

Statistical summary of the change in Beck Scores between the start and finish of each Woodlands Trust group course for those gambler clients who finish the course and provide both initial and final Beck scores (All 2004 to 2011 Woodlands Trust group courses)

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Executive summary

There were 240 clients who attended Woodlands Trust group courses in the period 2004 to 2011 and who provided Beck scores at the start and finish of their courses (there were also a small number of such clients who attended one-day educational seminars, but these have been excluded from the analyses in this report). This report summarises the change in each Beck score between the start and finish of the group courses for these 240 clients.

- 89% of these clients reduced their BDI score between the start and finish of the course.
- The average reduction in BDI score was 52%, with the average BDI score reducing from 19.7 to 9.5.
- At the start of the course, 48% of clients had “moderate” or “severe” BDI scores, while by the end of the course this had reduced to 15%.
- 71% of clients reduced their BAI score between the start and finish of the course.
- The average reduction in BAI score was 36%, with the average BAI score reducing from 11.3 to 7.2.
- At the start of the course, 26% of clients had “moderate” or “severe” BAI scores, while by the end of the course this had reduced to 13%.
- 70% of clients reduced their BHS score between the start and finish of the course.
- The average reduction in BHS score was 38%, with the average BHS score reducing from 6.8 to 4.2.
- At the start of the course, 32% of clients had “moderate” or “severe” BHS scores, while by the end of the course this had reduced to 15%.

In general, those clients with the worst Beck scores showed the most improvement in the scores between the start and finish of the course. For more information on this aspect of the data, go to sections 4 and 5 of the report below.

METHOD

For those gambler clients who finish a course and provide both initial and final Beck scores, the change in each Beck score (BDI, BAI and BHS) between start and finish is now summarised in several ways, as follows:

1. The changes in score between the start and finish of the courses are classified into “reductions” (good), no change, and increases (not good), and counted.
2. The 95% Confidence Interval (95% CI) is calculated for the mean reduction in each score between the start and finish of the courses (averaged over all 240 gambler clients).
3. Each Beck score is classified into groups as follows:

BDI

0 – 13	Minimal
14 – 19	Mild
20 – 28	Moderate
29 – 63	Severe

BAI

0 – 7	Minimal
8 – 15	Mild
16 – 25	Moderate
26 – 63	Severe

BHS

0 – 3	Minimal
4 – 8	Mild
9 – 14	Moderate
15 – 20	Severe

The number of clients in each category at the start of the course is calculated and compared to the number of clients in each category at the finish of the course.

4. The fate of each client is also tracked more precisely by calculating the number of clients who change from e.g., “severe” to “mild” on the BDI score (and so on).
5. For each client, the reduction in each score is plotted against the initial score, and a line of best fit put through the data (this line is restricted to pass through the origin).

RESULTS

1. The changes in Beck scores between the start and finish of the group courses are classified into “reductions” (good), no change, and increases (not good), and counted. The percentage of clients who reduced their score is also given.

	Value	BDI	BAI	BHS
Score increased	Not good	17	51	47
Zero change	Neutral	9	18	26
Score reduced	Good	214	171	167
TOTAL		240	240	240
% reducing	Good	89%	71%	70%

Overall, 89% of gambler clients reduced their BDI score, while more than two thirds reduced their BAI and BHS scores.

2. For each Beck score, the mean initial score, the mean final score, and the 95% confidence interval (95% CI) for the mean reduction in score between the start and finish of the group courses (averaged over the 240 gambler clients who finished courses in the 2004 to 2011 period and who completed both tests) are as follows:

	BDI	BAI	BHS
Mean initial score	19.7	11.3	6.8
Mean final score	9.5	7.2	4.2
Mean reduction in score	10.2	4.1	2.6
95% confidence interval for mean reduction in score	±1.2	±1.0	±0.5

Summary: The BDI, BAI and BHS scores significantly reduced between the start and finish of the treatment course, when averaged over all 240 gambler clients who finished courses and did Beck tests both at the start and finish of their course, in the 2004 to 2011 period. On average, the BDI scores were reduced by 52% ($p < 0.001$), the BAI scores were reduced by 36% ($p < 0.001$), and the BHS scores were reduced by 38% ($p < 0.001$).

3. For each Beck score, the number of clients in each category (minimal, mild, moderate, severe, as defined on page 2) at the start of the course is calculated and compared to the number of clients in each category at the finish of the course. Results are:

BDI	<i>Initial score</i>	<i>Final score</i>	<i>% moderate or severe</i>
Minimal	78	179	
Mild	46	24	
Moderate	66	26	
Severe	50	11	<i>48% reduced to 15%</i>

BAI	<i>Initial score</i>	<i>Final score</i>	<i>% moderate or severe</i>
Minimal	98	163	
Mild	79	46	
Moderate	41	19	
Severe	22	12	<i>26% reduced to 13%</i>

BHS	<i>Initial score</i>	<i>Final score</i>	<i>% moderate or severe</i>
Minimal	86	144	
Mild	77	60	
Moderate	54	26	
Severe	23	10	<i>32% reduced to 15%</i>

4. The fate of each client is now tracked more precisely by calculating the number of clients who change from e.g., “severe” to “mild” on the BDI score (and so on). Results are:

		<i>Final BDI score</i>			
		Minimal	Mild	Moderate	Severe
<i>Initial BDI Score</i>	Minimal	77	0	1	0
	Mild	40	5	0	1
	Moderate	43	8	12	3
	Severe	19	11	13	7

		<i>Final BAI score</i>			
		Minimal	Mild	Moderate	Severe
<i>Initial BAI Score</i>	Minimal	88	7	2	1
	Mild	53	18	6	2
	Moderate	17	16	5	3
	Severe	5	5	6	6

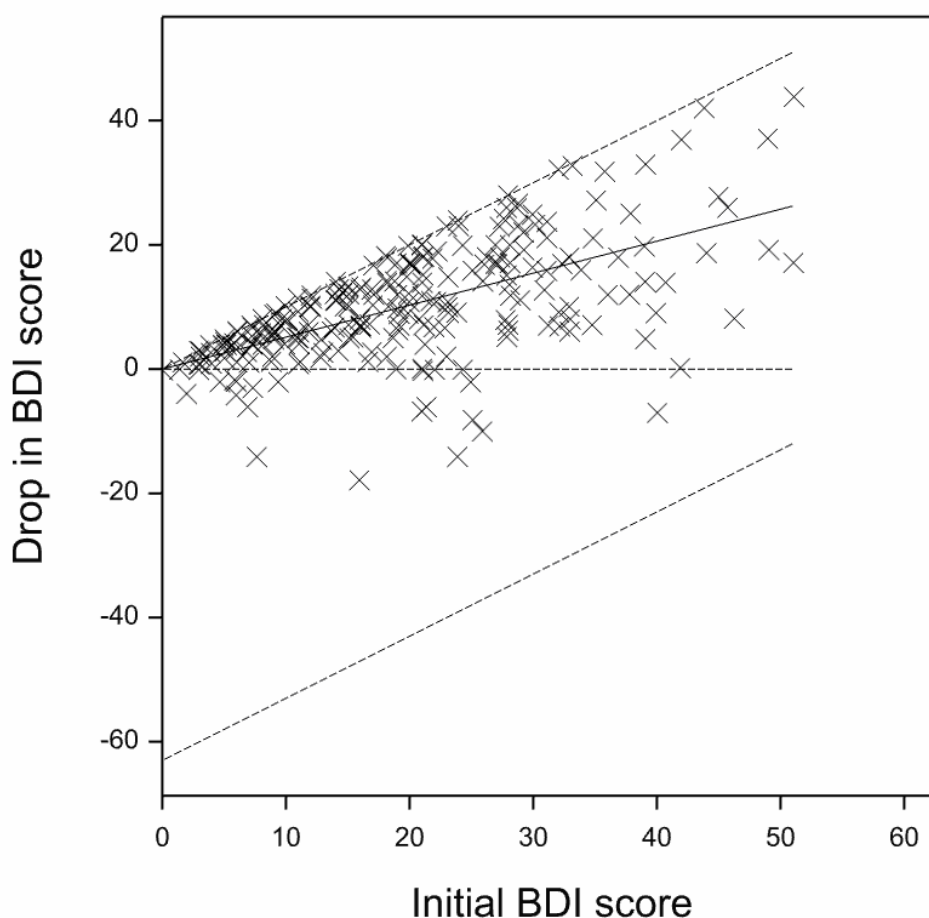
		<i>Final BHS score</i>			
		Minimal	Mild	Moderate	Severe
<i>Initial BHS Score</i>	Minimal	78	7	1	0
	Mild	45	21	11	0
	Moderate	18	25	8	3
	Severe	3	7	6	7

To interpret each table, note that:

- clients who lie on the main diagonal (**bolded**) represent “no change in category” (e.g., for BDI, this is $77 + 5 + 12 + 7 = 101$ clients)
- clients who lie on the diagonal immediately *below* the main diagonal had “scores improved by one category” (e.g., for BDI, this is $40+8+13= 61$ clients)
- clients who lie on the diagonal *two below* the main diagonal had “scores improved by two categories” (e.g., for BDI, this is $43 + 11 = 54$ clients)
- clients in the bottom left cell of the table had “scores improved by three categories” (e.g., for BDI, this is 19 clients)
- clients who lie on the diagonal immediately *above* the main diagonal had “scores deteriorated by one category” (e.g., for BDI, this is $0+0+3 = 3$ clients)
- clients who lie on the diagonal *two above* the main diagonal had “scores deteriorated by two categories” (e.g., for BDI, this is $1 + 1 = 2$ clients)
- clients in the top right cell of the table had “scores deteriorated by three categories” (e.g., for BDI, this is 0 clients)

5. For each Beck score, the reduction in score is plotted against the initial score for all 240 gambler clients, and a “line of best fit” plotted through the data (solid line). This line is restricted to pass through the origin in each case. (Note that to make the 240 points more visible on the graph, a small amount of random noise has been added to each of the x and y values. If this had not been done, there would be less than 240 points showing on the graph, with an unknown number of repetitions of each point.)

(a) BDI scores



In words, those clients with the highest initial BDI scores had the most potential for reduction, and the *solid line* on the graph shows that on average they did reduce more than clients with low initial BDI scores.

To further interpret this graph, the upper and lower dashed lines indicate the bounds for the data. The *upper line* indicates the *maximum improvement* that a client can achieve, given their initial BDI score. For example, a client with an initial BDI score of 2 can only improve by a maximum of 2 units (down to 0), while a client with an initial BDI score of 36 can improve by a maximum of 36 units (down to 0).

The *lower line* indicates the maximum amount by which a client's score can *deteriorate*, given their initial BDI score. BDI scores must lie within the range 0 (perfect) to 63 (worst possible), so the maximum deterioration for a client with an initial BDI score of "b" is $(63-b)$. For example, a client with an initial BDI score of 2 can deteriorate by a maximum of $(63-2) = 61$ units (up to 63), while a client with an initial BDI score of 36 can only deteriorate by a maximum of $(63-36) = 27$ units (up to 63).

The *horizontal dashed line* at "y=change in BDI=0" is the boundary between clients who improved in BDI score during the course and those who deteriorated in BDI score during the course. As tabulated in section 1 above, there are 9 clients on this line of no change, 214 clients whose scores improved (these are above the line $y=0$), and 17 clients whose scores deteriorated (these are below the line $y=0$).

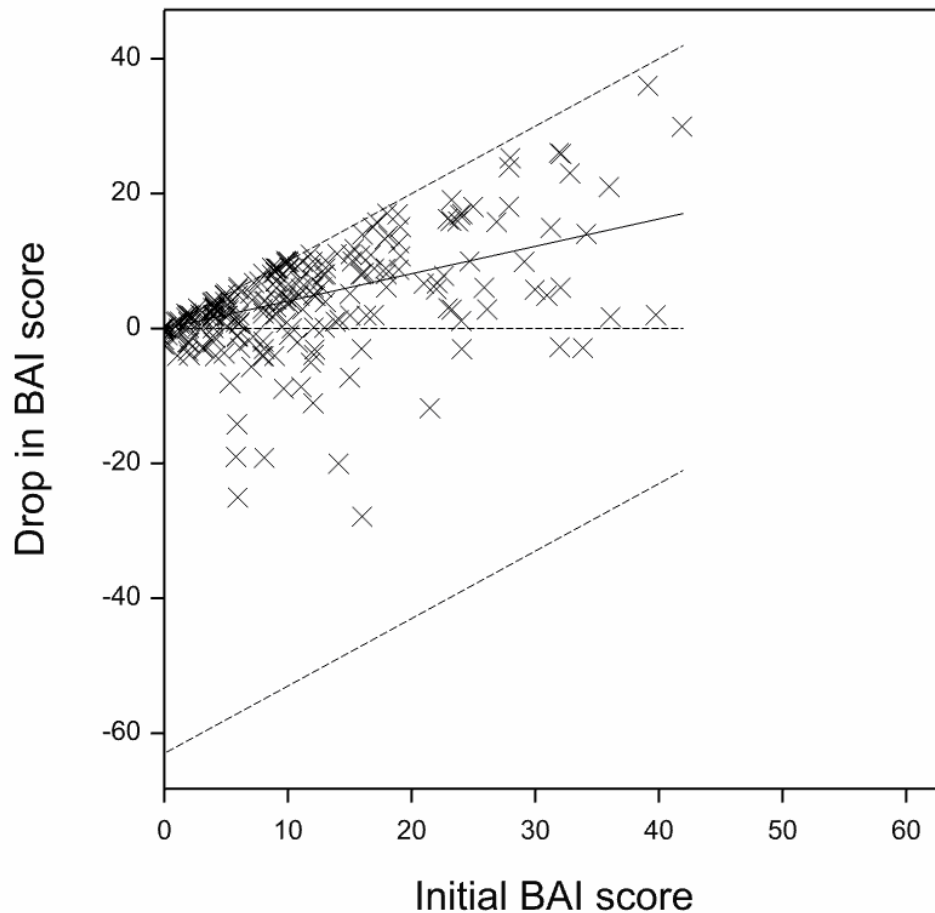
Note that if the courses had been totally *ineffective*, the above graph would be a “<” shape centred on the horizontal line $y=0$, since positive and negative changes in score would be roughly equal in number. If the courses had a positive effect for *all* clients, then all points would be above the line $y=0$ (i.e., all scores reduce, with no increases in score). In the graph shown above, most points are above the line $y=0$, reflecting the fact that the BDI score improved for 89% of clients.

In the extreme hypothetical case that all final BDI scores are zero (course was *100% effective* for all clients), then all of the points would lie on the 1:1 line through the origin (upper dashed line with slope=1). To get an estimate of the percentage effectiveness (as an average over the clients), the line of best fit was constrained so that it passed through the origin. The estimated slope of the line was 0.515, suggesting that the *percentage effectiveness* of the courses in terms of reducing BDI score was 51.5%.

Details of fitted regression line shown on graph

- The *equation* of the fitted line is:
(Reduction in BDI score) = 0.515 x (Initial BDI score)
- The slope of this line is significantly different from zero at the 0.1% level of statistical significance.

(b) BAI scores

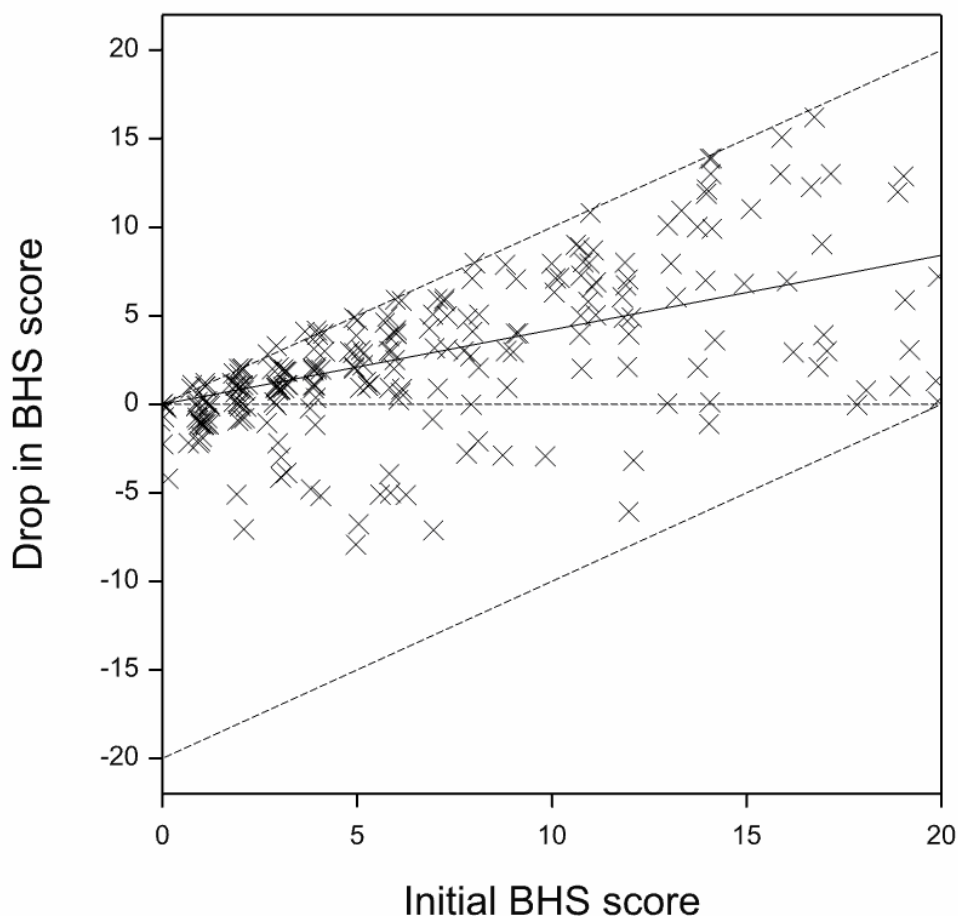


The corresponding graph for BAI scores is shown above. The interpretation is similar to that for BDI scores. The maximum possible BAI score is again 63. As detailed in section 1 and as shown in the above graph, 71% of clients had a drop in BAI score during their course. As a measure of the average magnitude of the drop in BAI score in percentage terms, the estimated slope of the line through the origin was 0.406, suggesting that the *percentage effectiveness* of the courses in terms of reducing BAI score was 40.6%.

Details of fitted regression line shown on graph

- The *equation* of the fitted line is:
(Reduction in BAI score) = 0.406 x (Initial BAI score)
- The slope of this line is significantly different from zero at the 0.1% level of statistical significance.
- In words, those clients with the highest initial BAI scores had the most potential for reduction, and the graph shows that on average they *did* reduce more than clients with low initial BAI scores.

(c) BHS scores



The corresponding graph for BHS scores is shown above. The interpretation is similar to that for BDI scores, except that the maximum possible BHS score is 20. As detailed in section 1 and as shown in the above graph, 70% of clients had a drop in BHS score during their course. As a measure of the average magnitude of the drop in BHS score in percentage terms, the estimated slope of the line through the origin was 0.421, suggesting that the *percentage effectiveness* of the courses in terms of reducing BHS score was 42.1%.

Details of fitted regression line shown on graph

- The *equation* of the fitted line is:
(Reduction in BHS score) = 0.421 x (Initial BHS score)
- The slope of this line is significantly different from zero at the 0.1% level of statistical significance.
- In words, those clients with the highest initial BHS scores had the most potential for reduction, and the graph shows that on average they *did* reduce more than clients with low initial BHS scores.