%</li> </ul>	<ul style="list-style-type: none"> <li>More males</li> <li>More CALD</li> <li>More University educated</li> <li>More living with family</li> <li>More employed</li> <li>Broad age range</li> <li>More non-smokers</li> <li>More diabetes</li> </ul>	<p>N/A - Only one DP in Intervention Model 4</p>	<p>NA - Only one DP in Intervention Model 4</p>

#### *4.5.1.1 Analysis by Intervention type*

Due to the design of the SHCI (i.e. not a controlled trial), it was not possible to satisfactorily analyse the individual effects of planning, training and support on the quantitative measures for health status, health behaviour and service utilisation, because most of the Intervention Models consisted of some combination of Planning and/or Training and/or Support. Although some subgroup analysis was possible, it did not bring anything new to the analysis by Intervention Model which is presented below.

#### **4.5.2 Change in health over time by Intervention Model**

The analysis presented below aims to compare how the quantitative measures for health status, health behaviour and service utilisation changed over the three successive measurement points of the evaluation according to Intervention Model type.

##### *4.5.2.1 Overall Analysis*

The measures used for comparisons between the four Intervention Model types were considered at baseline, the middle and last measurement points. At each measurement point, frequency distributions, means, standard deviations, measures of skewness and kurtosis were inspected. Skewness between 1 and 2 was deemed acceptable and no transformations were required.

As indicated in Section 4.1.3, a repeated measures analysis was undertaken, in which only those clients who had complete data for all three measurement points (baseline, middle and last) were included in the analysis. This method analyses both between group effects (Model type) and within group effects (differences between repeated measures across measurement points).

Post hoc pairwise comparisons were undertaken to examine differences between individual Intervention Models.

##### *4.5.2.2 Specific issues identified for the analysis*

As for the whole group analysis, the same subset of measures was focussed upon to examine change over time:

- General Health;
- Health Distress;
- Coping with Symptoms;
- Satisfaction with Life;
- Psychological Distress;
- Visits to GP;

- Self Efficacy;
- Social Functioning.
- Times to Hospital; and

Also, as indicated previously, preliminary exploratory analysis revealed the importance of baseline levels of each measure. In order to make meaningful comparisons over time, a covariate was introduced to examine the effect of baseline level of each variable under investigation (ANCOVA).

To illustrate this adjustment, the following graph shows the unadjusted mean General Health score for each Intervention Model at each measurement point. It is clear that the baseline levels of General Health differ markedly between the Intervention Models.

**Figure 27 General Health by Model: Raw Data**

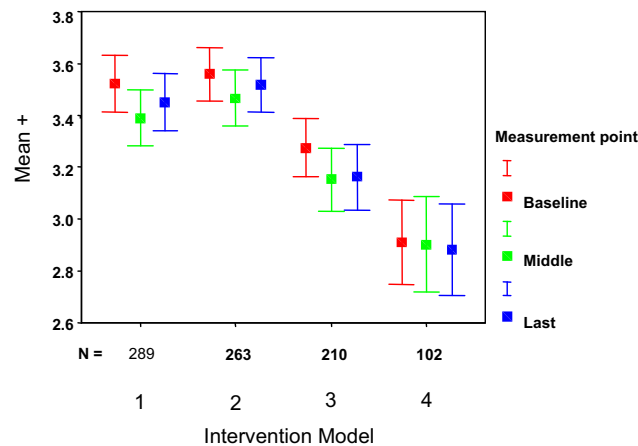
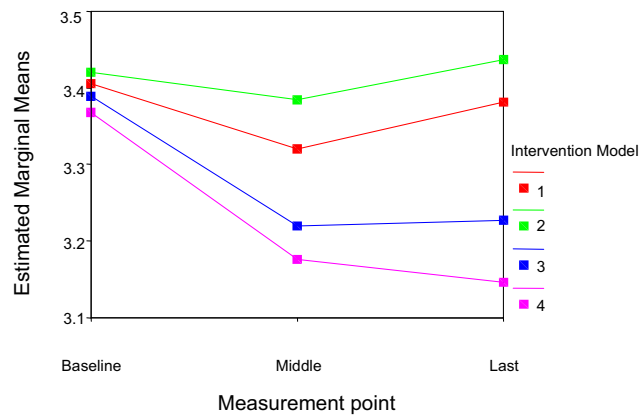


Figure 28 is identical to Figure 27 except that the comparison allows for the effect of the covariate, namely, General Health score at baseline. As a result, it is possible from Figure 28 to make a visual comparison between the adjusted means for the four Intervention Models over time, taking into account the effect of the covariate. Accordingly, the relativities between the groups and over time are more meaningful when displayed in adjusted form.

**Figure 28 Health by Intervention Model: Unadjusted Data**



Accordingly, the analysis for each outcome variable is presented in two parts:

1. A description of the raw data across the three measurement points (baseline, middle and last); and
2. A description of the results of the ANCOVA, where the change has been adjusted for baseline levels of health.

#### *4.5.2.3 General Health by Intervention Model*

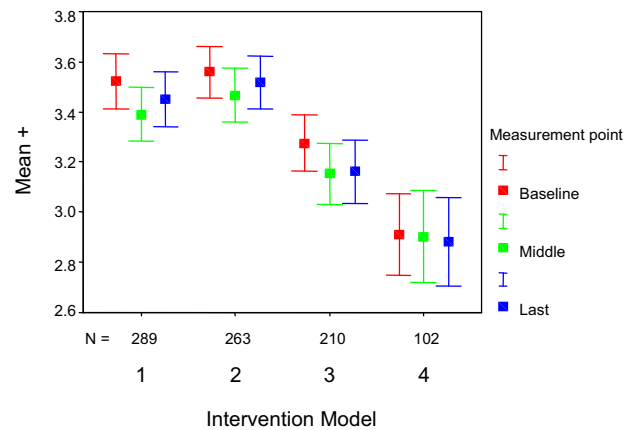
The General Health scale is measured on a five point scale – Excellent, Very Good, Good, Fair and Poor – and is used to measure the Health status/Health-related Quality of Life. To adjust for baseline level of General Health, a three level classification was introduced – Excellent to Very Good; Good; and Fair to Poor - for inclusion as a covariate in this analysis.

The data suggest that the clients in each Intervention Model had significantly different baseline levels of General Health: This is illustrated in Table 65 and Figure 29.

**Table 65 General Health by Intervention Model: Raw Data**

Intervention Model	General Health	Mean	95% Confidence Interval	
			Lower Bound	Upper Bound
1 n=289	Baseline	3.52	3.42	3.62
	Middle	3.39	3.29	3.50
	Last	3.45	3.34	3.56
2 n=263	Baseline	3.56	3.45	3.67
	Middle	3.47	3.36	3.58
	Last	3.52	3.41	3.63
3 n=210	Baseline	3.28	3.16	3.39
	Middle	3.15	3.03	3.28
	Last	3.16	3.04	3.29
4 n=102	Baseline	2.91	2.74	3.08
	Middle	2.90	2.72	3.08
	Last	2.88	2.70	3.06

**Figure 29 General Health by Intervention Model: Raw Data**



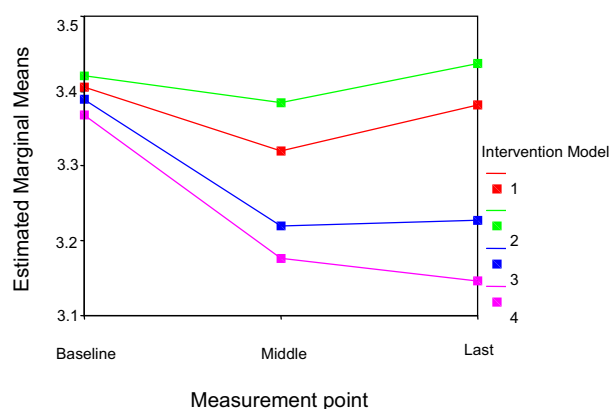
The results of the ANCOVA (which adjusted for the effect of the baseline level of General Health), are presented in Figure 30 and Table 66. The analysis revealed that there was an overall significant change in General Health over time ( $p < 0.0005$ ) and that the baseline level of General Health did have a significant effect on change in General Health ( $p < 0.0005$ ). However, the Type of Intervention Model did not have a significant effect on the change in General Health ( $p = 0.108$ ). As well as being a significant between groups (i.e. Excellent to Very Good; Good; and Fair to Poor) effect for baseline level of General Health ( $p < 0.0005$ ), there was also a significant between groups effect for Type of Intervention Model ( $p = 0.001$ ). Post-hoc tests suggested that the change in



General Health for clients in Intervention Model 1 and 2 differed from clients in Intervention Models 3 and 4, as indicated by Figure 30.

The full results of the ANCOVA are set out in Appendix 28.

**Figure 30 General Health: Adjusted Data**



**Table 66 General Health: Results of Analysis of Covariance**

Effect	Variable	F	df	p
Within groups	General Health	79.07	1.96	<0.0005
	General Health with Baseline Level	101.54	1.96	<0.0005
	General Health with Intervention Model	1.75	5.89	0.108
Between groups	Baseline level of General Health	1501.0	1	<0.0005
	Intervention Model	5.30	3	0.001

Taking  $p \leq 0.005$  as significant

### Conclusion

After adjusting for the effect of the baseline levels of General Health, the analysis indicated that:

- The level of General Health improved over time;
- The baseline level of General Health had a significant effect on the change in General Health over time;
- The direction of change in General Health status was similar within Intervention Models;
- The change in General Health status was significantly different between Intervention Models; and
- The change in General Health for clients in Intervention Model 1 and 2 was less than for clients in Intervention Models 3 and 4.

Overall, there were significant effects on General Health due to Intervention Model. General Health in Intervention Models 3 and 4 had greater improvement over time than Intervention Models 1 and 2.

#### 4.5.2.4 Psychological Distress by Intervention Model

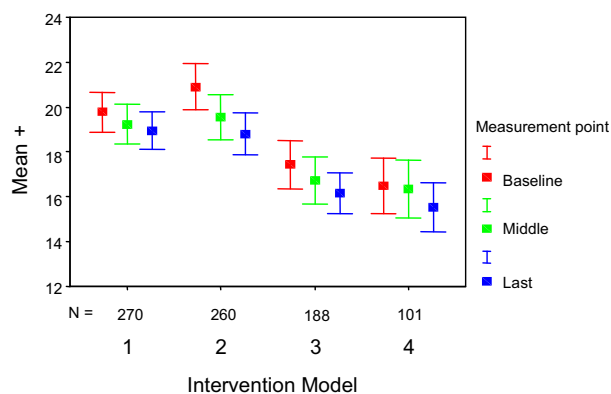
Psychological Distress was measured using the Kessler10. The baseline level of Psychological Distress was categorised into four groups: 1) Score 10 to 15; 2) Score 16 to 21; 3) Score 22 to 29; and 4) Score 30 to 50, for inclusion as a covariate in this analysis.

The data suggest that the clients in each Intervention Model have significantly different baseline Kessler 10 levels. This is illustrated in Table 67 and Figure 31.

**Table 67 Psychological Distress: Table of Raw Data**

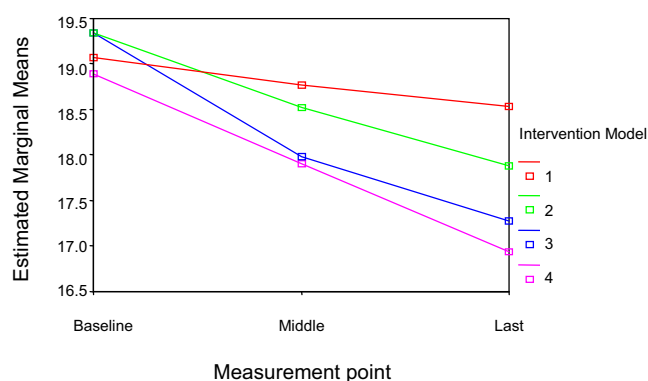
Intervention Model	Psychological Distress	Mean	95% Confidence Interval	
			Lower Bound	Upper Bound
1 n=270	Baseline	19.79	18.88	20.69
	Middle	19.23	18.33	20.14
	Last	18.96	18.14	19.77
2 n=260	Baseline	20.91	19.99	21.84
	Middle	19.55	18.63	20.48
	Last	18.80	17.97	19.63
3 n=188	Baseline	17.44	16.35	18.52
	Middle	16.73	15.64	17.82
	Last	16.15	15.17	17.14
4 n=101	Baseline	16.50	15.01	17.98
	Middle	16.34	14.85	17.82
	Last	15.53	14.20	16.87

**Figure 31 Psychological Distress: Raw Data**



The results of the ANCOVA (which adjusted for the effect of the baseline Psychological Distress) are presented in Figure 32 and Table 68. The analysis revealed that there was an overall significant change in Psychological Distress over time ( $p < 0.0005$ ), and that the baseline Psychological Distress level did have a significant effect on change in Psychological Distress ( $p < 0.0005$ ). However, the type of Intervention Model did not have a significant effect on the change in Psychological Distress ( $p = 0.123$ ). Although, there was a significant between groups effect for baseline level of Psychological Distress ( $p < 0.0005$ ), there was no significant between groups effect for type of Intervention Model ( $p = 0.013$ ).

**Figure 32 Psychological Distress: Adjusted Data**



**Table 68 Psychological Distress: Results of Analysis of Covariance**

Effect	Variable	F	df	p
Within groups	Psychological Distress	62.90	1.98	<0.0005
	Psychological Distress with Baseline Level	126.62	1.98	<0.0005

Effect	Variable	F	df	p
	Psychological Distress with Intervention Model	1.68	5.94	0.123
Between groups	Baseline level of Psychological Distress Intervention Model	1788.50	1	<0.0005
		1.89	3	0.130

Taking  $p \leq 0.005$  as significant

### Conclusion

After adjusting for the effect of the baseline levels of Psychological Distress, the analysis indicated that:

- The level of Psychological Distress decreased over time;
- The baseline level of Psychological Distress had a significant effect on the change in Psychological Distress over time;
- The direction of change in Psychological Distress scores was similar within Intervention Models; and
- The change in Psychological Distress score was not significantly different between Intervention Models.

Overall, there was no significant effect on Psychological Distress due to Intervention Model with scores decreasing for all Models.

#### 4.5.2.5 Satisfaction with Life by Intervention Model

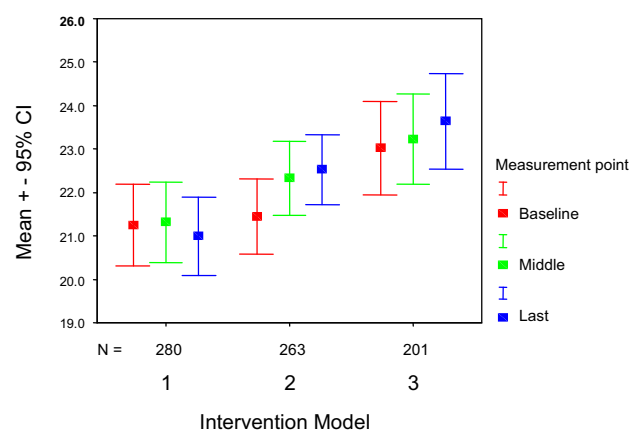
The Satisfaction with Life scale measures overall wellbeing. The baseline level of Satisfaction with Life was categorised into three groups: 1) High (Score 26-35); 2) Medium (Score 15-25), and 3) Low (Score <15), for inclusion as a covariate in the analysis.

The data suggest that the clients in each Intervention Model have significantly different baseline levels of Satisfaction with Life. This is illustrated in Table 69 and Figure 56.

**Table 69 Satisfaction with Life: Raw Data**

Intervention Model	Satisfaction with Life	Mean	95% Confidence Interval	
			Lower Bound	Upper Bound
1 n=280	Baseline	21.25	20.35	22.15
	Middle	21.31	20.44	22.19
	Last	21.00	20.13	21.87
2 n=263	Baseline	21.45	20.52	22.38
	Middle	22.33	21.43	23.24
	Last	22.53	21.63	23.43
3 n=201	Baseline	23.02	21.96	24.09
	Middle	23.23	22.19	24.26
	Last	23.64	22.61	24.67
4	Intervention Model 4 did not complete Satisfaction with Life at the last measurement point			

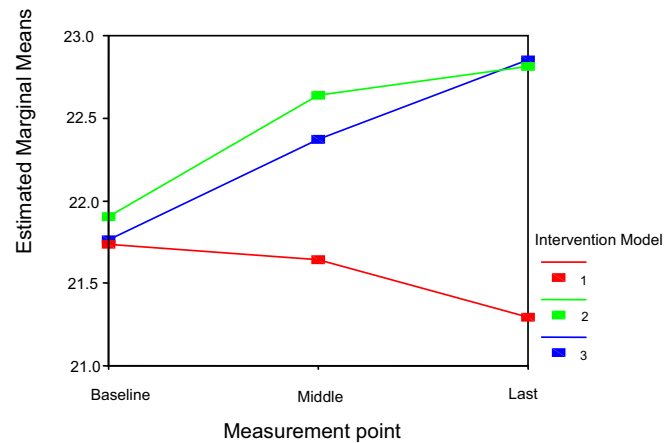
**Figure 33 Satisfaction with Life: Raw Data**



The results of the ANCOVA (which adjusted for the effect of the baseline level of Satisfaction with Life), are presented in Figure 34 and Table 70. The analysis revealed that there was an overall significant change in Satisfaction with Life over time ( $p < 0.0005$ ) and that the baseline level of Satisfaction with Life did have a significant effect on change in Satisfaction with Life ( $p < 0.0005$ ). However, the Type of Intervention Model did not have a significant effect on the change in Satisfaction with Life ( $p = 0.024$ ). As well as being a significant between groups (Low, Medium or High) effect for baseline level of Satisfaction with Life ( $p < 0.0005$ ), there was also a significant between groups effect for Type of Model ( $p = 0.005$ ). Post hoc tests suggested that Intervention Models 2 and 3 increased over time and Intervention Model 1 stayed stable (as indicated by Figure 34). For Intervention Models 2 and 3, there was still a significant effect

over time and no significant interaction term (i.e. they moved in the same direction).

**Figure 34 Satisfaction with Life: Adjusted Data**



**Table 70 Satisfaction with Life: Results of Analysis of Covariance**

Effect	Variable	F	df	p
Within groups	Satisfaction with Life	74.78	2	<0.0005
	Satisfaction with Life with Baseline Level	114.06	2	<0.0005
	Satisfaction with Life with Intervention Model	2.82	4	0.024
Between groups	Baseline level of Satisfaction with Life	2073.1	1	<0.0005
	Intervention Model	7	2	0.005
		5.26		

Taking  $p \leq 0.005$  as significant

### Conclusion

After adjusting for the effect of the baseline levels of Satisfaction with Life, the analysis indicated that:

- The level of Satisfaction with Life increased over time;
- The baseline level of Satisfaction with Life had a significant effect on change in Satisfaction with Life score over time;
- The direction of change in Satisfaction with Life scores was different within Intervention Models;
- The change in Satisfaction with Life was different between Intervention Models; and

- Intervention Models 2 and 3 increased over time whilst Intervention Model 1 stayed stable.

Overall, there were significant effects on Satisfaction with Life due to Intervention Model. Intervention Models 2 and 3 increased and Intervention Model 1 did not.

#### 4.5.2.6 Health Distress by Intervention Model

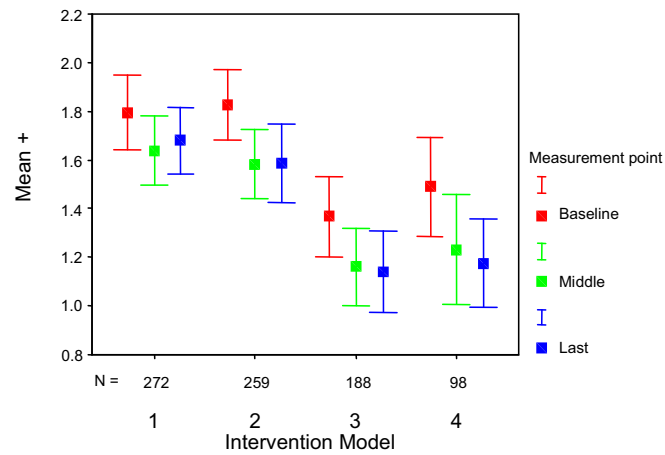
The Health Distress scale measures distress caused by the symptoms of any given health condition(s). The baseline level of Health Distress scale is categorised into four groups: 1) 0 to <1; 2) 1 to <2; 3) 2 to <3; and 4) 3 to highest and included as a covariate.

The data suggest that the clients in each Intervention Model have significantly different baseline levels of Health Distress. This is illustrated in Table 71 and Figure 35.

**Table 71 Health Distress: Raw Data**

Intervention Model	Health Distress	Mean	95% Confidence Interval	
			Lower Bound	Upper Bound
1 n=272	Baseline	1.79	1.65	1.94
	Middle	1.64	1.50	1.78
	Last	1.68	1.54	1.82
2 n=259	Baseline	1.83	1.68	1.97
	Middle	1.58	1.44	1.72
	Last	1.59	1.44	1.73
3 n=188	Baseline	1.37	1.20	1.54
	Middle	1.16	1.00	1.33
	Last	1.14	.97	1.31
4 n=98	Baseline	1.49	1.25	1.73
	Middle	1.23	1.00	1.46
	Last	1.18	.94	1.41

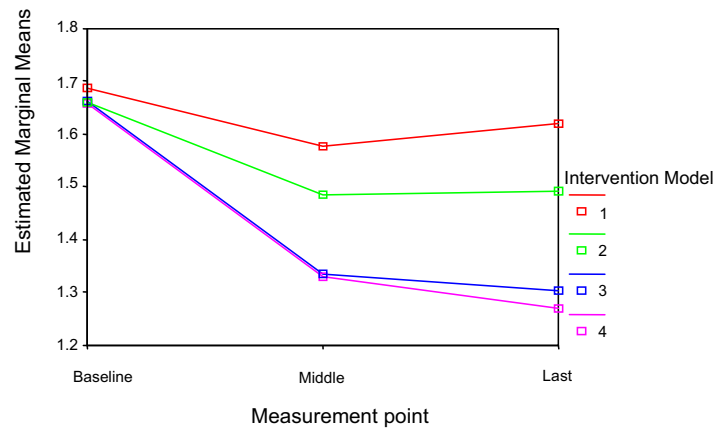
**Figure 35 Health Distress: Raw Data**



The results of the ANCOVA (which adjusted for the effect of the baseline level of Health Distress), are presented in Figure 36 and Table 72. The analysis revealed that there was an overall significant change in Health Distress over time ( $p < 0.0005$ ) and that the baseline level of Health Distress did have a significant effect on change in Health Distress ( $p < 0.0005$ ). However, the Type of Intervention Model did not have a significant effect on the change in Health Distress ( $p = 0.022$ ). As well as being a significant between groups effect for baseline level of Health Distress ( $p < 0.0005$ ), there was also a significant between groups effect for Type of Intervention Model ( $p = 0.002$ ). Post hoc tests suggested that the change in Health Distress in Intervention Model 1 and 2 differed from clients in Intervention Models 3 and 4.



**Figure 36 Health Distress: Adjusted Data**



**Table 72 Health Distress: Results of Analysis of Covariance**

Effect	Variable	F	df	p
Within groups	Health Distress	70.21	2	<0.0005
	Health Distress with Baseline level	142.80	2	<0.0005
	Health Distress with Intervention Model	2.47	6	0.022
Between groups	Baseline level of Health Distress	1470.10	1	<0.0005
	Intervention Model	5.14	3	0.002

Taking  $p \leq 0.005$  as significant

### Conclusion

After adjusting for the effect of the baseline levels of Health Distress, the analysis indicated that:

- The level of Health Distress decreased over time;
- The baseline level of Health Distress had a significant effect on change in Health Distress over time;
- The direction of change in Health Distress status was similar within Intervention Models;
- The change in Health Distress was different between Intervention Models; and
- The change in Health Distress in Intervention Model 1 and 2 differed from clients in Intervention Models 3 and 4.

Overall, there were significant effects due to Intervention Model. Health Distress in Intervention Models 3 and 4 decreased more than in Intervention Models 1 and 2.

#### 4.5.2.7 Coping with Symptoms by Intervention Model

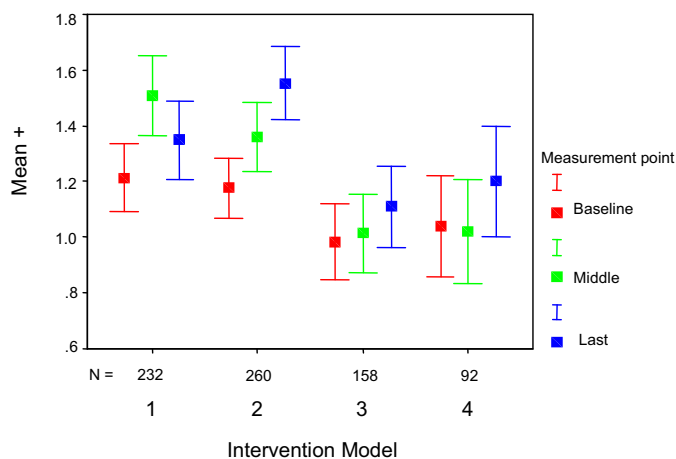
The Coping with Symptoms scale measures the control of symptoms. The baseline level of Coping with Symptoms scale was categorised into three groups: 1) 0 to <1; 2) 1 to <2; 3) 2 to <3; and 4) 3 to highest, for inclusion as a covariate in this analysis.

The data suggest that the clients in each Intervention Model have significantly different baseline levels of Coping with Symptoms. This illustrated in Table 73 and Figure 37.

**Table 73 Coping with Symptoms: Raw Data**

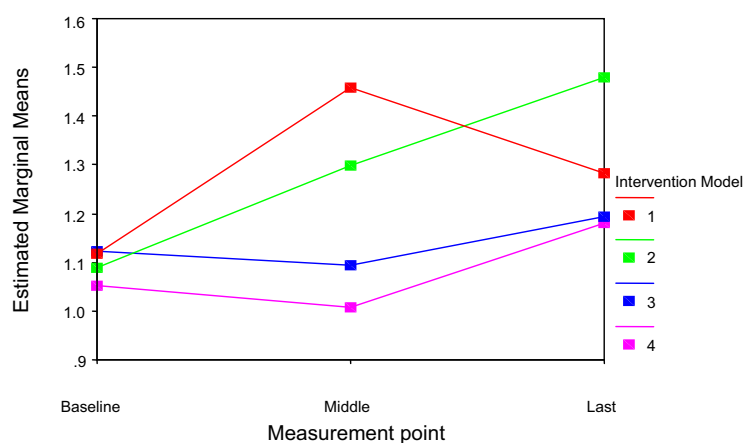
Intervention Model	Coping with Symptoms	Mean	95% Confidence Interval	
			Lower Bound	Upper Bound
1 n=212	Baseline	1.21	1.10	1.33
	Middle	1.51	1.38	1.64
	Last	1.35	1.22	1.48
2 n=221	Baseline	1.18	1.07	1.29
	Middle	1.36	1.24	1.48
	Last	1.55	1.43	1.68
3 n=143	Baseline	.98	.84	1.12
	Middle	1.01	.86	1.17
	Last	1.11	.95	1.27
4 n=81	Baseline	1.04	.86	1.22
	Middle	1.02	.81	1.23
	Last	1.20	.99	1.41

**Figure 37 Coping with Symptoms: Raw Data**



The results of the ANCOVA (which adjusted for the effect of the baseline level of Coping with Symptoms), are presented in Figure 38 and Table 72. The analysis revealed that there was an overall significant change in Coping with Symptoms over time ( $p < 0.0005$ ) and that the baseline level of Coping with Symptoms did have a significant effect on change in Coping with Symptoms ( $p < 0.0005$ ). The Type of Intervention Model also had a significant effect on the change in Coping with Symptoms ( $p < 0.0005$ ). As well as being a significant between groups effect for baseline level of Coping with Symptoms ( $p < 0.0005$ ), there was also a significant between groups effect for Type of Intervention Model ( $p = 0.001$ ). Post hoc tests suggested that the change in Coping with Symptoms in Intervention Model 1 and 2 differed from clients in Intervention Models 3 and 4.

**Figure 38 Coping with Symptoms: Adjusted Data**



**Table 74 Coping with Symptoms: Results of Analysis of Covariance**

Effect	Variable	F	df	p
Within groups	Coping with Symptoms	76.25	2	<0.0005
	Coping with Symptoms with Baseline Level	63.80	2	<0.0005
	Coping with Symptoms with Intervention Model	6.74	6	<0.0005
Between groups	Baseline level of Coping with Symptoms	1088.60	1	<0.0005
	Intervention Model	5.65	3	0.001

Taking  $p \leq 0.005$  as significant

### Conclusion

After adjusting for the effect of the baseline levels of Coping with Symptoms, the analysis indicated that:

- The level of Coping with Symptoms increased over time;
- The baseline level of Coping with Symptoms had a significant effect on change in Coping with Symptoms over time;
- The direction of change in Coping with Symptoms status was different within Intervention Models;
- The change in Coping with Symptoms score was different between Intervention Models; and
- The change in Coping with Symptoms in Intervention Model 1 and 2 differed from clients in Intervention Models 3 and 4.

Overall, there were significant effects due to Intervention Model. Coping with Symptoms scores for clients in Intervention Models 1 and 2 increased more than those for clients in Intervention Models 3 and 4.

#### 4.5.2.8 Social functioning by Intervention Model

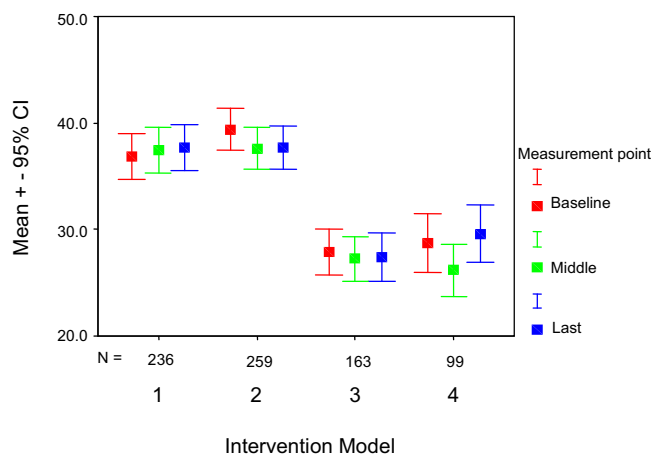
The Social Functioning scale measures the degree to which social functioning is intruded upon by any given health condition(s). The baseline level was categorised into three groups: 1) 0 to 24; 2) 25 to 49; and 3) 50 or more, for inclusion as a covariate in this analysis.

The data suggest that the clients in each Intervention Model have significantly different baseline levels of Social Functioning. This is illustrated in Table 75 and Figure 39.

**Table 75 Social Functioning: Raw Data**

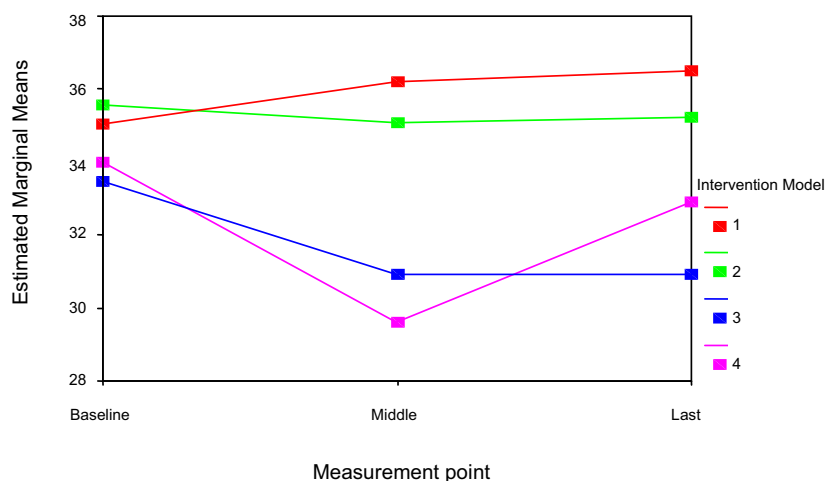
Intervention Model	Social Functioning	Mean	95% Confidence Interval	
			Lower Bound	Upper Bound
1 n=236	Baseline	36.86	34.88	38.85
	Middle	37.42	35.46	39.37
	Last	37.64	35.61	39.68
2 n=259	Baseline	39.42	37.52	41.32
	Middle	37.62	35.75	39.49
	Last	37.66	35.72	39.61
3 n=163	Baseline	27.86	25.47	30.25
	Middle	27.24	24.88	29.60
	Last	27.40	24.95	29.85
4 n=99	Baseline	28.75	25.68	31.82
	Middle	26.18	23.16	29.21
	Last	29.58	26.43	32.72

**Figure 39 Social Functioning: Raw Data**



The results of the ANCOVA (which adjusted for the effect of the baseline level of Social Functioning), are presented in Figure 40 and Table 76. The analysis revealed that there was an overall significant change in Social Functioning over time ( $p < 0.0005$ ) and that the baseline level of Social Functioning did have a significant effect on change in Social Functioning ( $p < 0.0005$ ). The Type of Intervention Model also had a significant effect on the change in Social Functioning ( $p < 0.002$ ). As well as being a significant between groups effect for baseline level of Social Functioning ( $p < 0.0005$ ), there was also a significant between groups effect for Type of Intervention Model ( $p = 0.001$ ). Post hoc tests suggested that the change in Social Functioning in Intervention Model 1 and 2 differed from clients in Intervention Models 3 and 4.

**Figure 40 Social Functioning: Adjusted Data**



**Table 76 Social Functioning: Results of Analysis of Covariance**

Effect	Variable	F	df	p
Within groups	Social Functioning	60.49	2	<0.0005
	Social Functioning with Baseline Level	76.73	2	<0.0005
	Social Functioning with Intervention Model	3.58	6	0.002
Between groups	Baseline level of Social Functioning	1130.40	1	<0.0005
	Intervention Model	9.81	3	<0.0005

Taking  $p \leq 0.005$  as significant

### Conclusion

After adjusting for the effect of the baseline levels of Social Functioning, the analysis indicates that:

- The level of interference with Social Functioning decreased over time;
- The baseline level of Social Functioning has a significant effect on change in Social Functioning over time;
- The direction of change in Social Functioning status is different within Intervention Models;
- The change in Social Functioning is different between Intervention Models; and
- The change in Social Functioning in Intervention Model 1 and 2 differs from clients in Intervention Models 3 and 4.

Overall, there were significant effects due to Intervention Model interface with Social Functioning in Intervention Models 3 and 4, where Social Functioning decreased more than in Intervention Models 1 and 2.

#### 4.5.2.9 Self Efficacy by Intervention Model

The Self Efficacy scale measures the confidence associated with managing health condition(s). The baseline level of Self Efficacy was categorised into three groups: 1) 0 to <5; 2) 5 to 7.5; and 3) 7.6 or more, for inclusion as a covariate in this analysis.

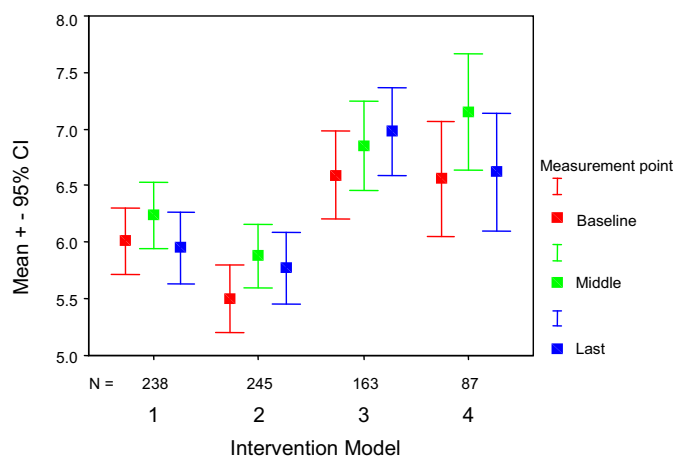
The data suggest that the clients in each Intervention Model have significantly different baseline levels of Self Efficacy. This is illustrated in Table 77 and Figure 41.

**Table 77 Self Efficacy: Raw Data**

Intervention Model	Self Efficacy	Mean	95% Confidence Interval	
			Lower Bound	Upper Bound
1 n=238	Baseline	6.01	5.71	6.31
	Middle	6.24	5.94	6.54
	Last	5.95	5.63	6.27
2 n=245	Baseline	5.50	5.20	5.80
	Middle	5.88	5.59	6.18
	Last	5.77	5.46	6.09
3 n=163	Baseline	6.60	6.23	6.96
	Middle	6.86	6.49	7.22
	Last	6.98	6.60	7.36
4 n=87	Baseline	6.56	6.06	7.06
	Middle	7.15	6.66	7.65
	Last	6.62	6.10	7.14

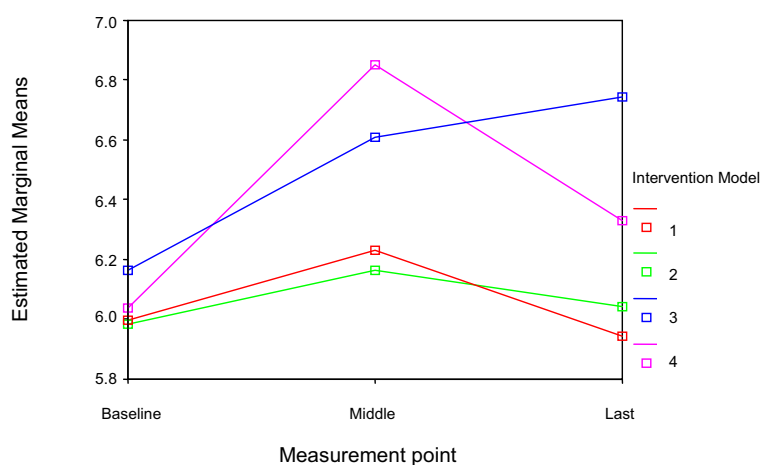


**Figure 41 Self Efficacy: Raw Data**



The results of the ANCOVA (which are adjusted for the effect of the baseline level of Self Efficacy), are presented in Figure 42 and Table 78. The analysis revealed that there was an overall significant change in Self Efficacy over time ( $p < 0.0005$ ) and that the baseline level of Self Efficacy did have a significant effect on change in Self Efficacy ( $p < 0.0005$ ). However, the Type of Intervention Model did not have a significant effect on the change in Self Efficacy ( $p < 0.025$ ). As well as being a significant between groups effect for baseline level of Self efficacy ( $p < 0.0005$ ), there was also a significant between groups effect for Type of Intervention Model ( $p = 0.001$ ). Post hoc tests suggested that the change in Self Efficacy in Intervention Model 1 and 2 differed from clients in intervention Models 3 and 4.

**Figure 42 Self Efficacy: Adjusted Data**



**Table 78 Self Efficacy: Results of Analysis of Covariance**

Effect	Variable	F	df	p
Within groups	Self Efficacy	98.60	1.96	<0.0005
	Self Efficacy with Baseline level	94.90	1.96	<0.0005
	Self Efficacy with Intervention Model	2.43	5.87	0.025
Between groups	Baseline level of Self Efficacy	1120.02	1	<0.0005
	Intervention Model	5.78	3	0.001

Taking  $p \leq 0.005$  as significant

### **Conclusion**

After adjusting for the effect of the baseline levels of Self Efficacy, the analysis indicates that:

- The level of Self Efficacy increased over time;
- The baseline level of Self Efficacy had a significant effect on change in Self Efficacy over time;
- The direction of change in Self Efficacy was similar within intervention Models;
- The change in Self Efficacy was different between Intervention Models; and
- The change in Self Efficacy in Intervention Model 1 and 2 differed from clients in Intervention Models 3 and 4.

Overall, there were significant effects due to Intervention Model. Self Efficacy in Intervention Models 3 and 4 increased more than in Intervention Models 1 and 2.

#### *4.5.2.10 Visits to GP by Intervention Model*

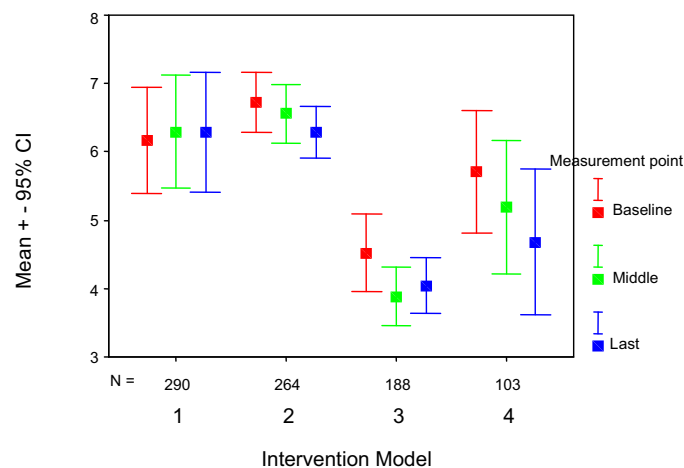
The Visits to GP scale measured the number of visits made to the GP in the past six months. The baseline level of GP visits was categorised into three groups: 1) 0 to 3 visits; 2) 4 to 7 visits; and 3) 8 or more visits, for inclusion as a covariate in this analysis.

The data suggest that the clients in each Intervention Model have significantly different baseline levels of the number of Visits to GP. This is illustrated in Table 79 and Figure 43.

**Table 79 Visits to GP: Raw Data**

Intervention Model	GP Visits	Mean	95% Confidence Interval	
			Lower Bound	Upper Bound
1 n=290	Baseline	6.18	5.59	6.76
	Middle	6.30	5.71	6.89
	Last	6.28	5.67	6.89
2 n=264	Baseline	6.73	6.12	7.34
	Middle	6.56	5.95	7.18
	Last	6.28	5.64	6.92
3 n=188	Baseline	4.52	3.80	5.24
	Middle	3.88	3.15	4.62
	Last	4.04	3.28	4.80
4 n=103	Baseline	5.71	4.73	6.69
	Middle	5.18	4.20	6.17
	Last	4.68	3.65	5.71

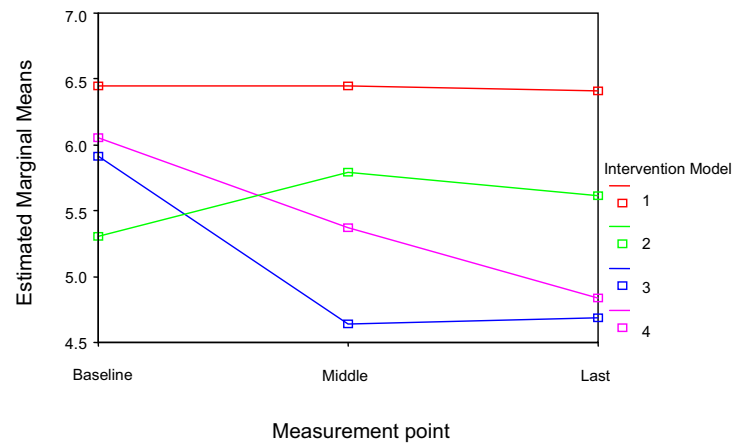
**Figure 43 Visits to GP: Raw Data**



The results of the ANCOVA (which adjusted for the effect of the baseline level of Visits to GP), are presented in Figure 44 and Table 80. The analysis revealed that there was an overall significant change in Visits to GP over time ( $p < 0.0005$ ) and that the baseline level of Visits to GP did have a significant effect on change in Visits to GP ( $p < 0.0005$ ). However, the Type of Intervention Model did not have a significant effect on the change in Visits to GP ( $p = 0.02$ ). As well as being a significant between groups effect for baseline level of Visits to GP ( $p < 0.0005$ ), there was also a significant between groups effect for Type of Intervention Model

( $p < 0.0005$ ). Post hoc tests suggested that the change in Visits to GP in Intervention Model 1 differed from clients in Intervention Models 2, 3 and 4.

**Figure 44 Visits to GP: Adjusted Data**



**Table 80 Visits to GP: Results of Analysis of Covariance**

Effect	Variable	F	df	p
Within groups	Number visits to GP	42.61	1.92	<0.0005
	Number visits to GP with Baseline level	59.95	1.92	<0.0005
	Number visits to GP with Intervention Model	2.55	5.75	0.02
Between groups	Baseline level of Number visits to GP	533.68	1	<0.0005
	Intervention Model	8.42	3	<0.0005

Taking  $p \leq 0.005$  as significant

### Conclusion

After adjusting for the effect of the baseline levels of number Visits to GP, the analysis indicates that:

- The level of number Visits to GP decreased over time;
- The baseline level of Visits to GP had a significant effect on change in number of Visits to the GP over time;
- The direction of change in Visits to GP was similar within Intervention Models;
- The change in the number of Visits to GP was different between Intervention Models; and
- The change in Visits to GP for clients in Intervention Model 1 differed from clients in Intervention Models 2, 3 and 4.

Overall, there were significant effects due to Intervention Model. The number of Visits to GP decreased more in Intervention Models 2, 3 and 4 than in Intervention Models 1.

#### 4.5.2.11 Times in Hospital by Intervention Model

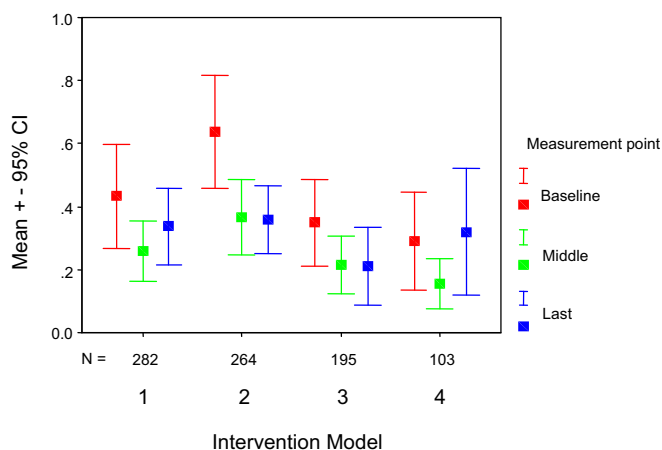
The Times in Hospital scale measured the number of times spent in hospital for one night or more in the past six months. The baseline was categorised into three groups: 1) None at all; 2) Once; and 3) More than once, for inclusion as a covariate in this analysis.

The data suggest that the clients in each Intervention Model have significantly different baseline levels of the number of Times in Hospital. This is illustrated in Table 81 and Figure 45.

**Table 81 Times in Hospital: Raw Data**

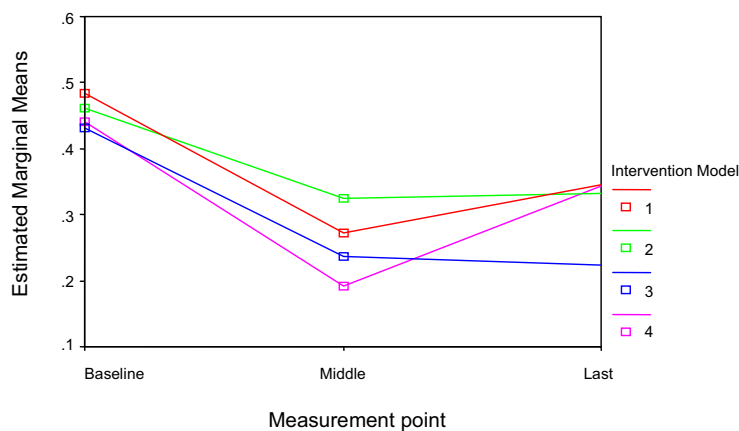
Intervention Model	Times in Hospital	Mean	95% Confidence Interval	
			Lower Bound	Upper Bound
1 n=282	Baseline	.43	.28	.58
	Middle	.26	.16	.35
	Last	.34	.23	.45
2 n=264	Baseline	.64	.48	.79
	Middle	.37	.27	.46
	Last	.36	.24	.48
3 n=195	Baseline	.35	.17	.53
	Middle	.22	.10	.33
	Last	.21	.08	.34
4 n=103	Baseline	.29	.04	.54
	Middle	.16	.00	.31
	Last	.32	.14	.51

**Figure 45 Times in Hospital: Raw Data**



The results of the ANCOVA (which are adjusted for the effect of the baseline level of Times in Hospital), are presented in Figure 46 and Table 82. The analysis revealed that there was an overall significant change in Times in Hospital over time ( $p < 0.0005$ ) and that the baseline level of Times in Hospital did have a significant effect on change in Times in Hospital ( $p < 0.0005$ ). However, the Type of Intervention Model did not have a significant effect on the change in Times in Hospital ( $p = 0.862$ ). There was also a significant between groups effect for baseline level of Times in Hospital ( $p < 0.0005$ ), however, there was no significant between groups effect for Type of Intervention Model ( $p = 0.458$ ), therefore it was not appropriate to undertake post hoc tests.

**Figure 46 Times in Hospital: Adjusted Data**



**Table 82 Times in Hospital: Results of Analysis of Covariance**

<b>Effect</b>	<b>Variable</b>	<b>F</b>	<b>df</b>	<b>p</b>
Within groups	Times in Hospital	177.71	1.93	<0.0005
	Times in Hospital with Baseline level	273.09	1.93	<0.0005
	Times in Hospital with Intervention Model	0.42	5.78	0.862
Between groups	Baseline level of Times in Hospital	548.07	1	<0.0005
	Intervention Model	0.87	3	0.458

Taking  $p \leq 0.005$  as significant

### **Conclusion**

After adjusting for the effect of the baseline levels of Times in Hospital, the analysis indicated that:

- The level of Times in Hospital decreased over time;
- The baseline level of Times in Hospital had a significant effect on the change in the number of Times in Hospital over time;
- The direction of change in Times in Hospital was similar within Intervention Models; and
- The change in Times in Hospital was similar between Intervention Models.

Overall, there were significant effects due to Intervention Model.

#### *4.5.2.12 Summary of Results: Intervention Model*

This analysis provided an indication as to what extent changes in participant health behaviour, health status and service utilisation is influenced by Intervention Model, after adjusting for baseline health level.

### **Overall change**

Whilst there was some variation over time, the overall trend was for an improvement for the health indicators and a reduction in GP and Hospital visits.

Some variation was also noted between Intervention Models:

- The change in General Health, Health Distress, Coping with Symptoms, Self Efficacy and Social Functioning was significantly different between Intervention Models. In general, clients in Intervention Model 1 and 2 improved significantly less than those in Intervention Models 3 and 4.

- The reduction in Number of visits to GP was significantly less for Intervention Model 1 compared to Intervention Models 2, 3 and 4.

However, the change in Psychological Distress score was not significantly different between Intervention Models, all improved. In addition, the change in Times in Hospital was similar between Intervention Models.

### **Direction**

The summary of direction of change for the Intervention Models indicated:

- The direction of the change in General Health, Psychological Distress, Health Distress and Self Efficacy was similar within Intervention Models i.e. the improvement was similar for all of the Intervention Models.
- The direction of change for Satisfaction with Life, Coping with Symptoms and Social Functioning was different within Intervention Models.

### **Interpretation**

All Intervention Models were associated with an improvement on most indices. However overall, once adjusted for initial presentation, Intervention Models 3 and 4 appeared to improve more consistently than Intervention Models 1 and 2.

#### **4.5.3 Demographic characteristics**

The relationship at baseline between health and behaviour status were reviewed.

A number of different tests were used (for example, ANOVA and t-tests) as appropriate to the nature of the variables, and a conservative significance level was set to offset the large number of tests undertaken. All of the filled cells indicate that a significant association was found between variables.

The many relationships found at baseline between health behaviour and status, and demographic characteristics are illustrated in the following table. For example, females were higher reporters of illness-related distress (Health Distress) and of Psychological Distress. On the other hand, they were also higher reporters of Self Efficacy and cognitive symptom control (Coping with Symptoms). Similarly, younger participants were higher reporters of illness related distress (Health Distress) and intrusiveness of condition on Social Functioning, together with reporting higher levels of Psychological Distress and lower levels of overall wellbeing (Satisfaction with Life). However, younger participants were also higher reporters of cognitive symptom control (Coping with Symptoms) at baseline.



**Table 83 Baseline group differences in health behaviour and status of participants in the non-Indigenous DPs**

	Sex	Age Grp	Langu- age	Qual'n	Employ- m't	Pension	Living	Accom- dt'n	Carer	Condit'n
Self-efficacy			*		*	*			*	*
Symptom	*	*			*	*				
General health			*	*	*	*			*	*
Distress	*	*	*		*				*	*
Intrusiveness		*	*		*	*			*	*
K10 Total	*	*	*	*	*	*			*	*
Life satisfaction		*			*	*	*			*
GP visits					*				*	
Hospital stays					*				*	*

\* Differences significant at  $p < 0.005$  (T-tests, ANOVA)

These additional factors (for example, sex, age, GP visits), together with the impact of Intervention Model and type which are discussed below, are considered in more detail as part of the multi-variate analysis which is set out in Section 4.5.4.

#### **4.5.4 Multivariate analysis**

Multivariate analysis was used to identify whether there are particular predictors of change among selected outcome variables.

##### *4.5.4.1 Analysis undertaken*

A stepwise approach was taken in which variables were progressively added into the multivariate model until the contribution made by the next variable was not significant (forward conditional). The final analysis only included those variables which were significant. The number and type of variables included in the analysis are described in full at the beginning of each Section. Estimates of the coefficients associated with each independent significant variable that best predicted the value of the dependent variable are also presented.

Multiple Linear Regression estimates the coefficients of the linear equation, involving one or more independent variables that best predict the value of the

dependent variable. It is most suited to situations where the dependent variable is continuous. In this study, it has been used to predict health outcome scores at the middle point (the dependent variable) from independent variables such as age, sex, baseline level etc. This method has also been used to predict health outcome change scores at the middle point (the dependent variable) using baseline level and health outcome change scores at the middle point.

#### *4.5.4.2 Building the multivariate models*

A number of variables were identified for inclusion as part of the multivariate analysis.

From the analysis described above, certain demographic variables were identified as being important for further consideration:

- The chronic condition which had most impact on life since it was hypothesised that this could influence change;
- Variables which were often correlated with health behaviours/status and were reasonably prevalent within the cohort (for example, have a carer); and
- It is usual to include such variables in multivariate analysis (for example, age, sex).

For the whole group, the repeated measures analysis showed that the greatest changes were seen between baseline and middle for the following health variables:

- General Health;
- Psychological Distress;
- Health Distress;
- Coping with Symptoms;
- Self Efficacy;
- Social Functioning; and
- GP visits.

Also, the repeated measures analysis by Intervention Model suggested a clustering between Intervention Models 1 and 2 and a similarity of effect for Intervention Models 3 and 4. A dichotomous variable was created to allow this factor to be included in the multivariate analysis.

Depending on the question being asked, sub-groups of the variables were included in the analysis of each multivariate model. A list of the variables used in the multivariate analysis is set out in the following table.

**Table 84 Variables included in the multiple regression equations**

<b>Categorical Variables</b>	<b>Label</b>
<b>Baseline demographic variables</b>	
Sex	Male=1; Female=2
Age	In years
Have a carer or not	Yes=1; No=2
Arthritis – condition most impact on life	No=0; Yes=1
Chronic respiratory condition – most impact on life	No=0; Yes=1
Cardiovascular disease – condition most impact on life	No=0; Yes=1
Other – condition most impact on life	No=0; Yes=1
Number of conditions	Range 0-8
<b>Service use</b>	
Number of GP visits	Ranked
<b>New variable</b>	
Intervention Model type	Model 1 or 2=1, Model 3 or 4=2
<b>Continuous variable</b>	<b>Label</b>
<b>Baseline level of:</b>	
General Health	Continuous
Psychological Distress	Continuous
Coping with Symptoms	Continuous
Self-Efficacy	Continuous
Social Functioning	Continuous
Health Distress	Continuous
Satisfaction with Life	Continuous

#### 4.5.4.3 Prediction of middle level of General Health

To identify the factors, known at baseline which predict the middle level of General Health a stepwise analysis was undertaken from which seven significant variables were identified for inclusion in the multivariate model (in order of inclusion):

- General Health at baseline;
- Psychological Distress at baseline;
- Number of GP Visits;
- Chronic respiratory disease – condition most impact on life;

- Age;
- Satisfaction with Life at baseline; and
- Arthritis – condition most impact on life.

The R<sup>2</sup> from this initial multivariate model was 0.409, indicating that 41% of the variance in the middle level of General Health could be explained by this combination of factors. Nine outliers with standardised residual values of more than three standard deviations from the mean were identified.

The regression analysis was then repeated with these significant variables, but with the observed outliers removed, the results of which are shown in Table 85 and Table 86.

**Table 85 Summary multivariate model for the prediction of middle General Health**

R	R Square	Adjusted R Square	Std. Error of the Estimate	R Square Change	Change Statistics			Sig. F Change
					F Change	df1	df2	
.691 <sup>a</sup>	.477	.472	.662	.477	104.476	7	802	.000

a. Predictors: (Constant), Arthritis condition most impact, Satisfaction with Life – baseline score, Chronic Respiratory condition most impact, GP Visits, Age, General Health, Psychological Distress – baseline total

b. Dependent Variable: General Health

**Table 86 Predictive coefficients of the middle level of General Health**

	Unstandardised Coefficients		Standardised Coefficients		Sig.
	B	Std. Error	Beta	t	
(Constant)	.721	.227		3.177	.002
General Health – baseline	.537	.031	.524	17.579	.000
Psychological Distress – baseline total	.010	.004	.089	2.679	.008
Satisfaction with Life – baseline score	-.012	.004	-.103	-3.130	.002
Age	.007	.002	.074	2.768	.006
GP Visits	.159	.032	.135	4.948	.000
Chronic Respiratory condition that impacts most	.224	.086	.069	2.603	.009
Arthritis condition that impacts most	.091	.051	.048	1.790	.074

a. Dependent Variable: General Health

### Summary of results

Predicted middle level of General Health was better (lower score) if:

- General Health at baseline was better;
- Psychological Distress at baseline was lower;
- GP Visits at baseline was lower;

- Chronic respiratory condition was not the condition that impacts most on life;
- Age was lower;
- Satisfaction with Life score at baseline was higher; and
- Arthritis was not the condition that impacts most on life.

The final  $R^2$  increased to 0.477, indicating that 48% of the variance in middle level of General Health could be explained using this combination of factors.

#### 4.5.4.4 Prediction of middle level of Psychological Distress

To identify the factors, known at baseline, which predict the middle level of Psychological Distress, a stepwise analysis was undertaken from which five significant variables were identified for inclusion in the multivariate model (in order of inclusion):

- Psychological Distress at baseline;
- Self Efficacy at baseline;
- Satisfaction with Life at baseline;
- General Health at baseline; and
- Coping with Symptoms at baseline.

The  $R^2$  was 0.455, indicating that 46% of the variance in middle level of Psychological Distress could be explained by this combination of factors. 12 outliers with standardised residual values of more than three standard deviations from the mean were identified.

The regression analysis was then repeated with these significant variables, but with the observed outliers removed, the results of which are shown in Table 87 and Table 88.

**Table 87 Summary multivariate model for the prediction of middle Psychological Distress**

R	R Square	Change Statistics						
		Adjusted R Square	Std. Error of the Estimate	R Square Change	F Change	df1	df2	Sig. F Change
.764 <sup>a</sup>	.584	.581	4.74397	.584	200.373	5	713	.000

a. Predictors: (Constant), Model type, Coping with Symptoms – baseline mean, Sex

b. Dependent Variable: Coping with Symptoms – six months mean

**Table 88 Predictive coefficients of the middle level of Psychological Distress**

	Unstandardised Coefficients		Standardised Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	8.789	1.628		5.399	.000
Self Efficacy – baseline mean	-.263	.096	-.086	-2.746	.006
Psychological Distress – baseline total	.613	.032	.633	19.437	.000
Satisfaction with Life – baseline score	-.090	.030	-.094	-3.003	.003
General Health - baseline	.307	.237	.037	1.293	.196
Coping with Symptom – baseline mean	.182	.207	.022	.882	.378

a. Dependent Variable: Psychological Distress – six months total

### Summary of results

The predicted middle level of Psychological Distress was lower if:

- Psychological Distress at baseline was lower;
- Self Efficacy at baseline was higher;
- Satisfaction with Life score at baseline was higher;
- General Health at baseline was better (lower score); and
- Coping with Symptoms at baseline was higher.

The final  $R^2$  increased to 0.584, indicating that 58% of the variance in middle level of Psychological Distress could be explained using this combination of factors.

#### 4.5.4.5 Prediction of middle level of Coping with Symptoms

To identify the factors, known at baseline, which predict the middle level of Coping with Symptoms, a stepwise analysis was undertaken from which three significant variables were identified for inclusion in the multivariate model (in order of inclusion):

- Coping with Symptoms at baseline;
- Sex; and
- Intervention Model type.

The  $R^2$  was 0.304, indicating that 30% of the variance in middle level of Coping with Symptoms could be explained by this combination of factors. Five outliers

with standardised residual values of more than three standard deviations from the mean were identified.

The regression analysis was then repeated with these significant variables, but with the observed outliers removed, the results of which are shown in Table 89 and Table 90.

**Table 89 Summary multivariate model for the prediction of middle Coping with Symptoms**

R	R Square	Adjusted R Square	Std. Error of the Estimate	R Square Change	Change Statistics			Sig. F Change
					F Change	df1	df2	
.614 <sup>a</sup>	.377	.375	.78576	.377	155.358	3	770	.000

a. Predictors: (Constant), Model type, Coping with Symptoms – baseline mean, Sex

b. Dependent Variable: Coping with Symptoms – six months mean

**Table 90 Predictive coefficients of the middle level of Coping with Symptoms**

	Unstandardised Coefficients		Standardised Coefficients		
	B	Std. Error	Beta	t	Sig.
(Constant)	.561	.147		3.821	.000
Coping with Symptoms – baseline mean	.639	.032	.573	19.895	.000
Sex	.181	.062	.085	2.935	.003
Intervention Model type	-.235	.061	-.112	-3.874	.000

a. Dependent Variable: Coping with Symptoms – six months total

### Summary of results

The predicted middle level of Coping with Symptoms was higher if:

- Coping with Symptoms at baseline is higher;
- The sex is Female; and
- Intervention Model type is 1 or 2.

The final  $R^2$  increased to 0.377, indicating that 38% of the variance in middle level of Symptom Control could be explained using this combination of factors.

#### 4.5.4.6 Prediction of middle level of Self Efficacy

To identify the factors, known at baseline, which predict the middle level of Self Efficacy, a stepwise analysis was undertaken from which five significant variables were identified for inclusion in the multivariate model (in order of inclusion):

- Self Efficacy at baseline;

- Satisfaction with Life at baseline;
- Age;
- General Health at baseline; and
- Psychological Distress at baseline.

The R<sup>2</sup> was 0.405, indicating that 41% of the variance in middle level of Self Efficacy could be explained by this combination of factors. Six outliers with standardised residual values of more than three standard deviations from the mean were identified.

The regression analysis was then repeated with these significant variables, but with the observed outliers removed, the results of which are shown in Table 89 and Table 90.

**Table 91 Summary multivariate model for the prediction of middle of Self Efficacy**

R	R Square	Adjusted R Square	Std. Error of the Estimate	R Square Change	Change Statistics			Sig. F Change
					F Change	df1	df2	
.662 <sup>a</sup>	.439	.435	1.76882	.439	114.959	5	736	.000

- a. Predictors: (Constant), Age, General Health, Psychological Distress – baseline total, Self Efficacy – baseline mean, Satisfaction with Life – baseline score  
 b. Dependent Variable: Self Efficacy – six months mean

**Table 92 Predictive coefficients of the middle level of Self Efficacy**

	Unstandardised Coefficients		Standardised Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	6.308	.714		8.834	.000
General Health – baseline	-.254	.087	-.096	-2.910	.004
Psychological Distress – baseline total	-.039	.011	-.128	-3.537	.000
Satisfaction with Life – baseline score	.060	.011	.196	5.342	.000
Self Efficacy – baseline mean	.396	.035	.406	11.452	.000
Age	-.029	.007	-.124	-4.314	.000

- a. Dependent Variable: Self Efficacy – six months mean

### Summary of results

The predicted middle level of Self Efficacy was higher if:

- Self Efficacy at baseline was higher;
- Satisfaction with Life at baseline was higher;
- Age was lower;



- General Health at baseline was better (lower score); and
- Psychological Distress at baseline was lower.

The final R<sup>2</sup> increased to 0.439, indicating that 44% of the variance in middle level of Self Efficacy could be explained using this combination of factors.

### Overall summary of results

The above analysis appears to indicate that those clients who reported having good health (as indicated by them having better General Health; lower Psychological Distress; higher Satisfaction with Life; and being younger (Age)) at the middle measurement point also reported having good health at baseline.

#### 4.5.5 Predicting who benefits most

There may be a different set of explanatory factors influencing an improvement in self reported health status from baseline to middle as opposed to those who reported no change or a decrease in self reported health status.

The mean scores for each of these three subsets at baseline and middle with the change, together with their distribution, is shown in the table below.

**Table 93 Change in Health Outcome between Baseline and Middle**

Health measure	Clients who improved in self reported health status				Clients who stayed the same				Clients who got worse in self reported health status			
	Mean score			N	Mean score			N	Mean score			N
	Baseline	Middle	Change		Baseline	Middle	Change		Baseline	Middle	Change	
Psychological Distress	21.5 (8.1)	16.3 (6.0)	-5.26	408	15.1 (6.4)	NA	0.00	105	17.6 (6.7)	22.2 (8.4)	4.56	325
General Health	3.9 (0.8)	2.7 (0.8)	-1.18	227	3.4 (0.9)	NA	0.00	484*	2.8 (0.8)	3.9 (0.8)	1.16	156
Health Distress	2.15(1.14)	1.11 (0.95)	-1.04	404	0.99 (1.22)	NA	0.00	113	1.29 (1.03)	2.06 (1.16)	0.84	326
Coping with Symptoms	0.96 (0.80)	1.79 (0.97)	0.84	290	0.58 (0.71)	NA	0.00	101	1.56 (0.89)	0.86 (0.81)	-0.70	390
Social Functioning	39.8 (16.6)	28.9 (14.1)	-10.91	375	25.3 (15.7)	NA	0.00	56	31.0 (14.1)	40.4 (15.6)	9.38	361
Self Efficacy	5.20 (2.22)	7.08 (2.04)	1.89	314	7.34 (2.71)	NA	0.00	60	7.00 (2.15)	5.37 (2.37)	-1.63	404
Satisfaction with Life	19.3 (7.15)	24.5 (6.65)	5.15	370	22.8 (8.70)	NA	0.00	94	24.6 (7.01)	20.1 (7.35)	-4.58	390

From the above table it can be seen that those who improved tended to have worse baseline scores than those who did not, which is consistent with the

univariate analysis presented Section 4.4.2. General Health displayed the same trend even though 55% of clients rated themselves exactly the same.

The fact that General Health did not change dramatically indicates that there was no ‘halo effect’, i.e. whilst clients have reported an improvement in the management of their condition, this has not influenced the way they perceive their actual health status. This provides some validation to the results, since it strengthens the reliance that can be placed on this subjective (self reported) evidence.

Ultimately however, there are many aspects of health change which were not measured as part of the evaluation, and given that the changes outlined above are both small and inconsistent it may not be possible to fully understand why some clients did not improve.

To explore this issue further, an additional series of multivariate analyses were undertaken.

#### 4.5.5.1 Analysis undertaken

A set of multivariate analyses were developed to investigate if it was possible to predict the significant factors associated with whether: 1) clients improved; 2) stayed the same; or 3) got worse from baseline to the middle measurement point. Due to the change score of those staying the same being zero (i.e. no variance), it was not possible to run a separate analysis on these clients, instead an analysis was run in which the predicted change of both those clients who did not change and those who deteriorated was included.

These analyses were performed on a discrete set of 11 variables (see Table 94) where previously reported univariate analyses had reported differences in changes over time and resultant statistical power.

**Table 94 Variables included in the sub-set analysis**

<b>Categorical Variables</b>	<b>Label</b>
Sex	Male=1; Female=2
Age	In years
Intervention Model type	Model 1 or 2=1, Model 3 or 4=2
<b>Continuous variable</b>	<b>Label</b>
<b>Baseline level of:</b>	
Variable to be predicted	Continuous
<b>Middle measurement point change in:</b>	

Continuous variable	Label
General Health	Continuous
Psychological Distress	Continuous
Coping with Symptoms	Continuous
Self-Efficacy	Continuous
Social Functioning	Continuous
Health Distress	Continuous
Satisfaction with Life	Continuous

The results showed that the predictive power of the variables included in the analyses was greater for the subsets of data where client scores improved over time. For those where the percentage of variance explained was greater than 35%, a full description of the results follows.

For the clients who reported a deterioration in self reported health over time (and/or stayed the same), the percentages of variance are very small (4.6% to 29.3%) and are only reported in summary form in Appendix 29. That it was not possible to build robust predictive multivariate models for these outcomes suggests that the evaluation did not collect information which effectively measured deterioration.

#### 4.5.5.2 Prediction of improvement in Psychological Distress

To identify the factors, known at the middle point, which predict improvement in Psychological Distress, a stepwise analysis was undertaken from which six significant variables were identified, (in order of inclusion):

- Psychological Distress at baseline;
- Change in Social Functioning;
- Change in Health Distress;
- Age;
- Change in Self Efficacy; and
- Change in Satisfaction with Life score.

The results of this analysis are shown in Table 95 and Table 96.

**Table 95 Summary multivariate model for the prediction of improvement in Psychological Distress**

R	R Square	Adjusted R Square	Std. Error of the Estimate	R Square Change	Change Statistics			Sig. F Change
					F Change	df1	df2	
.743 <sup>a</sup>	.552	.544	3.02189	.552	64.949	6	316	.000

- a. Predictors: (Constant), Age, Health Distress – baseline to middle, Psychological Distress – baseline total, Satisfaction with Life – baseline to middle, Self Efficacy – baseline to middle, Social Functioning – baseline to middle  
b. Dependent Variable: Psychological Distress – baseline to middle

**Table 96 Predictive coefficients for the improvement in Psychological Distress**

	Unstandardised Coefficients		Standardised Coefficients		Sig.
	B	Std. Error	Beta	t	
(Constant)	6.763	1.291		5.237	.000
Psychological Distress – baseline total	-.355	.022	-.623	-16.115	.000
Social Distress – baseline to middle	.090	.014	.261	6.447	.000
Health Distress – baseline to middle	.299	.171	.070	1.747	.082
Self Efficacy – baseline to middle	-.246	.089	-.110	-2.756	.006
Satisfaction with Life – baseline to middle	-.067	.029	.089	-2.270	.024
Age	-.053	.017	-.125	-3.218	.001

- a. Dependent Variable: Psychological Distress – baseline to middle

### Summary of results

The predicted reduction in Psychological Distress between the baseline and middle measurement point was greater if:

- Psychological Distress at baseline was higher (more Psychological Distress initially);
- Social Functioning improved (illness interfered less with life at middle);
- Negative change in Health Distress (less distressed about health at middle);
- Age was higher;
- Positive change in Self Efficacy (more self efficacious at middle); and
- Positive change in Satisfaction with Life score (more satisfied with life at middle).

The final  $R^2$  increased to 0.552, indicating that 55% of the improvement in Psychological Distress could be explained by this combination of factors.

#### 4.5.5.3 Prediction of Improvement in Health Distress

To identify the factors, known at the middle point, which predict improvement in Health Distress, a stepwise analysis was undertaken from which three significant variables were identified (in order of inclusion):

- Health Distress at baseline;
- Change in General Health; and
- Change Self Efficacy.

The results of this analysis are shown in Table 97 and Table 98.

**Table 97 Summary multivariate model for the prediction of improvement in Health Distress**

R	R Square	Adjusted R Square	Std. Error of the Estimate	R Square Change	Change Statistics			Sig. F Change
					F Change	df1	df2	
.580 <sup>a</sup>	.336	.331	.50912	.336	59.614	3	353	.000

- a. Predictors: (Constant), Self Efficacy – baseline to middle, Health Distress – baseline mean, General Health – baseline to middle  
 b. Dependent Variable: Health Distress – baseline to middle

**Table 98 Predictive coefficients for the improvement in Health Distress**

	Unstandardised Coefficients		Standardised Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	-.311	.061		-5.135	.000
Health Distress – baseline to middle	-.293	.024	-.520	-11.972	.000
General Health – baseline to middle	.173	.037	.209	4.728	.000
Self Efficacy – baseline to middle	-.026	.013	-.087	-1.963	.050

- a. Dependent Variable: Health Distress – baseline to middle

#### Summary of results

The predicted reduction in Health Distress between baseline and the middle measurement point was greater if:

- Health Distress at baseline was higher (more Health Distress initially);
- Negative change in the General Health score (i.e. improved General Health) from baseline to middle; and
- Positive change in Self Efficacy from baseline to middle (more self efficacious).

The final  $R^2$  increased to 0.366, indicating that 36.6% of the improvement in Health Distress could be explained by this combination of factors.

#### 4.5.5.4 Prediction of improvement in Social Functioning

To identify the factors, known at the middle point, which predict improvement in Social Functioning, a stepwise analysis was undertaken from which four significant variables were identified (in order of inclusion):

- Social Functioning at baseline;
- Change in Psychological Distress;
- Change in Self Efficacy; and
- Sex.

The results of this analysis are shown in Table 99 and Table 100.

**Table 99 Summary multivariate model for the prediction of improvement in Social Functioning**

R	R Square	Adjusted R Square	Std. Error of the Estimate	R Square Change	Change Statistics			Sig. F Change
					F	df1	df2	
.611 <sup>a</sup>	.373	.366	7.13294	.373	48.240	4	324	.000

- a. Predictors: (Constant), Self Efficacy – baseline to middle, Social Functioning – baseline mean, Psychological Distress – baseline to middle  
 b. Dependent Variable: Social Functioning – baseline to middle

**Table 100 Predictive coefficients for the improvement in Social Functioning**

	Unstandardised Coefficients		Standardised Coefficients		t	Sig.
	B	Std. Error	Beta			
(Constant)	-1.083	1.737			-.623	.533
Social Functioning – baseline to middle	-.283	.024	-.518		-11.738	.000
Sex	1.852	.856	.096		2.164	.031
Psychological Distress – baseline to middle	.313	.059	.241		5.265	.000
Self Efficacy – baseline to middle	-.556	.203	-.125		-2.740	.006

- a. Dependent Variable: Social Functioning – baseline to middle

#### Summary of results

The predicted improvement in Social Functioning between the baseline and middle measurement point was greater if:

- Social Functioning at baseline was worse (i.e. illness interfered more with life initially);
- Negative change in Psychological Distress from baseline to middle (i.e. less Psychological Distress);
- Positive change in Self Efficacy from baseline to middle (more self efficacious); and
- Sex was female.

The final  $R^2$  increased to 0.373, indicating that 37.3% of the improvement in Social Functioning could be explained by this combination of factors.

### **Overall summary of results**

Whilst the univariate analysis indicated that there was an overall improvement in the whole group as a consequence of the SHCI, the analysis presented above indicates that the improvement was not universal. A substantial proportion of clients reported no change or some deterioration. However, where greatest improvement was observed, a small set core of variables were important predictors of change for example, Self Efficacy, Social Functioning, Kessler 10, although not, interestingly, Intervention Model. This analysis also confirmed the finding from the univariate analysis which indicated that those who improved most were worst off at baseline.

Whilst the regression equations functioned efficiently in predicting improvement, explaining substantial proportions of the observed variance, this was not the case for those who did not change/deteriorate. This is a limitation of the evaluation in that it was not able to measure everything, for example:

- Clinical assessments; and
- Impact of other life events on self reported health status.